

# Snow Water Lake and Warm Creek Allotments Grazing Permit Renewal

Standards and Guidelines for Rangeland Health  
Assessment



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BLM  
NEVADA Elko District, Wells Field Office



It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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**Cover photo: East Humboldt Mountains as reflected in Snow Water Lake by Jeff Moore, Rangeland Management Specialist**

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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## NORTHEASTERN GREAT BASIN STANDARDS AND GUIDELINES ASSESSMENT SNOW WATER LAKE AND WARM CREEK ALLOTMENTS 2012

Elko District BLM  
Wells Field Office

### **I. Introduction**

The Bureau of Land Management (BLM) grazing regulations at 43 CFR 4130.3-1(c) require that grazing permits issued by the BLM contain terms and conditions that ensure conformance with BLM regulations at 43 CFR 4180, which are the regulations under which the Northeastern Great Basin Resource Advisory Council developed the *Northeastern Great Basin Standards and Guidelines for Grazing Administration* (RAC, 1997). Recently, the Wells Field Office completed an assessment of the achievement of these standards on the Snow Water Lake and Warm Creek Allotments. The results of this assessment are presented in this report. This assessment will serve to inform the BLM's determination as to whether these standards are being met, and, if they are not met, whether existing grazing management practices contribute to their lack of attainment.

The approved standards for rangeland health are as follows:

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, 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 life cycle requirements of threatened and endangered species.

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

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.

This assessment will assess Standards 1-4 only. Standard 5 is not applicable on these allotments because they are not located within Herd Management Areas.

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## II. Allotment Descriptions

The Snow Water Lake and Warm Creek Allotments are located approximately twenty-five miles south of Wells, Nevada. The Snow Water Lake Allotment contains approximately 18,049 acres of public land administered by the BLM and 4,317 acres of private land, while the Warm Creek Allotment contains 1,537 acres of public land administered by the BLM. Map 1 displays the location of these two allotments.

The Warm Creek Allotment sits on the alluvial fan on the east side of the East Humboldt mountain range, while the Snow Water Lake Allotment spans the lower portions of the fan and a portion of the valley bottom. Snow Water Lake, an ephemeral water body that is the last remnant of Lake Clover, a Pleistocene-era lake, dominates much of the valley floor portion of the Snow Water Lake Allotment. The lake is currently fed by a number of sloughs originating at a major spring complex on private land within the allotment, supplemented by ephemeral drainages flowing off the East Humboldt Range. Elevations on the two allotments range from a little over 6,200 feet at the highest points of the Warm Creek Allotment to slightly less than 5,600 feet in the lakebed on Snow Water Lake Allotment.

The Snow Water Lake Allotment is currently divided into five pastures. Pastures A, B, and C are located on the west side of Highway 93, while the Creek and Lake pastures lie on the east side of the highway. No internal fencing exists within the Warm Creek Allotment. Map 2 displays the current land ownership, roads, pastures, existing range improvements, and water locations.

Pastures A, B, and C of the Snow Water Lake Allotment are seeded partially to entirely with crested wheatgrass, though sagebrush and some native forbs and grasses have recolonized those pastures. The Creek and Lake Pastures are native pastures supporting a mostly alkaline/sodic plant community of greasewood, rabbitbrush, Great Basin wildrye, alkali sacatonwildrye, alkali sacaton, and native wheatgrasses. The Warm Creek Allotment supports mostly native vegetation consisting of black sage, big sagebrush, bluebunch wheatgrass, Indian ricegrass, needle and thread grass, and patches of antelope bitterbrush. Utah juniper is encroaching into the sagebrush habitat in the southern end of the Warm Creek Allotment and in Pastures B and C of the Snow Water Lake Allotment.

There are no lotic perennial riparian areas on either allotment. Several lentic springs and seeps exist on the Snow Water Lake allotment. No known threatened or endangered species, or their habitat, exist on public land within either allotment. However, an endangered species of dace is found in the Warm Springs complex which is located entirely on private land. Wildlife values present on the two allotments consist of deer and antelope habitat, Greater Sage-Grouse habitat, and habitat for a variety of non-game species. One recent fire, the 2001 Egbert fire, affected portions of both allotments.

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## III. Grazing History and Current Grazing Management

The Warm Creek Ranch, which currently serves as the base property associated with the grazing privileges on both allotments, has a long history of ranching and agricultural production. Water rights applications on file with the State of Nevada-Department of Water Resources associated with Jerry Crab Spring, a spring lying within the U.S. Forest Service lands above the Warm Creek Allotment, show water first being delivered from the spring through irrigation ditches to what is now the ranch headquarters prior to 1881, with the first mentions of buildings, agricultural fields, and domestic water uses occurring in the 1884/1885 time period. Files documenting adjudication of the forage available on public lands in the mid-1940s credit the ranch with an average of 247 cows for six months, though one document also states the ranch also supported 2,000 sheep “run out west of Warm Creek”. The file also references extensive use of the valley around Snow Water Lake by tramp sheep operations in the years prior to passage of the Taylor Grazing Act.

A range condition and trend study document prepared by the BLM in 1956 states, in part, “*The range in bad condition is located adjacent to the Warm Springs Ranch and Tobar. For numerous years these two areas had extremely heavy use which resulted in a severe infestation of Halogeton. At the present time there is very little grass in these areas and the vegetation is composed primarily of sagebrush, rabbit brush, salt brush, Halogeton and a few annuals*”. The BLM planted the crested wheatgrass seedings that now provide most of the herbaceous vegetation in Pastures A, B, and parts of Pasture C in the Snow Water Lake Allotment in the 1960’s to stabilize these sites, suppress halogeton infestations, and re-introduce herbaceous vegetation into areas depleted by historic livestock use.

The Elko District completed an allotment evaluation for the Snow Water Lake Allotment in 1988 and signed a grazing agreement implementing the actions proposed in the evaluation on 19 August 1988. The Elko District completed an allotment evaluation for the Warm Creek Allotment in 1989 and issued a Final Multiple Use Decision implementing the actions proposed in the evaluation on 20 October 1992. The Elko District signed a new grazing agreement on 13 September 2001 that replaced the grazing systems on each allotment with a new integrated grazing system incorporating both allotments. In 2002, the Elko District issued a Draft Standards and Guides for Rangeland Health Assessment concluding that existing management resulted in the attainment of all standards.

Table 1 lists the allotment, grazing preference, season of use, and kind of livestock permitted on the Snow Water Lake and Warm Creek Allotments.

| <b>Table 1. Summary of animal unit months (AUMs), season of use, and kind of livestock</b> |                |                                  |                      |                          |
|--|----------------|----------------------------------|----------------------|--------------------------|
| <b>Allotment Name</b>  | <b>Pasture</b> | <b>Grazing Preference (AUMs)</b> | <b>Season of Use</b> | <b>Kind of Livestock</b> |
| Snow Water Lake  | --             | 723                              | 3/1-7/11             | Cattle                   |
| Snow Water Lake  | --             | 381                              | 11/1-12/31           | Cattle                   |
| Warm Creek   | --             | 118                              | 4/13-7/11            | Cattle                   |

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Table 2 shows the current grazing system prescribed by the 2001 agreement.

| <b>Table 2: 2001 Grazing Agreement</b> |                   |                   |                   |
|--|-------------------|-------------------|-------------------|
| Pasture                                | Year 1            | Year 2            | Year 3            |
| B                                      | 3/1-4/12          | 3/1-4/12          | 3/1-4/12          |
| Warm Creek                             | 4/13-4/30         | 6/24-7/11         | 5/10-5/27         |
| A                                      | 5/1-6/14          | 4/13-5/27         | 5/28-7/11         |
| C                                      | 6/15-7/11         | 5/28-6/23         | 4/13-5/9          |
| <i>Private Ground</i>                  | <i>7/12-10/31</i> | <i>7/12-10/31</i> | <i>7/12-10/31</i> |
| Creek                                  | 11/1-11/30        | 11/1-11/30        | 12/1-12/31        |
| Lake                                   | 12/1-12/31        | 12/1-12/31        | 11/1-11/30        |

## IV. Monitoring Data Summary

### A. Actual Use Summary

Actual use data has been provided by permittee by allotment during most grazing years since 1983. This data is provided in Appendix 1.

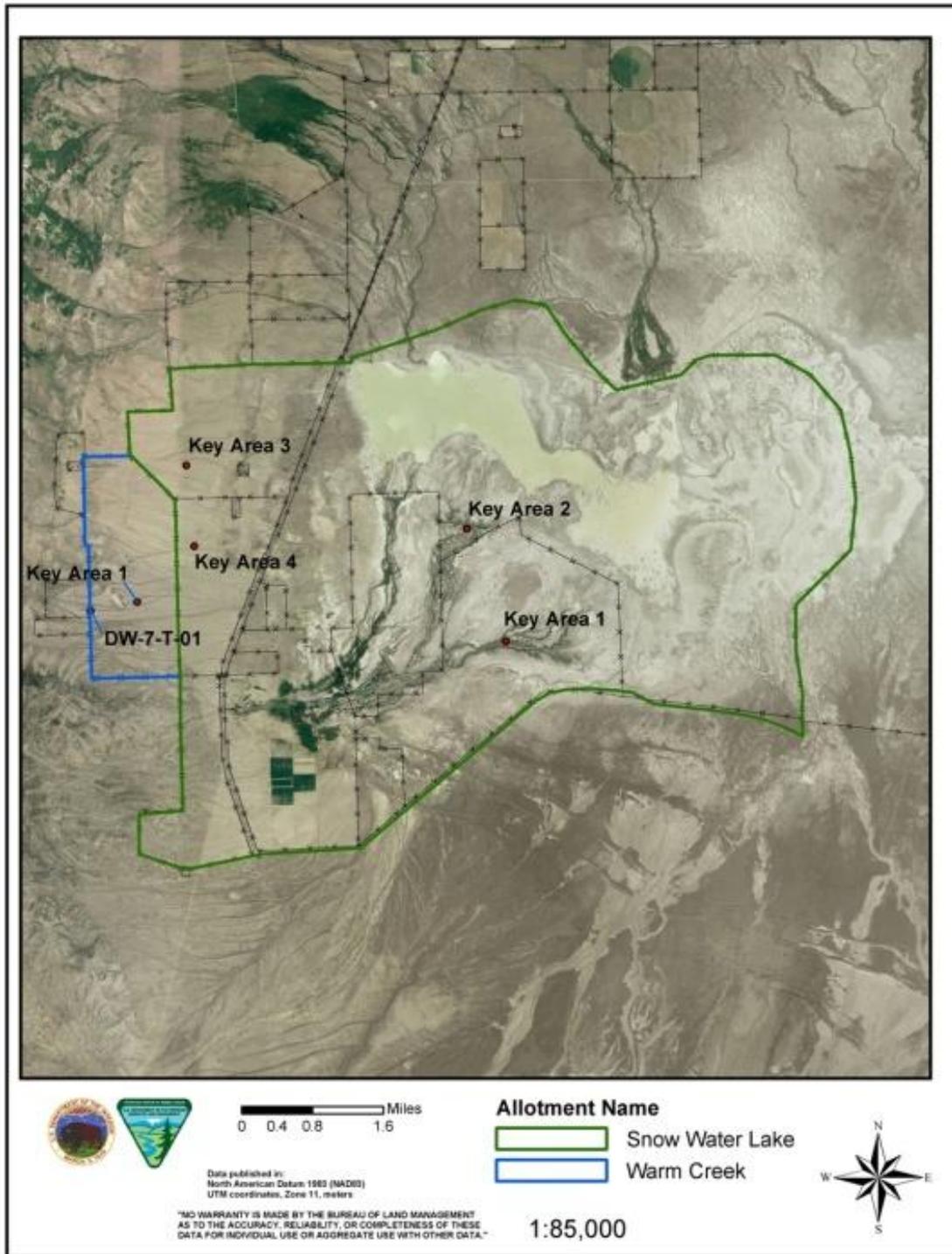
### B. Key Area Utilization

A key area is a relatively small portion of a pasture selected as a point to monitor change in vegetation or soil and the impacts of management. A key area is intended to reflect current management over similar important areas in the pasture. The BLM has established four range key areas in the Snow Water Lake Allotment, one range key area in the Warm Creek Allotment, and one wildlife key area in the Warm Creek Allotment. A summary of the annual utilization results for the two allotments is found in Appendix 2. See Figure 1 for key area locations.

### C. Use Pattern Maps

Use pattern maps indicate the degree and pattern of use on key forage species by all grazing animals on all or parts of an allotment. Use pattern data can then be used to identify distribution problems which can be dealt with during adjustments to the management plan. Use pattern data can also be used in calculating grazing capacities. Use pattern maps are available for the Snow Water Lake and Warm Creek Allotments; however, none of these have been compiled since the implementation of the 2001 grazing agreement. The use pattern maps completed on these two allotments are available for review at the Wells Field Office but will not be referenced further in this document because of their limited applicability to the existing management situation.

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**Figure 1: Key Area Locations**

## **D. Trend (Frequency)**

Frequency measures the change in the presence or absence of a plant species in the community over time. Long-term frequency data collected was collected between 1983 -2011 at all four key

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areas on the Snow Water Lake Allotment and 1984-2011 at the range key area in the Warm Creek Allotment.

Frequency data for the Snow Water Lake Allotment shows that the plant community at Key Area #1 has undergone radical shifts in makeup over the evaluation period. This site sits in the seasonally flooded sloughs east of the ranch. The 1988 allotment evaluation attributed the dramatic changes in the key area observed between 1983 and 1987 to the exceptionally high moisture regime experienced during those years, which caused Snow Water Lake- and the water table in the sloughs- to rise to the highest levels observed in recent history. The site appears to have been in a drying trend since, which may be partly due to lower water levels in Snow Water Lake; however, a review of aerial photography between 1995 and the present shows a major change in water management on the private lands has taken place, as a lot of the runoff that used to flow east into the sloughs running through Key Area #1 now flows into other sloughs running to the north, resulting in this site becoming much drier than it was in the late 1980's and early 1990's. Of particular note is the near complete disappearance of Western wheatgrass (AGSM) from the key area, though the plant is still very common in the immediate vicinity of the key area, especially in the black greasewood plant communities found outside of the slough bottoms in which the key area is located. Similar shifts in the plant community have been observed at Key Area #2, which was underwater during much of the middle- to later- 1980's when the lake reached its recent historic high level. The plant communities in both of these areas seem to be far more influenced by seasonal flooding, runoff events, and management of the water on the private lands than livestock management. Frequency data collected at Key Areas #3 and #4 in the Snow Water Lake Allotment and the range key area in the Warm Creek Allotment have shown generally stable plant communities, though in some cases, there were significant increases or decreases in certain key forage species. The most recent review of the frequency data for the Snow Water Lake and Warm Creek Allotments can be found in Appendix 3. Photographs of the frequency transects for all key areas are contained in Appendix 7.

## **E. Weight-Estimate Production Data**

Weight-estimate production data determines the production at a site in relation to its site potential and from this information, ecological condition is determined. Weight-estimate production data and ecological condition determinations have been completed on the Snow Water Lake Allotment between 1983-2011 and the Warm Creek Allotment between 1984-2011.

A summary of the production data for the Snow Water Lake and Warm Creek Allotments can be found in Appendix 4.

## **F. Point Cover Data**

BLM has collected point cover data on the two allotments. In 2002, BLM collected point cover data using a "step point" method at Key Areas #3 and #4 on the Snow Water Lake Allotment and the range key area on the Warm Creek Allotment. Cover data was again collected in 2011 at all five range key areas in the Snow Water Lake and Warm Creek Allotments. The studies showed differences in cover values, but the variations in how BLM collected the data do not allow for any true comparisons to be made across the years. This information is summarized in Appendix 5.

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## **G. Interpreting Indicators of Rangeland Health**

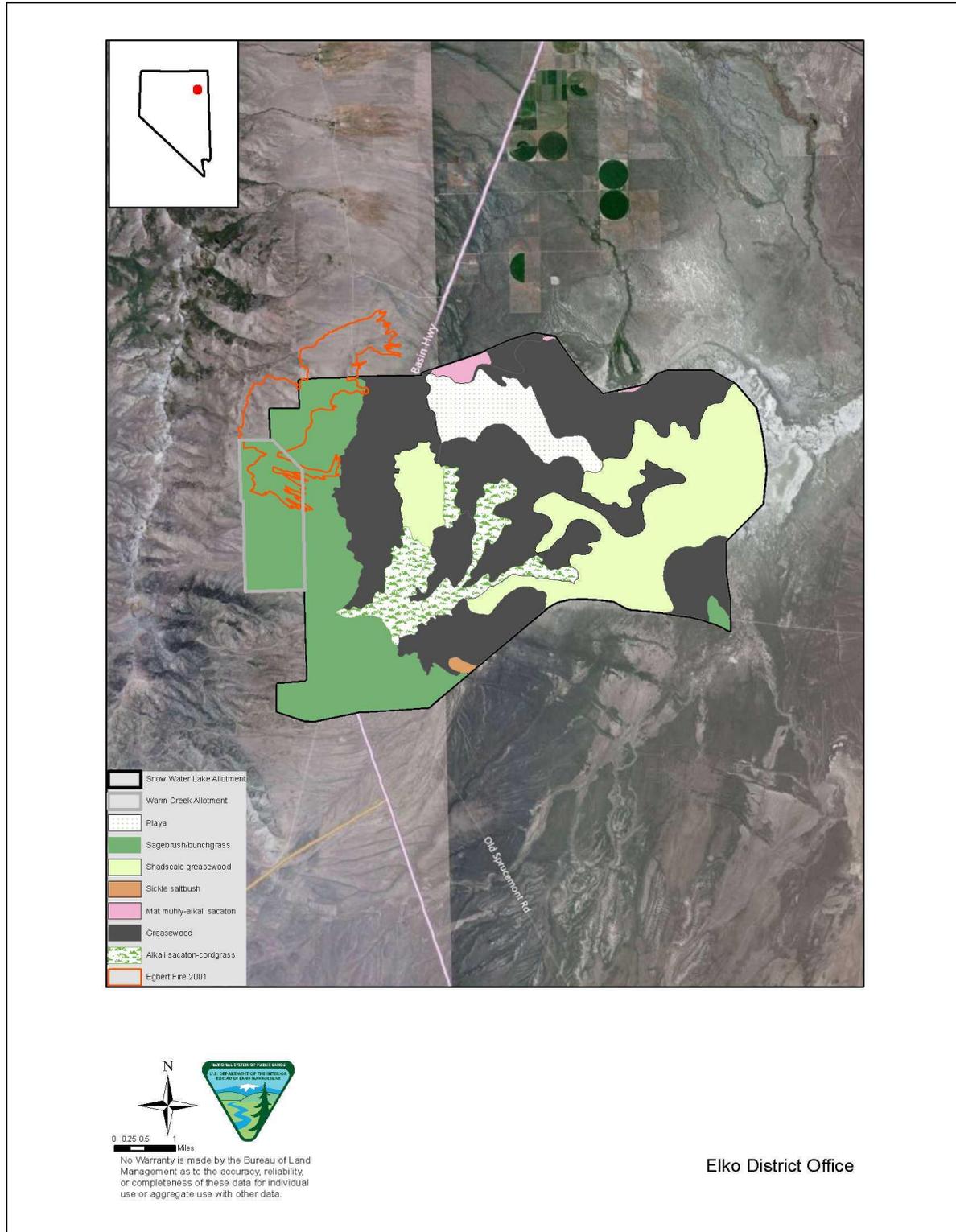
While collecting trend monitoring data in 2011, BLM personnel completed the first seventeen questions on the Interpreting Indicators of Rangeland Health evaluation sheet at the three key areas representing native plant communities (Key Areas #1 and #2 in the Snow Water Lake Allotment and the range key area in the Warm Creek Allotment). These worksheets show none to slight departures from expected for all indicators at the three key areas except for the Warm Creek Allotment, where two of the indicators received slight to moderate departures because of the lack of bunchgrasses. The worksheets are summarized in Appendix 6.

## **H. Wildlife Habitat**

### Warm Creek Allotment

Wildlife habitat within the Allotment is dominated by black sagebrush (*Artemisia nova*), with an herbaceous understory of cheatgrass (*Bromus tectorum*), needle and thread (*Hesperostipa comata*), Indian ricegrass (*Achnatherum hymenoides*), and a variety of forbs (see Figure 1). Additional habitat types found in smaller proportion include encroaching juniper woodland and 372 acres of perennial grasslands, containing a minor shrub component on the north end of the allotment. These grasslands are a result of BLM rehabilitation efforts following the Egbert wildfire in 2001. See Figure 2 for available mapping of potential natural vegetation communities.

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**Figure 2: Potential Natural Vegetation types within the Snow Water Lake and Warm Creek Allotments**

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The Nevada Department of Wildlife provided a comprehensive list of species that likely occur or have been documented within Hunt Units 101 and 105, which includes the Warm Creek and Snow Water Lake Allotments (2010; Appendix 8). This list included “Locally Extirpated” species, due to the fact that area habitat may have supported these species at one time.

A list of priority wildlife species was derived through consultation with NDOW and using the Nevada Comprehensive Bird Conservation Plan (BCP; GBBO 2010). The primary habitat type within the Allotment is sagebrush; therefore, to identify priority bird species we used the BCP habitat account for sagebrush (Table 3). In addition, NDOW suggested Loggerhead Shrike (*Lanius ludovicianus*), Bald Eagle (winter; *Haliaeetus leucocephalus*), Rough-legged Hawk (winter; *Buteo lagopus*) and Common Nighthawk (*Chordeiles minor*) as additional priority bird species for the area (Table 3). While the list is not comprehensive of all bird species that may use the allotment, by managing for conservation of a suite of priority species it is reasonable to conclude that habitat needs are met for the remainder of sagebrush-associated species. Non-avian priority species were determined in consultation with NDOW.

| Table 3. <sup>1</sup> Priority species for Warm Creek Allotment sagebrush habitat. Bird species were compiled using the sagebrush habitat account within the Nevada Comprehensive Bird Conservation Plan (GBBO 2010) and through consultation with the Nevada Department of Wildlife. Additional non-avian priority species were determined through consultation with NDOW.  |                                  |
|--|----------------------------------|
| Common name  | Scientific name                  |
| <sup>2</sup> Greater Sage-Grouse   | <i>Centrocercus urophasianus</i> |
| <sup>2</sup> Swainson’s Hawk   | <i>Buteo swainsoni</i>           |
| <sup>2</sup> Ferruginous Hawk  | <i>Buteo regalis</i>             |
| <sup>2</sup> Golden Eagle  | <i>Aquila chrysaetos</i>         |
| <sup>2</sup> Prairie Falcon  | <i>Falco mexicanus</i>           |
| <sup>2</sup> Burrowing Owl   | <i>Athene cunicularia</i>        |
| <sup>2</sup> Short-eared Owl   | <i>Asio flammeus</i>             |
| Sage Thrasher  | <i>Oreoscoptes montanus</i>      |
| Brewer’s Sparrow   | <i>Spizella breweri</i>          |
| Sage Sparrow   | <i>Amphispiza belli</i>          |
| Gray Flycatcher  | <i>Empidonax wrightii</i>        |
| Common Poorwill  | <i>Phalaenoptilus nuttallii</i>  |
| ( <sup>2</sup> Pinyon Jay)   | <i>Gymnorhinus cyanocephalus</i> |
| <sup>2,3</sup> Loggerhead Shrike   | <i>Lanius ludovicianus</i>       |
| <sup>2,3</sup> Bald Eagle  | <i>Haliaeetus leucocephalus</i>  |
| <sup>3</sup> Rough-legged Hawk   | <i>Buteo lagopus</i>             |
| <sup>3</sup> Common Nighthawk  | <i>Chordeiles minor</i>          |
| <sup>3</sup> Greater Short-horned Lizard   | <i>Phrynosoma hernandesi</i>     |
| <sup>2,3</sup> Pygmy Rabbit  | <i>Brachylagus idahoensis</i>    |
| <sup>3</sup> American Pronghorn  | <i>Antilocapra americana</i>     |
| <sup>1</sup> “Priority” refers to species in the Nevada Comprehensive Bird Conservation Plan that were determined to use the habitat type to a significant degree; it is not a specific BLM designation, but is useful for determining which species to focus on in a particular habitat type. Species listed in parentheses indicate that the bird uses the habitat occasionally, seasonally, or opportunistically, but is not primarily dependent upon it (GBBO 2010).<br><sup>2</sup> BLM Special Status Species.<br><sup>3</sup> Priority species suggested by NDOW. |                                  |

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## **Migratory Birds**

On January 11, 2001, Migratory Bird Executive Order 13186 “Responsibilities of Federal Agencies to Protect Migratory Birds” was issued. It directed executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act and to conserve migratory birds (the list of migratory birds can be found in 50 CFR 10.13). On 12 April 2010 the BLM entered into a Memorandum of Understanding (MOU) with the US Fish and Wildlife Service to promote the conservation of migratory birds. An example of a conservation measure in the MOU is to manage livestock to avoid impacts on nesting birds and to improve migratory bird habitat. Standard BLM grazing terms and conditions (e.g., maximum utilization levels, 1/4 mile minimum distance from mineral supplements to live water sources, etc.) are designed to minimize impacts to migratory bird populations and help promote their conservation. Several migratory bird species are included on the NDOW wildlife list for the area (Appendix 8).

## Special Status Species

Special Status Species are those plants or animals listed or proposed for listing as threatened or endangered under the Endangered Species Act of 1973, as Amended (ESA), species that are candidates for listing under the ESA, species that are listed by the State of Nevada and species that are on BLM’s list of Sensitive Species for Nevada. Under provisions of the ESA and BLM’s policy requirements (BLM Manual 6840, Special Status Species, Section .06, Rel. 6-1211, 2001), BLM is required to implement management plans that conserve special status species and their habitats and ensure that actions authorized, funded, or carried out by BLM do not contribute to species extinction (listed species) or to the need to become listed (candidate or sensitive species).

## *Eagles*

The Bald Eagle is a migrant and winter resident on the Allotment. Suitable winter habitat is widely dispersed on uplands, irrigated lands and riparian areas throughout the Elko District. On 9 July 2007, the Bald Eagle was removed from the list of Threatened and Endangered species. A Bureau sensitive species, the Bald Eagle continues to be protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act. Both Acts prohibit killing, selling, or otherwise harming eagles, their nests, or their eggs. The US Fish and Wildlife Service established 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. These documents and more information about the Bald and Golden Eagle are available on the Service’s website (<http://www.fws.gov/midwest/eagle/protect/DraftBAEAPDM.pdf>; <http://www.fws.gov/migratorybirds/baldeagle.htm>). The Golden Eagle is a year-round resident in the Warm Creek Allotment vicinity.

## *Other Raptors*

The Warm Creek Allotment provides potential nesting, wintering, and/or foraging habitat for other special status raptors, including but not limited to Ferruginous Hawk, Swainson’s Hawk, Rough-legged Hawk, Prairie Falcon, Burrowing Owl, and Short-eared Owl. Small mammals and jackrabbits in these habitats provide prey for raptors.

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## *Loggerhead Shrike*

In Nevada, loggerhead shrikes inhabit desert scrub, sagebrush rangelands, grasslands and meadows (NDOW 2006). Loggerhead shrikes often perch on poles, wires, or fenceposts; suitable hunting perches are an important part of habitat. Large insects, other invertebrates, small birds, lizards, frogs, and rodents provide prey within the allotment.

## *Greater Sage-Grouse*

Greater Sage-Grouse (Sage-Grouse), a candidate species, may utilize portions of the allotment. Approximately ¼ of the allotment lies within the 75% Breeding Density area described by Doherty et al. (2010). The nearest lek is located 1.4 miles southeast of the allotment, on privately owned land (Figure 5). Nine additional leks are located within 5.3 miles of the allotment (Table 4, Figure 5). This distance was chosen based on the size of nesting areas around leks in lower density and fragmented habitats in Doherty et al. (2010) and Holloran and Anderson (2005).

Table 4. Sage-Grouse leks within 5.3 miles of the Warm Creek Allotment. Data compiled from Nevada Department of Wildlife lek database, 2011.

| Lek               | Distance from Allotment (miles) | Last Active | Last survey | <sup>1</sup> Lek Status | Last # Males |
|-------------------|---------------------------------|-------------|-------------|-------------------------|--------------|
| Warm Creek 1      | 1.4                             | ?           | 2008        | Unknown                 | 0            |
| Wolverton         | 3.4                             | 1986        | 2008        | Unknown                 | 0            |
| S. Horse Creek    | 4.1                             | 2007        | 2011        | Unknown                 | 0            |
| S. Clover 3       | 4.4                             | 2011        | 2011        | Unknown                 | 7            |
| Curtis Spring NE  | 4.5                             | ?           | 2007        | Unknown                 | 0            |
| Wiseman 1         | 4.7                             | 2009        | 2009        | Unknown                 | 8            |
| S. Clover 2       | 4.7                             | 2002        | 2002        | Unknown                 | 8            |
| Warm Creek 2      | 4.7                             | 1986        | 2007        | Unknown                 | 0            |
| W. Arizona Spring | 4.8                             | 2007        | 2010        | Unknown                 | 0            |
| Snow Fence        | 4.8                             | 1986        | 2007        | Unknown                 | 0            |

<sup>1</sup> Lek Status definitions From NDOW (2004):

**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.

**Historic** - a lek that has not had bird activity for twenty years or more and has been checked according to protocol at

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least intermittently. Another means of classifying a lek as historic is to photograph a lek location (by a field biologist) and determine if the habitat is suitable for normal courtship displays. For example, if a lek location lies in a monotypic stand of sagebrush that is three to four feet tall, then conditions are no longer suitable for lekking activity.

**Note** - for active, inactive, and unknown status leks because of the sheer number of documented lek locations in the State of Nevada and the limited personnel available to visit all leks each year, the status applied to a lek through its most recent visitation will be upheld in subsequent years until the lek is revisited to verify its status.

While no specific monitoring for Sage-Grouse habitat condition was conducted within the Allotment, observations throughout the allotment combined with composition data from the two key areas indicated that there were no obvious deficiencies in the herbaceous understory cover or sagebrush canopy cover. Cheatgrass at Key Area DW-T-07-01 comprised ~30% of the total vegetative cover at the site. However, this key area was located on a bitterbrush site, and therefore is unlikely to be used for nesting by Sage-Grouse, which prefer sagebrush communities for nesting. Cheatgrass composition at Key Area KA-01, representative of sagebrush habitat throughout the Allotment, was less than 1%.

## *Pygmy Rabbit*

The pygmy rabbit is a BLM Sensitive Species petitioned for listing as threatened or endangered under the ESA. On May 20, 2005, the U.S. Fish and Wildlife Service announced a 90-Day finding in the Federal Register indicating that, "... the petition does not provide substantial information indicating that listing the pygmy rabbit may be warranted." The finding does not downplay the need to conserve, enhance or protect pygmy rabbit habitat. The sagebrush-bunchgrass habitat type is important for pygmy rabbits. Pygmy rabbits typically occur in areas supporting tall, dense sagebrush and deep friable soils required for excavating burrows. There is a single historical (pre-1946) record of pygmy rabbit at Jerry Crab Spring, about a half mile west of the allotment. The black sagebrush that comprises the majority of shrub-steppe vegetation on the allotment is not ideal habitat for pygmy rabbits, but is likely suitable to some degree.

## *Preble's Shrew*

Likely habitat associations for Preble's shrews (*Sorex preblei*) collected in northeastern Nevada were described as "ephemeral and perennial streams dominated by shrubs, primarily below 2,500 m in elevation" (Ports and George 1990). At Sheep Creek, ~55km north of Elko, Ports and George (1990) collected 12 specimens "in a seasonally wet, sagebrush-dominated community." Little else is known about the ecology and distribution of Preble's shrew in Nevada or its specific habitat needs. Given the brief description of habitat associations of Preble's shrews in northeastern Nevada, it is reasonable to expect that the species could occur within the allotment.

## *Dark Kangaroo Mouse*

The dark kangaroo mouse (*Microdipodops megacephalus*) is adapted to arid rangelands and can be found in areas of loose sands and gravel, but may occur in sand dunes near the margins of its range. Arthropods represent an important dietary component.

## *Bats*

Although no surveys for bats have been conducted, the allotment is likely important foraging habitat for many bat species, all of which are BLM Sensitive Species. Wetlands and surface water associated with springs, drainages, ephemeral wetlands, and sagebrush rangelands provide

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habitat for many bat species. Water sources are especially critical to bats because they drink from open water and because these areas provide an insect forage base. Healthy sagebrush and salt desert scrub habitats, as well as irrigated agricultural fields also provide a variety of insect forage for many bat species. Bats that are known or likely to occur within the allotment can be found in Appendix 8.

### Non-special status species

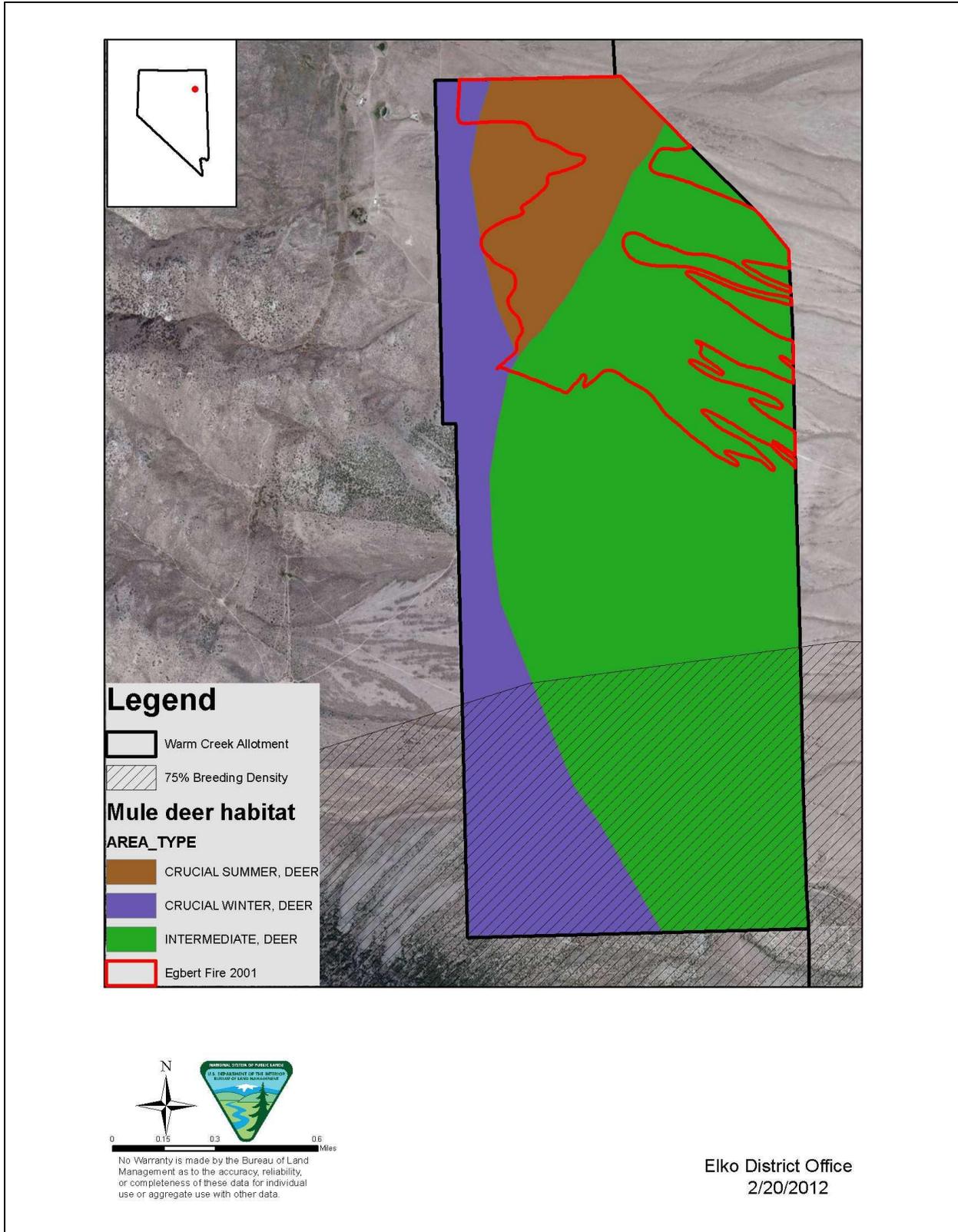
#### *Mammals – Big Game*

Twenty-two percent of the allotment is classified by NDOW as crucial winter habitat for mule deer (*Odocoileus hemionus*). One wildlife key area (#DW-7-T-01), located on the western border of the allotment (Figure 4), was established in 1985 to monitor utilization of bitterbrush and habitat conditions within crucial deer winter habitat (Appendix 9). The site was monitored during June, 2011, and was rated as good (Appendix 9). Prior year habitat ratings could not be determined because of lack of data; however, bitterbrush utilization measurements are presented in Appendix 9. One deficiency noted during monitoring was that the age class rating for bitterbrush was unsatisfactory because it lacked the seedling and young age classes (Appendix 9). Twelve percent and sixty-six percent of the allotment is classified as crucial summer and intermediate mule deer habitat, respectively.

Eighty-seven percent (1,339 ac) of the allotment is classified as yearlong pronghorn habitat (Figure 3). No key areas have been established specifically to monitor pronghorn habitat condition, but one key area (#4349-01; Figure 4) within pronghorn yearlong habitat was established to monitor impacts of livestock grazing management. Using data collected at this site in June 2011, the habitat rating for pronghorn was "good" (Appendix 9). However, one deficiency not noted on monitoring forms was the presence of fences that are not built to BLM wildlife-friendly specifications.

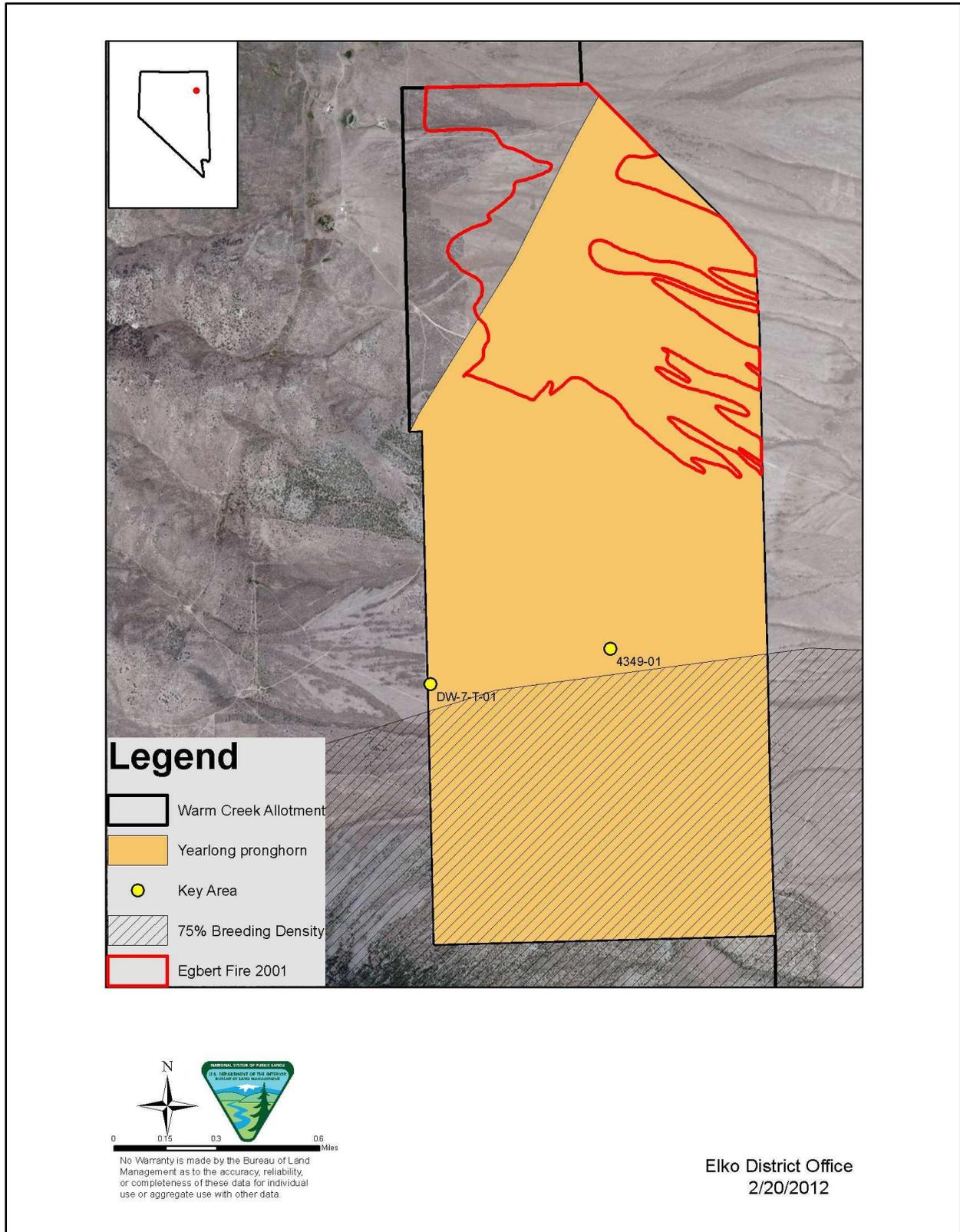
Rocky Mountain elk (*Cervus elaphus*) may make minimal use of the allotment. Bighorn sheep (*Ovis canadensis*) do not use the allotment, nor does it contain habitat that they would be expected to begin using. It is unknown how much, if any, use of the allotment is made by mountain lions (*Puma concolor*).

# Snow Water Lake and Warm Creek Allotments S&G Assessment



**Figure 3.** Mule deer habitat designations and Greater Sage-Grouse 75% Breeding Density overlap within the Warm Creek Allotment, Elko District BLM, Wells Field Office.

# Snow Water Lake and Warm Creek Allotments S&G Assessment



**Figure 4.** Pronghorn habitat and locations of key areas within the Warm Creek Allotment, Elko District BLM, Wells Field Office.  
*Amphibians and Reptiles*

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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The Greater Short-horned Lizard occupies a variety of habitats including sagebrush and open pinyon-juniper woodlands, which occur within the allotment. The ground may be stony, sandy, or firm, but some loose soil is usually present (NDOW 2006). Invertebrates and snails are primary prey items.

## **Snow Water Lake Allotment**

Wildlife habitat types within the allotment are variable, ranging from playa, sand dunes, and salt desert scrub, to sagebrush and alkali meadows, to ephemeral and emergent wetland (Figure 2). The western quarter of the allotment is dominated by sagebrush, which transitions to greasewood/salt desert scrub, then into the Snow Water lake area which contains ephemeral water, playas, sand dunes, and is surrounded by sloughs and emergent wetlands. About 1,660 ac are classified as 'lake', and 2,697 ac are classified as 'freshwater emergent wetland'.

A list of priority wildlife species was derived through consultation with NDOW and using the Nevada Comprehensive Bird Conservation Plan (BCP; GBBO 2010). The primary habitat types within the allotment are 'sagebrush', 'salt desert scrub', and 'ephemeral wetland and playa' (GBBO 2010; Table 5). Therefore, to identify priority bird species we used the BCP habitat accounts for those habitat types. In addition, NDOW suggested Loggerhead Shrike, Bald Eagle (winter), Rough-legged Hawk (winter) and Common Nighthawk () as additional priority bird species for the area (Table 5). While the list is not comprehensive of all bird species that may use the allotment, by evaluating habitat conditions for a selected suite of priority species it is reasonable to infer that habitat needs are met for the remainder of sagebrush-associated species. Non-avian priority species were determined in consultation with NDOW.

## **Migratory Birds**

On January 11, 2001, Migratory Bird Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds" was issued. It directed executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act and to conserve migratory birds (the list of migratory birds can be found in 50 CFR 10.13). On 12 April 2010 the BLM entered into a Memorandum of Understanding (MOU) with the US Fish and Wildlife Service to promote the conservation of migratory birds. An example of a conservation measure in the MOU is to manage livestock to avoid impacts on nesting birds and to improve migratory bird habitat. Standard BLM grazing terms and conditions (e.g., maximum utilization levels, 1/4 mile minimum distance from mineral supplements to live water sources, etc.) are designed to minimize impacts to migratory bird populations and help promote their conservation. Several migratory bird species are included on the NDOW wildlife list for the area (Appendix 8).

A list of priority bird species for the allotment was compiled using the Nevada Comprehensive Bird Conservation Plan and priority species lists described within habitat accounts for 'sagebrush', 'salt desert scrub', and 'ephemeral wetland and playa' (GBBO 2010; Table 5). Several species use more than one habitat type.

## Snow Water Lake and Warm Creek Allotments S&G Assessment

| Table 5. <sup>1</sup> Priority species for Snow Water Lake Allotment. Habitat types included sagebrush, salt desert scrub, and ephemeral wetland and playa, as defined in the Nevada Comprehensive Bird Conservation Plan (GBBO 2010). Additional non-avian priority species were suggested by NDOW. |                             |
|--|-----------------------------|
| Species  | Habitat type (GBBO 2010)    |
| <sup>2</sup> Greater Sage-Grouse   | Sagebrush                   |
| <sup>2</sup> Swainson's Hawk   | Sagebrush                   |
| <sup>2</sup> Ferruginous Hawk  | Sagebrush/salt desert scrub |
| <sup>2</sup> Golden Eagle  | Sagebrush/salt desert scrub |
| <sup>2</sup> Prairie Falcon  | Sagebrush/salt desert scrub |
| <sup>2</sup> Burrowing Owl   | Sagebrush/salt desert scrub |
| <sup>2</sup> Short-eared Owl   | Sagebrush                   |
| Sage Thrasher  | Sagebrush                   |
| Brewer's Sparrow   | Sagebrush/salt desert scrub |
| Sage Sparrow   | Sagebrush/salt desert scrub |
| Gray Flycatcher  | Sagebrush                   |
| Common Poorwill  | Sagebrush/salt desert scrub |
| <sup>2</sup> Snowy Plover  | Ephemeral Wetland and Playa |
| Black-necked Stilt   | Ephemeral Wetland and Playa |
| American Avocet  | Ephemeral Wetland and Playa |
| Western Sandpiper  | Ephemeral Wetland and Playa |
| Least Sandpiper  | Ephemeral Wetland and Playa |
| Long-billed Dowitcher  | Ephemeral Wetland and Playa |
| Wilson's Phalarope   | Ephemeral Wetland and Playa |
| Red-necked Phalarope   | Ephemeral Wetland and Playa |
| ( <sup>2</sup> Pinyon Jay)   | Sagebrush                   |
| (Cinnamon Teal)  | Ephemeral Wetland and Playa |
| (Marbled Godwit)   | Ephemeral Wetland and Playa |
| <sup>2,3</sup> Loggerhead Shrike   | Sagebrush/salt desert scrub |
| <sup>2,3</sup> Bald Eagle  | Sagebrush/salt desert scrub |
| <sup>3</sup> Rough-legged Hawk   | Sagebrush/salt desert scrub |
| <sup>3</sup> Common Nighthawk  | Sagebrush/salt desert scrub |
| <sup>3</sup> Greater Short-horned Lizard   | Sagebrush/salt desert scrub |
| <sup>2,3</sup> Pygmy Rabbit  | Sagebrush/salt desert scrub |
| <sup>3</sup> American Pronghorn  | Sagebrush/salt desert scrub |
| <sup>1</sup> Species that use the habitat type to a significant degree. Species listed in parentheses indicate that the bird uses the habitat occasionally, seasonally, or opportunistically, but is not primarily dependent upon it (GBBO 2010).  |                             |
| <sup>2</sup> BLM Special Status Species.   |                             |
| <sup>3</sup> Additional Priority bird species suggested by NDOW.   |                             |

### Special Status Species

#### *Snowy Plover*

Non-vegetated or sparsely vegetated habitat includes playas with ephemeral water in Snow Water Lake. Snowy Plovers (*Charadrius alexandrinus*) nest on the ground on broad open beaches, salt or dry mud flats, and barren shorelines of alkaline playa lakes where vegetation is

## Snow Water Lake and Warm Creek Allotments S&G Assessment

sparse or absent (Wildlife Action Plan Team 2006, GBBO 2010). Such habitat occurs on the margins of Snow Water Lake within the allotment. Although not documented, this area may host nesting Snowy Plovers.

### *Pygmy Rabbit*

Pygmy rabbits are present within the allotment (NDOW 2006). The pygmy rabbit is a BLM Sensitive Species petitioned for listing as threatened or endangered under the ESA. On May 20, 2005, the U.S. Fish and Wildlife Service announced a 90-Day finding in the Federal Register indicating that, "... the petition does not provide substantial information indicating that listing the pygmy rabbit may be warranted." The finding does not downplay the need to conserve, enhance or protect pygmy rabbit habitat. Pygmy rabbits are found in a variety of vegetation types, including sagebrush, greasewood, and salt desert scrub habitats, provided that the area contains deep, friable soils appropriate for constructing burrows. Four pygmy rabbits were observed in the allotment during a waterbird survey by NDOW in 2006.

### *Preble's Shrew*

Likely habitat associations for Preble's shrews (*Sorex preblei*) collected in northeastern Nevada were described as "ephemeral and perennial streams dominated by shrubs, primarily below 2,500 m in elevation" (Ports and George 1990). At Sheep Creek, ~55km north of Elko, Ports and George (1990) collected 12 specimens "in a seasonally wet, sagebrush-dominated community." Little else is known about the ecology and distribution of Preble's shrew in Nevada or its specific habitat needs. Given the brief description of habitat associations of Preble's shrews in northeastern Nevada, it is reasonable to expect that the species could occur within the allotment.

### *Greater Sage-Grouse*

Although only a portion of the allotment contains sagebrush, Sage-Grouse may utilize this area, and may also utilize agricultural fields on private land within the allotment. Approximately 5,323 acres in the southwestern corner of the allotment overlap with the 75% Breeding Density area for Sage-Grouse (Doherty et al. 2010; Figure 5). Approximately 45% of the overlap area is managed by BLM, and 55% is privately owned. There is a single Sage-Grouse lek within the allotment, located on private land (Figure 5). The status of this lek is 'unknown'. Seventeen additional leks occur within 5.3 miles of the allotment, as detailed in Table 6 and Figure 5.

**Table 6.** Sage-Grouse leks within 5.3 miles of the Snow Water Lake Allotment. Data compiled from Nevada Department of Wildlife Sage-Grouse lek database, 2011.

| Lek                 | Distance from Allotment (miles) | Last Active | Last survey | <sup>1</sup> Lek Status | # Males |
|---------------------|---------------------------------|-------------|-------------|-------------------------|---------|
| Warm Creek 1        | Within allotment                | ?           | 2008        | Unknown                 | 0       |
| Warm Creek 2        | 2.2                             | 1986        | 2007        | Unknown                 | 0       |
| South Clover 3      | 2.2                             | 2011        | 2011        | Unknown                 | 7       |
| Curtis Springs NE   | 2.4                             | ?           | 2007        | Unknown                 | 0       |
| South Clover 2      | 2.5                             | 2002        | 2002        | Unknown                 | 8       |
| Ravine              | 2.6                             | 1986        | 2010        | Unknown                 | 0       |
| Snow Fence          | 2.7                             | 1986        | 2007        | Unknown                 | 0       |
| W. Spruce Mt. Ridge | 3.2                             | 1971        | 2010        | Unknown                 | 0       |
| Bluff               | 3.6                             | 2011        | 2011        | Active                  | 20      |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

**Table 6.** Sage-Grouse leks within 5.3 miles of the Snow Water Lake Allotment. Data compiled from Nevada Department of Wildlife Sage-Grouse lek database, 2011.

| Lek                | Distance from Allotment (miles) | Last Active | Last survey | <sup>1</sup> Lek Status | # Males |
|--------------------|---------------------------------|-------------|-------------|-------------------------|---------|
| Wiseman 1          | 3.7                             | 2009        | 2009        | Unknown                 | 8       |
| Wolverton          | 3.9                             | 1986        | 2008        | Unknown                 | 0       |
| South Clover 1     | 4.1                             | 1966        | 2010        | Unknown                 | 0       |
| Second Beach       | 4.2                             | ?           | 2010        | Unknown                 | 0       |
| Curtis Spring East | 4.4                             | 2011        | 2011        | Active                  | 7       |
| S. Horse Creek     | 4.5                             | 2007        | 2011        | Unknown                 | 0       |
| Reseed             | 4.6                             | 1985        | 2007        | Unknown                 | 0       |
| W. Arizona Spring  | 4.9                             | 2007        | 2010        | Unknown                 | 0       |

<sup>1</sup>See Lek Status definitions in Table 4.

No key areas have been established specifically to measure Sage-Grouse habitat characteristics. Range Key Areas 1 and 2 were located in saline meadow and greasewood ecological site types, respectively. Because these sites were not Sage-Grouse habitat, data collected there was not evaluated for Sage-Grouse habitat values.

Key Area 3 was located on a black sage\Indian ricegrass ecological site type, which was seeded with crested wheatgrass in about the 1960's. At this site, crested wheatgrass decreased from 75.3% composition to 19.6% (as measured by dry weight) from 1986 to 2011. In contrast, sagebrush increased from 14.7% composition to 46.3% (as measured by dry weight) during the same time period, while production increased from 758 to 2,256 lbs/ac. These observations indicate substantial improvement toward desired conditions for Sage-Grouse during the time period.

Key Area 4 was located on a black sage\Indian ricegrass ecological site type, which was seeded with crested wheatgrass in about the 1960's. Crested wheatgrass decreased from 70.6% composition to 53.8% (as measured by dry weight) from 1992-2011. In addition, sagebrush increased from 6.1 to 22.2% composition during the same time period. Likewise, total vegetative production increased from 288 to 1342 lbs/ac. These observations indicate substantial improvement toward desired conditions for Sage-Grouse during the time period. Production data is summarized in Appendix 4.

### *Dark Kangaroo Mouse*

The dark kangaroo mouse (*Microdipodops megacephalus*) is adapted to arid rangelands and can be found in areas of loose sands and gravel, but may occur in sand dunes near the margins of its range. Arthropods represent an important dietary component.

### *Bats*

Although no surveys for bats have been conducted, the allotment is likely important foraging habitat for many bat species, all of which are BLM Sensitive Species. Wetlands and surface water associated with springs, drainages, ephemeral wetlands, and sagebrush rangelands provide habitat for many bat species. Water sources are especially critical to bats because they drink from open water and because these areas provide an insect forage base. Healthy sagebrush and salt desert scrub habitats, as well as irrigated agricultural fields also provide a variety of insect

## Snow Water Lake and Warm Creek Allotments S&G Assessment

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forage for many bat species. Bats that are known or likely to occur within the allotment can be found in Appendix 8.

### Non-special status species

#### *Mammals – Big Game*

About one percent of the allotment is classified as crucial summer deer habitat, all of which burned in the 2001 Egbert Fire. The remainder of the allotment is classified as intermediate deer habitat. No key areas have been established to monitor either habitat type. Although four key areas were established for monitoring livestock impacts, habitat ratings for deer were not calculated because browse vigor and vertical cover ratings were not collected at these sites.

# Snow Water Lake and Warm Creek Allotments S&G Assessment

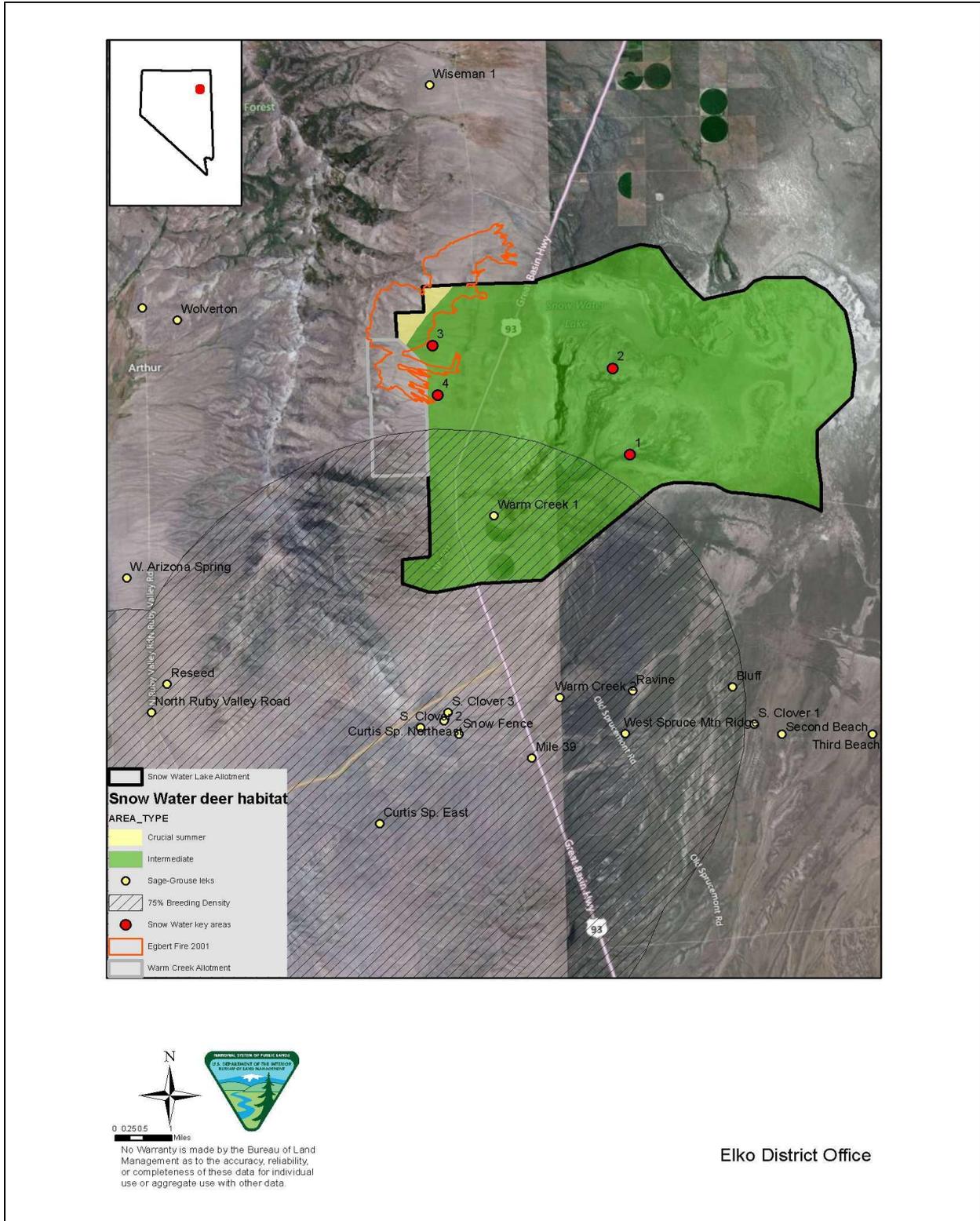


Figure 5. Locations of key areas and mule deer habitat within the Snow Water Lake Allotment. Also displayed are Sage-Grouse leks within 5.3 miles of the allotment. The entire allotment is classified as yearlong pronghorn habitat.

## Snow Water Lake and Warm Creek Allotments S&G Assessment

All of the allotment is classified as yearlong pronghorn habitat. No key areas have been established specifically to monitor pronghorn habitat condition, but data collected at key areas for livestock monitoring were used to evaluate pronghorn habitat quality. Data collected at four sites indicated that pronghorn habitat quality ranged from Fair to Good (Table 7). However, one deficiency present within the allotment that was not noted on monitoring forms was the presence of fences that are not built to BLM wildlife-friendly specifications.

| Key Area | 1983      | 1986      | 1987      | 1992      | 2011      |
|----------|-----------|-----------|-----------|-----------|-----------|
| 1        | Fair (57) | --        | Fair (57) | Fair (53) | Good (77) |
| 2        | Fair (57) | --        | --        | --        | Good (74) |
| 3        | --        | Good (73) | --        | --        | Good (86) |
| 4        | --        | --        | --        | Good (72) | Good (75) |

Neither elk (*Cervus elaphus*) nor bighorn sheep (*Ovis canadensis*) use the allotment. Most of the area is classified as mule deer intermediate range, with a small percentage in the northwestern corner classified as crucial summer range (Figure 5). It is unknown to what degree, if any, mountain lions utilize the allotment.

### *Amphibians and Reptiles*

The Greater Short-horned Lizard occupies a variety of habitats including sagebrush, which occurs within the allotment. The ground may be stony, sandy, or firm, but some loose soil is usually present (NDOW 2006). Invertebrates and snails are primary prey items.

**Plants:** There are no known Special Status plant species within the allotment.

**Invertebrates:** There are no known Special Status invertebrates within the allotment.

### **I. Riparian**

There are no known water resources within the Warm Creek Allotment. The Snow Water Lake Allotment contains perennial and intermittent springs, seeps and intermittent streams and ponds which support diverse riparian areas. There are about 15 springs and seeps on public land in the Snow Water Lake Allotment located primarily in the western portion. BLM has recorded water quality information or other data at 13 of these sites. Most of these springs/seeps (springs) discharge very little water and no overland flow is measurable at the surface. Most support riparian areas that are less than 1/10 acre in size, and there are a few spring complexes which are around ½ acre. Riparian areas surrounding intermittent streams and ponds within the allotment cover a much larger area. These occur primarily on private land. BLM has not recorded any data for the small portions of riparian areas associated with intermittent streams and ponds that occur on BLM administered land within the allotment.

Riparian condition assessments were conducted during 2002 and 2008 to evaluate the condition of selected riparian areas within the Snow Water Lake Allotment. Riparian condition assessments are qualitative assessment of riparian areas based on quantitative science. The methodology evaluates the functionality of riparian areas based on hydrological, vegetation, and

# Snow Water Lake and Warm Creek Allotments S&G Assessment

soils/erosional factors, within the context of the geologic setting and the potential of the area. Prichard et al. (1999) suggests the following definitions for spring and lentic areas:

“Lentic riparian-wetland areas are functioning properly when adequate vegetation, landform, or debris is present to:

- 1) dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality;
- 2) filter sediment and aid floodplain development;
- 3) improve flood-water retention and ground-water recharge;
- 4) develop root masses that stabilize islands and shoreline features against cutting action;
- 5) restrict water percolation;
- 6) develop diverse ponding characteristics to provide the habitat and water depth, duration, and temperature necessary for fish production, water bird breeding, and other uses;
- 7) and support greater biodiversity.”

Lentic assessments were completed in 2002 by BLM for seven riparian areas within the Snow Water Lake Allotment. The assessments concluded that all of these riparian areas were in proper functioning condition. Lentic assessments completed in 2008 by JBR Environmental Consultants (JBR) concluded that four out of seven sites were in proper functioning condition and the remaining three were functional at risk. During 2002 and 2008 a total of ten separate riparian areas were assessed; the 2008 survey repeated assessment at four of the sites already assessed during 2002 (see table 8).

| <b>Table 8: PFC Ratings</b>                       |         |  |         |
|---|---------|--|---------|
| 2002  |         | 2008   |         |
| Lentic Area Identification                        | *Rating | Lentic Area Identification                     | *Rating |
| Snow Water Lake 1                                 | PFC     |  |         |
| Playa Spring 3                                    | PFC     |  |         |
| Playa Spring 4                                    | PFC     |  |         |
| Greek Spring Enclosure                            | PFC     | Snow Water Lake 8                              | FARD    |
| Snow Water Lake 2                                 | PFC     | Snow Water Lake 7                              | PFC     |
| Playa Complex 1                                   | PFC     | Snow Water Lake 3,4,5                          | FARD    |
| Playa Complex 2                                   | PFC     | Snow Water Lake 2                              | PFC     |
|   |         | Snow Water Lake 1                              | PFC     |
|   |         | Snow Water Lake 6                              | FARN    |
|   |         | Snow Water Lake 9                              | FAR     |
| <b>*Rating Key</b>                                |         |  |         |
| PFC = Proper Functioning Condition                |         | FARD = Functioning at Risk with Downward trend |         |
| FARN = Functioning at Risk with No apparent trend |         | NF = Non-Functional                            |         |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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A narrative of data collected at each water resource within the Snow Water Lake Allotment is presented below. In general riparian areas are in good condition. Sites rated as functional at risk were given this rating because of weed infestations occurring at these sites. Direct impacts from grazing were not cited as a causal factor of functional at risk ratings. Water quality data collected during 1980, 2002 and 2008 were typical of water resources in this type of setting. Because none of the data collected indicated that there were any water quality issues, these data are not presented in the narratives below. Sites are identified by: Water Resource Inventory ID, 2002 Lentic area ID (if any), 2008 Lentic ID (if any).

## **N33E6101AA, Snow Water Lake #1**

This is a small perennial spring that BLM visited in 1980 and 2002. It supports about 1000 square feet of riparian vegetation. The 1980 inventory suggests that the spring was dug out and a pond was created; however, by 2002 the pond was mostly filled in with sediment. The 2002 lentic assessment rated this spring in proper functioning condition. Water was visible on the surface, but there was no measurable flow.

## **N32E6206CA**

This is a pair of small perennial springs that BLM visited in 1979. Together these springs support about 2000 square feet of riparian vegetation.

## **N33E6206CAB**

This is a small perennial spring that BLM visited in 1980 that supports about 1500 square feet of riparian vegetation. There was no measurable flow, but water was visible on the surface.

## **N33E6206CDA, Playa Spring 3**

This is a small perennial spring that BLM visited in 2002. It supports about 1000 square feet of riparian vegetation. Water was visible on the surface, but there was no measurable flow. The lentic assessment rated this spring in proper functioning condition.

## **N33E6206DB, Snow Water Lake 6**

This is a small perennial spring that BLM visited in 1979, and JBR visited in 2008. The spring supports about 1/10 acre of riparian vegetation. Water was flowing on the surface but was too small and diffuse to measure. The 2008 Lentic assessment rated this site as functioning at risk with no apparent trend. A Russian thistle infestation was cited as the reason for the at risk rating.

## **N33E6206DCC, Playa Complex 2, Snow Water Lake 2**

This is a spring complex that was visited by BLM in 1980 and 2002, and JBR in 2008. The complex supports about ½ acre of riparian vegetation. Water was visible on the surface, but there was no measurable flow. The 2002 and 2008 lentic assessments both rated this spring in proper functioning condition.

## **N33E6206DCD, Playa Complex 1, Snow Water Lake 3,4,5**

This is a spring complex that was visited by BLM in 1980 and 2002, and JBR in 2008. The complex supports about 4/5 acre of riparian vegetation. Water was flowing on the surface but was too small and diffuse to measure. Surveys indicate that that the source was developed at one time with a pond that may have been fenced; however, fences were in disrepair even prior to 1980. Lentic assessments rated this site in proper functioning condition in 2002 and functional at

## Snow Water Lake and Warm Creek Allotments S&G Assessment

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risk with downward trend in 2008. Invasion by noxious weeds is cited as the causal factor for the 2008 rating.

### **N33E6207AB**

This is a small perennial spring that BLM visited in 1980 that supports about 1000 square feet of riparian vegetation. There was no measurable flow but water was visible on the surface.

### **N33E6207BAA, Snow Water Lake 1**

This is an intermittent spring or dry meadow that JBR visited in 2008. The area surveyed included about 1/3 acre; however it is not clear whether any riparian vegetation actually existed. There was no water visible at the surface. The site was rated as being in properly functioning condition.

### **N33E6207BC, Playa Spring 4**

This is a perennial spring that BLM visited in 2002 that supports about 1000 square feet of riparian vegetation. There was no measurable flow but water was visible on the surface. The site was rated in proper functioning condition.

### **N43E6125DA, Snow Water Lake 9**

This is a pair of small intermittent springs that were visited by BLM in 1980 and 2002 and by JBR in 2008. The springs do not appear to support any obligate riparian vegetation. Flow was estimated to be less than 0.1 gallons per minute in June 1980. The site was rated as functional at risk in 2008. No determination of trend was entered and no justification for the at risk rating was identified. It was likely rated this way due to the limited availability of water; therefore, livestock grazing was not a causal factor.

### **N34E6136AAC, Greek Springs Exclosure, Snow Water Lake 8**

This source is identified as Greek Spring on the 100k topographical map. It is a perennial spring that supports 1-2 acres of Russian olive and a much smaller area of obligate herbaceous riparian vegetation. It was visited by BLM in 1979, 1980, and 2002 and by JBR in 2008. It was estimated that 0.5 gallons per minute were flowing from this source in 2002. The spring source was developed in the past and piped to a trough; however the development no longer functions. A large intact livestock exclosure prevents grazing within the riparian area. The site was rated as being in proper functioning condition in 2002 and functional at risk with downward trend in 2008. The causal factor for the at risk rating was presence of invasive and noxious species. Observers noted that expansion of the Russian olive community was likely using water that would otherwise be available for obligate herbaceous species.

### **N34E6136DB, Snow Water Lake 2, Snow Water Lake 7**

This is a spring complex that supports about ½ acre of Russian olive and a much smaller area of obligate herbaceous riparian vegetation. The site was visited by BLM in 1980 and 2002 and by JBR in 2008. An intact fence prevents access by livestock and there is no evidence there have ever been any livestock watering developments constructed. The site was rated as being in proper functioning condition both in 2002 and 2008.

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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## **J. Soils**

The dominant soils in the crested wheatgrass seedings on the Snow Water Lake Allotment are from the Pyrat soil series. They are positioned on upper fan skirts and composed of alluvium derived from mixed rocks. They are moderately deep to deep and well drained with a gravelly sandy loam texture. Surface rock fragments should comprise up to 20% of total ground cover within this site. According to the U.S. Natural Resource Conservation Service Nevada site description, the approximate vegetative ground cover of native vegetation appropriate for the Loamy 8 to 10" p.z. ecological site ranges between 10% to 20%.

The dominant soils in the Creek and Lake Pastures of the Snow Water Lake Allotment consists of a mosaic of up to seven different soil series and associated ecological sites, all heavily dominated by sodic soil conditions. Ecological sites range from barren playas and sand dunes through sodic flats and terraces to dry and saline meadows associated with several usually dry sloughs fed by seasonal irrigation runoff. Most of the soils tend to be silt loam to clay loam in texture and be deep and poorly drained, except for the dunes which are sandy and very well to excessively drained. Surface rock fragments are generally absent. According to the U.S. Natural Resource Conservation Service Nevada site descriptions, the approximate vegetative ground cover appropriate for the sites range from nothing on the playas and lake bottoms to 30-50% cover in the Dry Meadow 6-10" p.z.

The dominant soils in the Warm Creek Allotment are from the Urmafot soil series. They are positioned on upper fan piedmonts and comprised of alluvium derived from mixed rocks. They are moderately deep and well drained with a very gravelly loam texture. Surface rock fragments should comprise up to 50% of total ground cover within this site. According to the U.S. National Resource Conservation Service Nevada site descriptions, the approximate vegetative ground cover of native vegetation for the Shallow Calcareous Loam 10"-14" p.z. ecological site ranges between 15% to 25%.

## **K. Wildland Fires**

The Egbert Fire started on 4 July 2001. The fire burned approximately 1,056 acres of public land administered by the Bureau of Land Management-Elko District Office, 503 acres of public land administered by the United State Forest Service, and 395 acres of private land, for a total of 1,954 acres. The fire affected the Snow Water Lake and Warm Creek Allotments, along with the adjacent Gordon Creek Allotment which is administered by the Forest Service.

## **IV. DRAFT DETERMINATIONS**

This section makes draft determinations regarding:

- A. Progress towards or attainment of the standards for rangeland health,
- B. Whether livestock management is in conformance with the guidelines, and
- C. Whether existing grazing management or levels of grazing use are significant factors in failing to achieve the standards or conform to the guidelines.

These determinations, along with rationales, are based on the 1998 FMUD as well as any supplemental information presented above.

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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

**This standard is being met.**

Landforms present include basin floors, lake plains and fan piedmonts. Warm Creek and Snow Water Lake Allotments are adjacent to the East Humboldt range and receive significant runoff from snowmelt from these mountains.

Historic grazing has caused drainages on alluvial fans to downcut several feet. Drainages appear to be more stable currently as new vegetation has established and no current erosion is occurring. Erosion was observed along roads where the compacted surface accelerates overland flow and causes gully erosion. No other excessive erosion is occurring although normal soil movement in the form of slight pedestalling of grass plants was observed. Adequate vegetation is present to allow for proper infiltration and permeability for soils.

During the 1960's, the native plant community within Pastures A, B, and C of the Snow Water Lake Allotment were converted to crested wheatgrass seedings. Crested wheatgrass was seeded for the purpose of suppressing halogeton, providing forage for livestock and to increase flexibility in grazing management options in other areas. The dominant ecological site within the crested wheatgrass seedings in the Snow Water Lake Allotment is Loamy 8"-10" p.z. The site characteristics and the average annual precipitation associated with this ecological site are suitable for producing healthy and vigorous crested wheatgrass plant communities. Plant communities dominated by crested wheatgrass in this ecological site have the potential of achieving favorable site stabilization characteristics associated with the attainment of this standard.

Recent monitoring information including key area point sampling cover data accompanied by field observations indicate that sufficient vegetative cover, litter and rock fragments are present to meet the requirements of this standard given the potential of the sites monitored.

Furthermore, the utilization objectives established on both allotments have largely been achieved since 1988. The attainment of the utilization objective in conjunction with the appropriate season of use has resulted in healthy and vigorous crested wheat plants in Pastures A, B, and C of the Snow Water Lake Allotment and healthy and vigorous native plants in the native pastures of Snow Water Lake and Warm Creek Allotments. The vegetative cover required to stabilize soils and ensure appropriate infiltration and permeability rates is being maintained in both allotments.

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

**This standard is being met.**

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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Most of the lentic sites were rated in proper functioning condition. Livestock grazing is not a causal factor for those sites which are rated as functional at risk. Water quality is typical of sites in this type of setting and meets state water quality criteria.

**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 life cycle requirements of threatened and endangered species.

**This standard is being met.** Livestock management is considered to be in conformance with the guidelines.

## Warm Creek

The 2011 field observations and monitoring indicate habitats in the allotment exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics and are providing suitable feed, water, cover and living space for wildlife, including Special Status Species.

Habitat for Sage-Grouse within the allotment was not quantitatively assessed. However, qualitative observations throughout sagebrush habitat in the allotment, combined with composition data from the two key areas, indicated that there were no obvious cover deficiencies in the herbaceous understory or sagebrush canopy.

Mule deer and pronghorn habitat was rated as Good. Modification of existing fences to BLM wildlife-friendly specifications would further improve habitat conditions for mule deer and pronghorn.

## Snow Water Lake

The 2011 field observations and monitoring indicate habitats in the allotment exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics and are providing suitable feed, water, cover and living space for wildlife, including Special Status Species.

Key area data from 1983-2011 indicated that historic crested wheatgrass seedings on black sagebrush ecological sites are progressing toward those described for the site. This represents improving habitat conditions for Sage-Grouse, pygmy rabbits and other sagebrush obligates or associates.

During 1983-2011, pronghorn habitat quality ranged from Fair to Good at four key areas within the Allotment. In 2011, all four key areas were rated as Good, indicating either stable or improved habitat quality from previous ratings. One deficiency not noted on monitoring forms, but which exists is the presence of fences that were not constructed to BLM wildlife-friendly specifications. Modification of these fences would improve habitat conditions for pronghorn and mule deer.

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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

**This standard is being met.**

Rangeland management plans, including term grazing permit renewals will consider listings of known sites that are National Historic Register eligible or considered to be of cultural significance as well as new eligible sites as they become known. Based on the evaluation of existing information pertaining to range improvements and grazing, cultural resources are being recognized within the context of multiple use management in the Snow Water Lake and Warm Creek Allotments.

## IV. POSSIBLE FUTURE MANAGEMENT ALTERNATIVES

The BLM has developed the following as a list of possible management alternatives connected with the renewal of the Snow Water Lake and Warm Creek Allotment grazing permit that could be analyzed in a document prepared to comply with the National Environmental Policy Act (NEPA). The BLM is seeking input from the permittee, affected agencies, and members of the public interested in livestock grazing management on the Snow Water Lake and Warm Creek Allotments on these alternatives or in developing additional management strategies and alternatives that are in conformance with the Wells Resource Management Plan and that will make significant progress towards attaining the Standards and Guidelines for Rangeland Health. Comments received through this scoping process will be used in the preparation of a new environmental analysis and disclosure of impacts to be prepared for compliance with the National Environmental Policy Act (NEPA). The process will result in BLM issuing a new grazing permit renewal decision for the Snow Water Lake and Warm Creek Allotments.

### **Alternative 1: Application for Change in Type of Livestock**

On 29 July 2011, Tommy, LLC submitted an application to change the type of livestock use and grazing system on the Snow Water Lake and Warm Creek Allotments. This application included the following items:

- a. Change type of livestock from cattle to horses.
- b. Propose converting existing cattle AUMs to horse AUMs at a 1:1.2 ratio. This would adjust permitted use to 922 AUMs on the Snow Water Lake Allotment and 99 AUMs on the Warm Creek Allotment.
- c. Implement the following grazing system for 200 horses:

## Snow Water Lake and Warm Creek Allotments S&G Assessment

| <b>Table 9: Grazing System Proposed by Permittee</b>   |           |           |
|--|-----------|-----------|
| Pasture  | Year 1    | Year 2    |
| Snow Water Lake Allotment  |           |           |
| C*   | 4/1-4/5   | --        |
| A  | 4/5-5/7   | 5/29-7/4  |
| B  | 5/23-6/27 | 4/23-5/28 |
| C  | 6/28-7/19 | 4/1-4/22  |
| <i>Private Ground</i>  | 7/20-8/14 | 7/20-8/14 |
| Creek  | 8/15-9/9  | 9/10-10/5 |
| Lake   | 9/10-10/5 | 8/15-9/9  |
| Warm Creek Allotment   |           |           |
| <i>Private Ground</i>  | 10/6-3/31 | 10/6-3/31 |
| *Year 1 turnout would be into Pasture C; Permittee would be allowed 5 days to trail horses to Pasture A to start rotation. |           |           |

d. Construct the following range improvements:

1. Additional water source in junction of Pastures A and B of the Snow Water Lake Allotment and the Warm Creek Allotment. This could be either a pipeline from the existing aqueduct, a pipeline from the existing well in Pasture A, and/or a new well drilled at or near the powerline that passes through the area.
2. Additional water source in south end of Pasture C of the Snow Water Lake Allotment. This could be some combination of a pipeline extension from the existing trough and reservoir at the north end of Pasture C, a new well drilled underneath or near the existing powerline, and/or a redesign/rebuild of the Government Spring project (BLM project #0878) in the Spruce Allotment at the southern boundary of Pasture C. Any actions involving Government Spring would require coordination with the owner of the water rights associated with that spring.
3. Investigate reconstructing water project in Creek and Lake Pasture. These could include (a) BLM project #4570, a well in the Creek Pasture; (b), BLM project #4940, a well along the northern boundary of the Lake Pasture, and/or (c) BLM project #4747, a pipeline extending from a well in Pasture A underneath Highway 93 to a trough in the Lake Pasture on the east side of the highway.

Tommy, LLC has indicated a willingness to help finance the costs associated with these projects should they be approved.

### **Alternative 2: Greater Sage-Grouse friendly Alternative**

This alternative could include such grazing management actions as implementation of rest-rotation within sage-grouse habitat, deferred grazing within sage-grouse breeding and nesting habitat, elimination or diminution of fencing hazards within important sage-grouse habitat, etc. Elements of this alternative would be incorporated into any alternatives considered to be in conformance with current Sage-Grouse management directives.

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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## **Alternative 3: No Action Alternative**

Under this alternative, the grazing permit would be renewed with no changes to existing terms and conditions. No new range improvements would be constructed. Grazing management would continue to be authorized under the terms of the 2001 Grazing Agreement.

## **Alternative 4: No or Reduced Grazing Alternative:**

Under this alternative, grazing would either be significantly reduced or not be authorized on the public lands within the Snow Water Lake and Warm Creek Allotments.

Specific alternatives to be analyzed in appropriate NEPA analysis will be further identified and refined in response to comments received during the scoping process.

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Bryan K Fuell  
Manager, Wells Field Office

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Date

# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Appendix 1: Actual Use Summary

| <b>Actual use by livestock during the evaluation period</b>                    |                                  |                             |
|--|----------------------------------|-----------------------------|
| <b>Year</b>  | <b>AUMs</b>                      |                             |
|  | <b>Snow Water Lake Allotment</b> | <b>Warm Creek Allotment</b> |
| 1983   | No Data                          | No Data                     |
| 1984   | 691                              | 175                         |
| 1985   | 511                              | No Use                      |
| 1986   | 886                              | No Use                      |
| 1987   | 861                              | No Use                      |
| 1988   | 427                              | 175                         |
| 1989   | 698                              | 148                         |
| 1990   | 887                              | 160                         |
| 1991   | 1111                             | 122                         |
| 1992   | 716*                             | 51                          |
| 1993   | 594                              | No Use                      |
| 1994   | 585                              | No Use                      |
| 1995   | 468                              | No Use                      |
| 1996   | 1111*                            | No Use                      |
| 1997   | 889*                             | No Use                      |
| 1998   | 876                              | 175                         |
| 1999   | 1041*                            | 175*                        |
| 2000   | 806*                             | No Use                      |
| 2001   | 1056*                            | 118*                        |
| 2002   | 994*                             | 85*                         |
| 2003   | 719*                             | 85*                         |
| 2004   | 855                              | No Use                      |
| 2005   | 419                              | 66                          |
| 2006   | 981*                             | 112*                        |
| 2007   | 756                              | 125                         |
| 2008   | 371                              | No Use                      |
| 2009   | 438                              | 65                          |
| 2010   | 396*                             | 59*                         |
| 2011   | No Use                           | No Use                      |
| <b>Average</b>   | <b>746</b>                       | <b>119</b>                  |
| *Actual use not reported or otherwise unavailable; numbers reflect billed use. |                                  |                             |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Appendix 2: Key Area Utilization

| <b>Snow Water Lake Key Area #1<br/>Creek Pasture</b>  |        |        |        |
|---|--------|--------|--------|
| <b>Key Species:</b> Saltgrass ( <i>Distichlis spp.</i> ), Western wheatgrass ( <i>Agropyron smithii</i> ), Alkali muhly ( <i>Muhlenbergia asperifolia</i> ) |        |        |        |
| Desired use: 45% average (not to exceed 60% in any single year)   |        |        |        |
| Year  | DIST   | AGSM   | MUAS   |
| 1988  |        |        |        |
| 1989  | 0%     | 0%     | 0%     |
| 1990  | 1%     |        | 31%    |
| 1991  | 3%     |        | 30%    |
| 1992  | 9%     | 9%     | 18%    |
| 1993  |        |        |        |
| 1994  |        |        |        |
| 1995  | 12%    | 15%    |        |
| 1996  |        |        |        |
| 1997  |        |        |        |
| 1998  |        |        |        |
| 1999  |        |        |        |
| 2000  |        |        |        |
| 2001  |        |        |        |
| 2002  |        |        |        |
| 2003  |        |        |        |
| 2004  |        |        |        |
| 2005  |        |        |        |
| 2006  |        |        |        |
| 2007  |        |        |        |
| 2008  |        |        |        |
| 2009  |        |        |        |
| 2010  |        |        |        |
| 2011  | No Use | No Use | No Use |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

| <b>Snow Water Lake Key Area #2</b>   |        |        |        |        |
|--|--------|--------|--------|--------|
| <b>Lake Pasture</b>  |        |        |        |        |
| <b>Key Species:</b> Saltgrass ( <i>Distichlis sp.</i> ), Western wheatgrass ( <i>Agropyron smithii</i> ), Alkali bluegrass ( <i>Poa juncifolia</i> ), Mat muhly ( <i>Muhlenbergia richardsonis</i> ) |        |        |        |        |
| Desired use: 45% average (not to exceed 60% in any single year)  |        |        |        |        |
| Year   | DIST   | AGSM   | POJU   | MURI   |
| 1988   |        |        |        |        |
| 1989   | <5%    | 1%     | 0%     | 0%     |
| 1990   | 10%    | 0%     | 0%     | 14%    |
| 1991   |        |        |        |        |
| 1992   |        |        |        |        |
| 1993   |        |        |        |        |
| 1994   |        |        |        |        |
| 1995   | 0.5%   |        | 0%     |        |
| 1996   |        |        |        |        |
| 1997   |        |        |        |        |
| 1998   |        |        |        |        |
| 1999   |        |        |        |        |
| 2000   |        |        |        |        |
| 2001   |        |        |        |        |
| 2002   |        |        |        |        |
| 2003   |        |        |        |        |
| 2004   |        |        |        |        |
| 2005   |        |        |        |        |
| 2006   |        |        |        |        |
| 2007   |        |        |        |        |
| 2008   |        |        |        |        |
| 2009   |        |        |        |        |
| 2010   |        |        |        |        |
| 2011   | No Use | No Use | No Use | No Use |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

| <b>Snow Water Lake Key Area #3<br/>Pasture A</b>                         |        |
|--|--------|
| <b>Key Species:</b> Crested wheatgrass<br>( <i>Agropyron cristatum</i> ) |        |
| Desired use: 55% average (not to exceed<br>60% in any single year)       |        |
| Year   | AGCR   |
| 1988   | 15%    |
| 1989   | 0%     |
| 1990   | 0%     |
| 1991   | 20%    |
| 1992   | 39%    |
| 1993   | 13.5%  |
| 1994   |        |
| 1995   |        |
| 1996   |        |
| 1997   |        |
| 1998   |        |
| 1999   |        |
| 2000   |        |
| 2001   |        |
| 2002   | 20%    |
| 2003   | 28%    |
| 2004   |        |
| 2005   |        |
| 2006   |        |
| 2007   |        |
| 2008   |        |
| 2009   |        |
| 2010   |        |
| 2011   | No Use |

| <b>Snow Water Lake Key Area #4<br/>Pasture B</b>                         |        |
|--|--------|
| <b>Key Species:</b> Crested wheatgrass<br>( <i>Agropyron cristatum</i> ) |        |
| Desired use: 55% average (not to exceed<br>60% in any single year)       |        |
| Year   | AGCR   |
| 1988   | 41%    |
| 1989   | 20%    |
| 1990   | 39%    |
| 1991   | 69%    |
| 1992   |        |
| 1993   |        |
| 1994   |        |
| 1995   |        |
| 1996   |        |
| 1997   |        |
| 1998   |        |
| 1999   | 70%    |
| 2000   |        |
| 2001   |        |
| 2002   | 14%    |
| 2003   | >10%   |
| 2004   |        |
| 2005   |        |
| 2006   |        |
| 2007   |        |
| 2008   |        |
| 2009   |        |
| 2010   |        |
| 2011   | No Use |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

| <b>Warm Creek Allotment- Range Key Area</b>  |        |        |
|--|--------|--------|
| <b>Key Species:</b> Bluebunch Wheatgrass ( <i>Agropyron spicatum</i> ), Indian Ricegrass ( <i>Oryzopsis hymenoides</i> ) |        |        |
| Desired use: 45% average (not to exceed 60% in any single year)  |        |        |
| Year   | AGSP   | ORHY   |
| 1988   |        |        |
| 1989   | 34%    | 42%    |
| 1990   | 9%     | 1%     |
| 1991   | 48%    | 38%    |
| 1992   | 5.5%   | 8.5%   |
| 1993   | No Use | No Use |
| 1994   | No Use | No Use |
| 1995   | No Use | No Use |
| 1996   | No Use | No Use |
| 1997   | No Use | No Use |
| 1998   |        |        |
| 1999   | 56%    | 34%    |
| 2000   | No Use | No Use |
| 2001   |        |        |
| 2002   | 26%    | 28%    |
| 2003   |        |        |
| 2004   | No Use | No Use |
| 2005   |        |        |
| 2006   |        |        |
| 2007   |        |        |
| 2008   | No Use | No Use |
| 2009   |        |        |
| 2010   |        |        |
| 2011   | No Use | No Use |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

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| <b>Warm Creek Allotment- Wildlife Key Area DW-7-T-01</b>             |               |             |
|--|---------------|-------------|
| <b>Key Species: Antelope bitterbrush (<i>Purshia tridentata</i>)</b> |               |             |
| <b>Year</b>  | <b>Spring</b> | <b>Fall</b> |
| 1987   | 1%            |             |
| 1988   | 27%           | 29%         |
| 1989   | 48%           | 6%          |
| 1990   | 11%           | 5%          |
| 1991   | 21%           | 3%          |
| 1992   | 8%            | 1%          |
| 1993   | 5%            | 3%          |
| 1994   | 1%            |             |
| 1996   | 0%            |             |
| 1998   | 3%            |             |
| 2001   |               | 7%          |
| 2011   | 0%            |             |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

### Appendix 3: Nested Frequency Data

Snow Water Lake- Key Area #1- Saline Meadow 028BY002NV

| Plant Code | 1983       |       |      | 1987       |     |       | 1992       |       |       | 2011       |       |       | Significant Changes                              |
|------------|------------|-------|------|------------|-----|-------|------------|-------|-------|------------|-------|-------|--|
|            | Frame Size |       |      | Frame Size |     |       | Frame Size |       |       | Frame Size |       |       |  |
|            | 3"         | 10"   | 30"  | 3"         | 10" | 30"   | 3"         | 10"   | 30"   | 3"         | 10"   | 30"   |  |
| AGSM       | 66%        | --    | --   | 69%        | --  | --    | 3.5%       | 23.5% | 74.5% | --         | --    | --    | Decrease '87-'92                                 |
| DIST       | --         | --    | 41%  | --         | --  | 95.5% | 34%        | 78%   | 90%   | 57%        | 87%   | 98.5% | Increase '83-'87 (30"),<br>Increase '92-'11 (3") |
| SPAI       | --         | --    | 1%   | --         | --  | 0.5%  | --         | --    | --    | --         | --    | --    |  |
| HOJU       | --         | --    | 13%  | --         | --  | --    | --         | --    | --    | --         | --    | --    |  |
| MUAS       | 22%        | 60.5% | --   | --         | --  | --    | 86%        | 94%   | 95%   | --         | --    | --    | Increase '83-'92                                 |
| CAREX      | --         | --    | 6%   | --         | --  | 4.5%  | --         | --    | --    | 11%        | 23%   | 35%   | Increase '87-'11                                 |
| ATRIP      | --         | --    | 1%   | --         | --  | 2%    | --         | --    | --    | --         | --    | --    |  |
| AAFF       | --         | --    | 4%   | --         | --  | 0.5%  | --         | --    | 12.5% | --         | --    | --    |  |
| CHNA2      | --         | --    | 0.5% | --         | --  | --    | --         | --    | 1.5%  | --         | 0.5%  | 2%    |  |
| JUBA       | --         | --    | --   | --         | --  | 4.5%  | --         | --    | 5.5%  | 5%         | 17.5% | 37.5% | Increase '92-'11                                 |
| TAOF       | --         | --    | --   | --         | --  | 0.5%  | --         | --    | --    | --         | --    | --    |  |
| POMO5      | --         | --    | --   | --         | --  | --    | 51.5%      | 67%   | 74%   | --         | --    | --    |  |
| POJU       | --         | --    | --   | --         | --  | --    | 1%         | 4%    | 8.5%  | --         | --    | --    |  |
| KOCHI      | --         | --    | --   | --         | --  | --    | --         | --    | 12%   | --         | --    | --    |  |
| SIHY       | --         | --    | --   | --         | --  | --    | --         | --    | 0.5%  | --         | 0.5%  | 2%    |  |
| CIRCI      | --         | --    | --   | --         | --  | --    | --         | 1.5%  | 1.5%  | --         | --    | 0.5%  |  |
| AGGL       | --         | --    | --   | --         | --  | --    | --         | --    | --    | 10.5%      | 39.5% | 69%   |  |
| HAGL       | --         | --    | --   | --         | --  | --    | --         | --    | --    | --         | 0.5%  | 2.5%  |  |
| POTEN      | --         | --    | --   | --         | --  | --    | --         | --    | --    | 2%         | 8.5%  | 25.5% |  |
| IVAX       | --         | --    | --   | --         | --  | --    | --         | --    | --    | --         | --    | 0.5%  |  |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

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Snow Water Lake- Key Area #2- Sodic Flat 5-8" P.Z. 028BY020NV

| Plant Code | 1983       |     |       | 2011       |      |       | Significant Changes |
|------------|------------|-----|-------|------------|------|-------|---------------------|
|            | Frame Size |     |       | Frame Size |      |       |                     |
|            | 3"         | 10" | 30"   | 3"         | 10"  | 30"   |                     |
| DIST       | 51.5%      | --  | --    | 47%        | 91%  | 98.5% |                     |
| POJU       | --         | --  | 44.5% | --         | --   | --    |                     |
| HOJU       | --         | --  | 8%    | --         | --   | --    |                     |
| AGSM       | --         | --  | 7%    | --         | --   | --    |                     |
| MURI       | --         | --  | 2.5%  | --         | --   | --    |                     |
| SPGR       | --         | --  | 1%    | --         | --   | --    |                     |
| ASTER      | --         | --  | 55.5% | --         | --   | --    |                     |
| ATRIP      | --         | --  | 5.5%  | --         | --   | --    |                     |
| TRCO       | --         | --  | 29.5% | --         | --   | --    |                     |
| POTENT     | --         | --  | 26.5% | 28%        | 57%  | 82%   | Increase '83-'11    |
| JUBA       | --         | --  | --    | 5.5%       | 13%  | 19%   |                     |
| CAREX      | --         | --  | --    | 2%         | 4.5% | 10.5% |                     |
| AGOSE      | --         | --  | --    | 5.5%       | 29%  | 64%   |                     |
| PHHO       | --         | --  | --    | 0%         | 0.5% | 0.5%  |                     |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

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### Snow Water Lake- Key Area #3- AGCR Seeding

| Plant Code | 1983       |       |       | 2011       |       |       | Significant Changes |
|------------|------------|-------|-------|------------|-------|-------|---------------------|
|            | Frame Size |       |       | Frame Size |       |       |                     |
|            | 3"         | 10"   | 30"   | 3"         | 10"   | 30"   |                     |
| AGCR       | 29%        | 66.5% | --    | 30.5%      | 85.5% | 100%  | Increase (10")      |
| BRTE       | 24.5%      | 71.5% | --    | 2%         | 8%    | 22%   | Decrease?           |
| POSE       | --         | --    | 12.5% | 24.5%      | 73%   | 96.5% | Increase (30")      |
| SIHY       | --         | --    | 19.5% | --         | --    | 2%    | Decrease (30")      |
| AGSP       | --         | --    | 3%    | --         | --    | 4.5%  |                     |
| ORHY       | --         | --    | 1.5%  | --         | --    | 1.5%  |                     |
| ASTER      | --         | --    | 8%    | 0.5%       | 1%    | 3.5%  | Decrease (30")      |
| ARAR8      | --         | 19.5% | 57%   | --         | --    | --    |                     |
| CHNA2      | --         | 33.5% | 77.5% | --         | --    | --    |                     |
| ASTRA3     | --         | --    | --    | 4%         | 23%   | 67.5% |                     |
| LEPID      | --         | --    | --    | 30.5%      | 69%   | 82.5% |                     |
| RATE       | --         | --    | --    | 28%        | 53%   | 81.5% |                     |
| COPA3      | --         | --    | --    | 18.5%      | 59%   | 89.5% |                     |
| PHLO2      | --         | --    | --    | 3%         | 7%    | 17.5% |                     |
| GAYOP      | --         | --    | --    | 0.5%       | 1.5%  | 4%    |                     |
| PHHO       | --         | --    | --    | 0.5%       | 2%    | 14%   |                     |
| ZYGAD      | --         | --    | --    | 0.5%       | 1%    | 5.5%  |                     |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

### Snow Water Lake- Key Area #4- AGCR Seeding

| Plant Code | 1983       |       |      | 2011       |       |       | Significant Changes |
|------------|------------|-------|------|------------|-------|-------|---------------------|
|            | Frame Size |       |      | Frame Size |       |       |                     |
|            | 3"         | 10"   | 30"  | 3"         | 10"   | 30"   |                     |
| AGCR       | 36.5%      | 77.5% | --   | 33%        | 90.5% | 100%  | Increase (10")      |
| BRTE       | 31.5%      | 69.5% | --   | 0.5%       | 2.5%  | 14%   | Decrease ?          |
| POSE       | --         | --    | 9.5% | 14%        | 51.5% | 93.5% | Increase (30")      |
| AGSM       | --         | --    | 2.5% | --         | --    | --    |                     |
| ARAR8*     | --         | --    | 54%  | --         | --    | --    |                     |
| ARARN*     | --         | --    | --   | 3.5%       | 22.5% | 75.5% |                     |
| CHNA2*     | --         | --    | 8%   | --         | --    | --    |                     |
| CHVI8*     | --         | --    | --   | 0.5%       | 5.5%  | 17.5% |                     |
| CHAL9      | --         | --    | 2%   | --         | --    | --    |                     |
| ORHY       | --         | --    | --   | --         | --    | 0.5%  |                     |
| SIHY       | --         | --    | --   | --         | --    | 0.5%  |                     |
| RATE       | --         | --    | --   | 82.5%      | 97.5% | 99.5% |                     |
| ALLIUM     | --         | --    | --   | 0.5%       | 1%    | 17.5% |                     |
| COPA3      | --         | --    | --   | 3.5%       | 12.5% | 41%   |                     |
| PHHO       | --         | --    | --   | --         | 1%    | 9%    |                     |
| ASTRA      | --         | --    | --   | 1%         | 2.5%  | 9%    |                     |
| PHLO2      | --         | --    | --   | 1%         | 3%    | 8%    |                     |
| LEPID      | --         | --    | --   | 2%         | 6.5%  | 15.5% |                     |
| BRASS      | --         | --    | --   | 1%         | 2%    | 8.5%  |                     |
| ZYGAD      | --         | --    | --   | --         | --    | 0.5%  |                     |
| ASTER      | --         | --    | --   | --         | 1%    | 4.5%  |                     |
| DELPH      | --         | --    | --   | --         | --    | 0.5%  |                     |
| LOMAT      | --         | --    | --   | --         | --    | 0.5%  |                     |

\*Indicates likely species misidentifications: ARAR8 and ARARN are probably the same species, as are CHVI8 and CHNA2.

## Snow Water Lake and Warm Creek Allotments S&G Assessment

Warm Creek Allotment- Key Area #1-Shallow Calcareous Loam 8-10" P.Z. 028BY011NV

| Plant Code | 1984       |       |       | 1988       |       |       | 2011       |       |       | Significant Changes                            |
|------------|------------|-------|-------|------------|-------|-------|------------|-------|-------|--|
|            | Frame Size |       |       | Frame Size |       |       | Frame Size |       |       |  |
|            | 3"         | 10"   | 30"   | 3"         | 10"   | 30"   | 3"         | 10"   | 30"   |  |
| AGSP       | --         | 2%    | 5%    | --         | --    | 6%    | 1%         | 3.5%  | 9%    |  |
| PONE       | 25%        | 83.5% | --    | --         | 70.5% | 39.5% | 89%        | 98%   |       | Decrease '84-'88; Increase '88-'11             |
| ORHY       | --         | --    | 1.5%  | --         | --    | 1%    | --         | 0.5%  | 3.5%  |  |
| BRTE       | 22%        | 47%   | --    | --         | --    | 0.5%  | 10.5%      | 42.5% | 67.5% | Decrease '84-'11 (3" frame)                    |
| SIHY       | --         | --    | 11%   | --         | --    | 6.5%  | 3.5%       | 13.5% | 59%   | Increase '88-'11                               |
| AAFF       | --         | --    | 18.5% | --         | --    | --    | --         | --    | --    |  |
| DESO2      | --         | --    | 2%    | --         | --    | --    | 5%         | 17%   | 36%   | Increase '84-'11                               |
| ALLIUM     | --         | --    | 2%    | --         | --    | --    | 1.5%       | 12%   | 43%   | Increase '84-'11                               |
| LEPU       | --         | --    | 16.5% | --         | --    | 4.5%  | 0.5%       | 1.5%  | 10%   | Decrease '84-'88; Stable '84-'11               |
| ERIOG      | --         | --    | 1%    | --         | --    | --    | 0.5%       | 2%    | 8%    |  |
| ASTER      | --         | --    | 4.5%  | --         | --    | 42%   | 5.5%       | 23%   | 44.5% | Increase '84-'88                               |
| ASTRA      | --         | --    | 7.5%  | --         | --    | 13%   | 2%         | 16%   | 47.5% | Increase '88-'11                               |
| PHHO       | --         | --    | 12.5% | --         | --    | 32%   | 5%         | 20%   | 64%   | Increase '84-'88, '88-'11                      |
| ARARN      | --         | 20%   | 85.5% | --         | 41%   | --    | 8.5%       | 44.5% | 98.5% | Increase '84-'88 (10"), Increase '84-'11 (30") |
| CHVI8      | --         | --    | 6.5%  | --         | --    | 10.5% | 0.5%       | 3%    | 10%   |  |
| JUOS       | --         | --    | 0.5%  | --         | --    | 0.5%  | --         | --    | 0.5%  |  |
| ARABI2     | --         | --    | --    | --         | --    | 1%    | --         | 0.5%  | 4.5%  |  |
| CALOC      | --         | --    | --    | --         | --    | 0.5%  | --         | --    | --    |  |
| CASTI2     | --         | --    | --    | --         | --    | 0.5%  | 0.5%       | 1%    | 7%    | Increase ('88-'11)                             |
| CRYPT      | --         | --    | --    | --         | --    | --    | --         | --    | 1.5%  |  |
| RATE       | --         | --    | --    | --         | --    | --    | 37.5%      | 50%   | 65.5% |  |
| COPA3      | --         | --    | --    | --         | --    | --    | 58%        | 80.5% | 91%   |  |
| DELPH      | --         | --    | --    | --         | --    | --    | 1.5%       | 7.5%  | 36.5% |  |
| PHLO2      | --         | --    | --    | --         | --    | --    | 4%         | 17%   | 41%   |  |
| ERPU       | --         | --    | --    | --         | --    | --    | --         | 1%    | 2%    |  |
| CRAC2      | --         | --    | --    | --         | --    | --    | 0.5%       | 1.5%  | 8%    |  |
| ZYGAD      | --         | --    | --    | --         | --    | --    | 0.5%       | 3%    | 17.5% |  |
| PPFF       | --         | --    | --    | --         | --    | --    | --         | 0.5%  | 1.5%  |  |
| LEPID      | --         | --    | --    | --         | --    | --    | 2%         | 5.5%  | 10%   |  |
| LOMAT      | --         | --    | --    | --         | --    | --    | --         | --    | 5%    |  |
| COLLO      | --         | --    | --    | --         | --    | --    | --         | 0.5%  | 1.5%  |  |
| ANTEN      | --         | --    | --    | --         | --    | --    | 1.5%       | 4%    | 11%   |  |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Appendix 4: Production Summary

| <b>Production Data: Creek Pasture (Key Area #1)</b> |   |               |               |               |
|---|---|---------------|---------------|---------------|
| Species   | Total Dry Weight Production (lbs./acre) |               |               |               |
|   | 1983                                    | 1987          | 1992          | 2011          |
| AGSM  | 1,178                                   | 965           | 182           | 9             |
| MUAS  | 41                                      | None recorded | 268           | None recorded |
| DIST  | 240                                     | 293           | 83            | 595           |
| CAREX   | >1                                      | None recorded | None recorded | 246           |
| HOJU  | 10                                      | None recorded | None recorded | None recorded |
| CHNA2   | None recorded                           | 15            | None recorded | 57            |
| POMO5   | None recorded                           | None recorded | 66            | None recorded |
| AAFF  | None recorded                           | None recorded | 10            | None recorded |
| SIHY  | None recorded                           | None recorded | 1             | 44            |
| POJU  | None recorded                           | None recorded | 4             | None recorded |
| JUBA  | None recorded                           | None recorded | None recorded | 64            |
| POA   | None recorded                           | None recorded | None recorded | 1             |
| AGCR  | None recorded                           | None recorded | None recorded | 2             |
| ASTER   | None recorded                           | None recorded | None recorded | 9             |
| AGOSE   | None recorded                           | None recorded | None recorded | 20            |
| PPFF  | None recorded                           | None recorded | None recorded | 8             |
| HAGL  | None recorded                           | None recorded | None recorded | 8             |
| POTEN   | None recorded                           | None recorded | None recorded | 598           |
| <b>Totals</b>                                       | <b>1,470</b>                            | <b>1,273</b>  | <b>614</b>    | <b>1,661</b>  |

| <b>Production Data: Lake Pasture (Key Area #2)</b> |   |               |
|--|---|---------------|
| Species  | Total Dry Weight Production (lbs./acre) |               |
|  | 1983                                    | 2011          |
| DIST   | 485                                     | 101           |
| POJU   | 25                                      | None recorded |
| TRIGL  | 18                                      | None recorded |
| Aster  | 9                                       | None recorded |
| Annual Forb  | 3                                       | None recorded |
| SPGR   | 9                                       | None recorded |
| POTEN  | 9                                       | 278           |
| HOJU   | 1                                       | None recorded |
| SUEDA  | 1                                       | None recorded |
| JUBA   | None recorded                           | 162           |
| AGOSE  | None recorded                           | 14            |
| PPGG   | None recorded                           | 49            |
| <b>Totals</b>                                      | <b>560</b>                              | <b>604</b>    |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

| <b>Production Data: Pasture A (Key Area #3)</b> |   |              |
|---|---|--------------|
| Species   | Total Dry Weight Production (lbs./acre) |              |
|   | 1986                                    | 2011         |
| AGCR  | 571                                     | 443          |
| ORHY  | 15                                      | 21           |
| POSE  | 5                                       | 140          |
| BRTE  | 2                                       |              |
| STTH2   |   | 9            |
| AGSP  |   | 16           |
| LOMAT   |   | 9            |
| AAFF  | 1                                       |              |
| PHHO  | 5                                       | 159          |
| ASTRA   | 1                                       | 74           |
| COPA3   |   | 1            |
| PHLO2   | 1                                       | 12           |
| ALLIUM  | 1                                       | 1            |
| ASTER   | 3                                       |              |
| LUPIN   | 4                                       |              |
| ZYGAD   |   | 6            |
| CHVI8   | 40                                      | 321          |
| ARTRW   | 57                                      | 898          |
| ARAR8   | 53                                      |              |
| ARARN   |   | 147          |
| <b>Totals</b>                                   | <b>759</b>                              | <b>2,257</b> |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

| <b>Production Data: Pasture B (Key Area 4)</b> |   |            |             |
|--|---|------------|-------------|
| Species  | Total Dry Weight Production (lbs./acre) |            |             |
|  | 1986                                    | 1992       | 2011        |
| AGCR   | 571                                     | 204        | 722         |
| ORHY   | 15                                      |            |             |
| POSE   | 5                                       |            | 38          |
| AAFF   | 1                                       |            |             |
| PHHO   | 5                                       | 1          | 1           |
| ASMO7  | 1                                       |            |             |
| PHLO2  | 1                                       |            | 7           |
| ALLIU  | 2                                       |            | 1           |
| LUPIN  | 4                                       |            | 73          |
| ASTER  | 3                                       |            | 2           |
| CHVI8  | 39                                      | 66         | 132         |
| ARTRW  | 58                                      | 18         |             |
| ARAR8*   | 53                                      |            |             |
| ARARN*   |   |            | 298         |
| ASTRA  |   |            | 18          |
| CASTI2   |   |            | 10          |
| TECA2  |   |            | 40          |
| <b>Totals</b>                                  | <b>758</b>                              | <b>289</b> | <b>1342</b> |

ARAR8 and ARARN are probably the same plant species, with a misidentification in one of the two years.

## Snow Water Lake and Warm Creek Allotments S&G Assessment

| <b>Production Data: Warm Creek Allotment</b> |   |               |            |
|--|---|---------------|------------|
| Species                                      | Total Dry Weight Production (lbs./acre) |               |            |
|  | 1985                                    | 1988          | 2011       |
| AGSP   | 12                                      | 1             | 42         |
| PONE3  | 62                                      | 5             | 93         |
| SIHY   | 42                                      | None recorded | 28         |
| ORHY   | 7                                       | None recorded | 28         |
| BRTE   | 4                                       |               | 5          |
| PHHO   | 5                                       | 5             | 60         |
| ASTRA  | 1                                       | 2             | 11         |
| ALLIU  | 2                                       | None recorded | 2          |
| ARENA  | 24                                      | None recorded |            |
| GERAN  | 15                                      | None recorded |            |
| PENST  | 1                                       | None recorded |            |
| ZYGAD  | 5                                       | None recorded | 4          |
| LEPU   | 4                                       | 1             | 3          |
| SENEC  | 1                                       | None recorded |            |
| COUM   | 8                                       | None recorded |            |
| CASTI2                                       | 1                                       | None recorded | 5          |
| COPA3  |   |               | 20         |
| LEPID  |   |               | 5          |
| DELPH  |   |               | 13         |
| CRAC2  |   |               | 7          |
| PHLO2  |   |               | 4          |
| DESCU  |   |               | 3          |
| ORTHO  |   |               | 1          |
| ARABI2                                       |   |               | 2          |
| LOMAT  |   |               | 4          |
| ERIOG  |   |               | 14         |
| AAFF   | 5                                       | None recorded |            |
| ASTER  | None recorded                           | 8             | 28         |
| CHVI8  | 25                                      | 30            | 28         |
| ARARN  | 871                                     | 447           | 576        |
| <b>Totals</b>                                | <b>1095</b>                             | <b>499</b>    | <b>986</b> |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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## Appendix 5: Point Cover Data

| <b>2002 Point Sampling Cover Data</b> |             |              |        |             |       |              |                    |
|---------------------------------------|-------------|--------------|--------|-------------|-------|--------------|--------------------|
| Key Area                              | Basal Cover | Canopy Cover | Litter | Bare Ground | Rock  | Crypt. Crust | Total Observations |
| <b>Warm Creek Allotment</b>           |             |              |        |             |       |              |                    |
| KA 1                                  | 13.6%       | 27.1%        | 16.3%  | 11%         | 27.3% | 4.7%         | 609                |
| <b>Snow Water Lake Allotment</b>      |             |              |        |             |       |              |                    |
| KA 3                                  | 17.8%       | 17.6%        | 28.3%  | 8.7%        | 27.3% | 0.3%         | 618                |
| KA 4                                  | 15.8%       | 17.3%        | 23.7%  | 15.5%       | 21.0% | 6.7%         | 600                |

| <b>2011 Point Cover Summary Data</b> |             |              |        |             |        |              |                    |
|--------------------------------------|-------------|--------------|--------|-------------|--------|--------------|--------------------|
| Key Area                             | Basal Cover | Canopy Cover | Litter | Bare Ground | Rock   | Crypt. Crust | Total Observations |
| <b>Warm Creek Allotment</b>          |             |              |        |             |        |              |                    |
| KA 1                                 | 7%          | 32%          | 13.67% | 25%         | 21.83% | 0.33%        | 599                |
| <b>Snow Water Lake Allotment</b>     |             |              |        |             |        |              |                    |
| KA 1                                 | 7%          | 7%           | 22.83% | 69.83%      | 0%     | 0%           | 640                |
| KA 2                                 | 5%          | 6.33%        | 20%    | 74.33%      | 0%     | 0%           | 634                |
| KA 3                                 | 8%          | 17.17%       | 24.50% | 45.17%      | 7.17%  | 0.33%        | 614                |
| KA 4                                 | 7.17%       | 19.17%       | 21.33% | 43.67%      | 7.67%  | 1%           | 600                |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Appendix 6: Interpreting Indicators of Rangeland Health

| <b>Snow Water Lake- Key Area 1</b>  |                                |  |
|---|--------------------------------|--|
| <b>Indicator</b>  | <b>Departure from Expected</b> | <b>Comments</b>  |
| 1. Rills  | None-Slight                    | None observable  |
| 2. Water-flow Patterns  | None-Slight                    | None observable  |
| 3. Pedestals and/or terracettes   | None-Slight                    | None observable  |
| 4. Bare ground 60%  | None-Slight                    | Despite high % bare ground, site is a seasonally flooded slough- dry now, lots of gopher activity. Very fine texture soil. |
| 5. Gullies  | None-Slight                    | None noted   |
| 6. Wind-scoured, blowouts, and/or deposition areas                        | None-Slight                    | Are present, but would be expected given site (old lakebed) and nature of soils.   |
| 7. Litter movement  | None-Slight                    | Minimal observed   |
| 8. Soil surface resistance to erosion                                     | None-Slight                    | Surface is highly susceptible to erosion, but again that would be expected given nature of site.                           |
| 9. Soil surface loss or degradation                                       | None-Slight                    | Same comments as above.  |
| 10. Plant community composition and distribution relative to infiltration | None-Slight                    | Plant community appropriate to site.   |
| 11. Compaction layer  | None-Slight                    | Seasonally flooded slough.   |
| 12. Functional/structural groups  | None-Slight                    | Site at or near potential give nature of site- would need more water to go past this.                                      |
| 13. Plant mortality/decadence   | None-Slight                    |  |
| 14. Litter amount   | None-Slight                    | Appropriate given wind and site production   |
| 15. Annual production   | None-Slight                    | Appropriate given site   |
| 16. Invasive plants   | None-Slight                    | Trace amounts of Halogeton/poverty weed- good stand of natives   |
| 17. Reproductive capability of perennial plants                           | None-Slight                    | Good recruitment of native species   |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

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| <b>Snow Water Lake- Key Area 2</b>  |                                |                 |
|---|--------------------------------|-----------------|
| <b>Indicator</b>  | <b>Departure from Expected</b> | <b>Comments</b> |
| 1. Rills  | None-Slight                    |                 |
| 2. Water-flow Patterns  | None-Slight                    |                 |
| 3. Pedestals and/or terracettes   | None-Slight                    |                 |
| 4. Bare ground 65%  | None-Slight                    |                 |
| 5. Gullies  | None-Slight                    |                 |
| 6. Wind-scoured, blowouts, and/or deposition areas                        | None-Slight                    |                 |
| 7. Litter movement  | None-Slight                    |                 |
| 8. Soil surface resistance to erosion                                     | None-Slight                    |                 |
| 9. Soil surface loss or degradation                                       | None-Slight                    |                 |
| 10. Plant community composition and distribution relative to infiltration | None-Slight                    |                 |
| 11. Compaction layer  | None-Slight                    |                 |
| 12. Functional/structural groups  | None-Slight                    |                 |
| 13. Plant mortality/decadence   | None-Slight                    |                 |
| 14. Litter amount   | None-Slight                    |                 |
| 15. Annual production   | None-Slight                    |                 |
| 16. Invasive plants   | None-Slight                    |                 |
| 17. Reproductive capability of perennial plants                           | None-Slight                    |                 |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

| <b>Warm Creek Allotment- Key Area 1</b>                                   |                                |                                  |
|---|--------------------------------|----------------------------------|
| <b>Indicator</b>  | <b>Departure from Expected</b> | <b>Comments</b>                  |
| 1. Rills  | None-Slight                    |                                  |
| 2. Water-flow Patterns  | None-Slight                    |                                  |
| 3. Pedestals and/or terracettes   | None-Slight                    |                                  |
| 4. Bare ground %  | None-Slight                    |                                  |
| 5. Gullies  | None-Slight                    |                                  |
| 6. Wind-scoured, blowouts, and/or deposition areas                        | None-Slight                    |                                  |
| 7. Litter movement  | None-Slight                    |                                  |
| 8. Soil surface resistance to erosion                                     | None-Slight                    |                                  |
| 9. Soil surface loss or degradation                                       | None-Slight                    |                                  |
| 10. Plant community composition and distribution relative to infiltration | Slight-Moderate                | Missing some of the bunchgrasses |
| 11. Compaction layer  | None-Slight                    |                                  |
| 12. Functional/structural groups  | Slight-Moderate                | Bunchgrasses less than expected  |
| 13. Plant mortality/decadence   | None-Slight                    |                                  |
| 14. Litter amount   | None-Slight                    |                                  |
| 15. Annual production   | None-Slight                    | Normal                           |
| 16. Invasive plants   | None-Slight                    |                                  |
| 17. Reproductive capability of perennial plants                           | None-Slight                    | Seedling of grasses and shrubs   |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Appendix 7: Key Area Transect Photographs

Snow Water Lake- Key Area #1

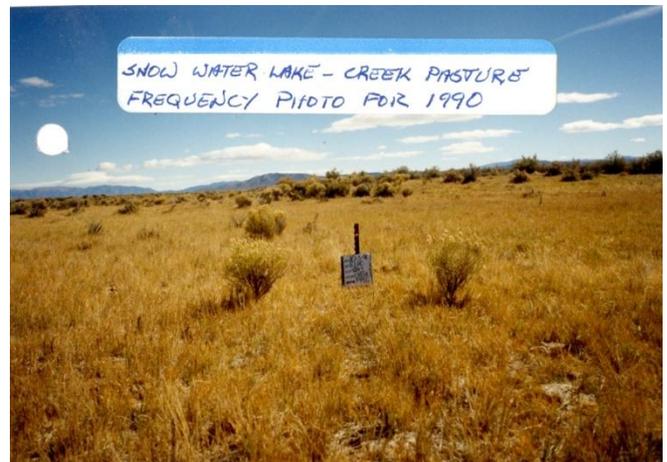
1983



1987



1990



2011



# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Snow Water Lake- Key Area #2

1983



1983



2011



# Snow Water Lake and Warm Creek Allotments S&G Assessment

Snow Water Lake- Key Area #3

1983



1988



2011



# Snow Water Lake and Warm Creek Allotments S&G Assessment

Snow Water Lake- Key Area #4

1983



1988



2011



# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Warm Creek Allotment- Key Area #1

1985



2011



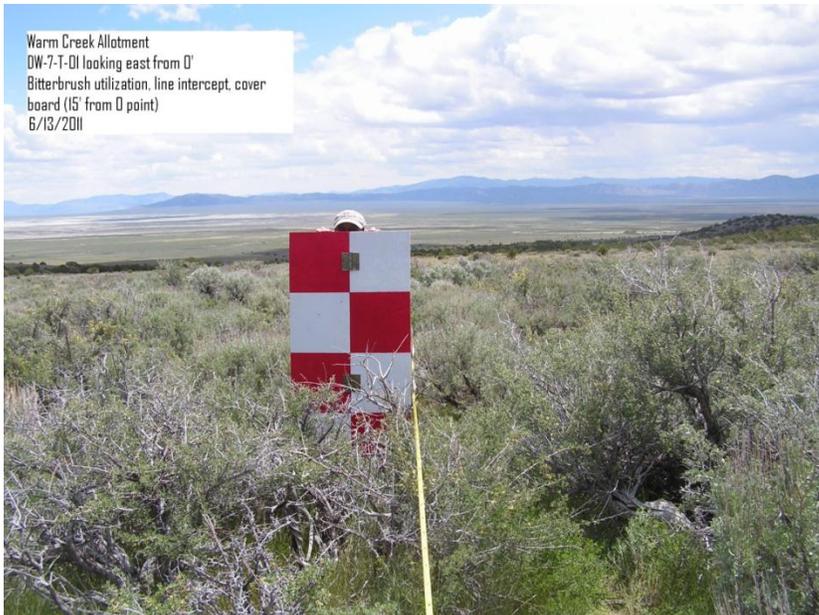
# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Warm Creek Allotment-Wildlife Key Area DW-7-T-01

2009



Warm Creek Allotment  
DW-7-T-01  
Bitterbrush Utilization Monitoring  
6 November 2009



June 13, 2011

Warm Creek Allotment  
DW-7-T-01 looking east from O'  
Bitterbrush utilization, line intercept, cover  
board (15' from O point)  
6/13/2011

# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Appendix 8: Wildlife Species List for the Snow Water Lake Wildlife Management Area and Surrounding Valley Uplands (Units 105 and 101)

### *Birds*

#### **Order: Podicipediformes (Flat-toed Divers)**

##### **Family: Podicipedidae (Grebes)**

|                   |                             |
|-------------------|-----------------------------|
| Pied-billed Grebe | <i>Podilymbus podiceps</i>  |
| Eared Grebe       | <i>Podiceps nigricollis</i> |

#### **Order: Ciconiiformes (Long-legged Waders)**

##### **Family: Ardeidae (Bitterns, Herons, Egrets)**

|                           |                              |
|---------------------------|------------------------------|
| Snowy Egret               | <i>Egretta thula</i>         |
| Black-crowned Night Heron | <i>Nycticorax nycticorax</i> |

##### **Family: Threskiornithidae (Ibises)**

|                  |                       |
|------------------|-----------------------|
| White-faced Ibis | <i>Plegadis chihi</i> |
|------------------|-----------------------|

##### **Family: Cathartidae (New World Vultures)**

|                   |                                       |
|-------------------|---------------------------------------|
| Turkey Vulture    | <i>Cathartes aura</i>                 |
| California Condor | <i>Gymnogyps californianus</i> (L.E.) |

#### **Order: Anseriformes (Waterfowl)**

##### **Family: Anatidae (Ducks, Geese, Swans)**

|                             |                              |
|-----------------------------|------------------------------|
| Greater White-fronted Goose | <i>Anser albifrons</i>       |
| Snow Goose                  | <i>Chen caerulescens</i>     |
| Canada Goose                | <i>Branta canadensis</i>     |
| Tundra Swan                 | <i>Cygnus columbianus</i>    |
| Wood Duck                   | <i>Aix sponsa</i>            |
| Gadwall                     | <i>Anas strepera</i>         |
| American Widgeon            | <i>Anas americana</i>        |
| Mallard                     | <i>Anas platyrhynchos</i>    |
| Blue-winged Teal            | <i>Anas discors</i>          |
| Cinnamon Teal               | <i>Anas cyanoptera</i>       |
| Northern Shoveler           | <i>Anas clypeata</i>         |
| Northern Pintail            | <i>Anas acuta</i>            |
| Green-winged Teal           | <i>Anas crecca</i>           |
| Canvasback                  | <i>Aythya valisineria</i>    |
| Redhead                     | <i>Aythya americana</i>      |
| Ring-necked Duck            | <i>Aythya collaris</i>       |
| Lesser Scaup                | <i>Aythya affinis</i>        |
| Bufflehead                  | <i>Bucephala albeola</i>     |
| Common Goldeneye            | <i>Bucephala clangula</i>    |
| Barrow's Goldeneye          | <i>Bucephala islandica</i>   |
| Hooded Merganser            | <i>Lophodytes cucullatus</i> |
| Common Merganser            | <i>Mergus merganser</i>      |
| Red-breasted Merganser      | <i>Mergus serrator</i>       |
| Ruddy Duck                  | <i>Oxyura jamaicensis</i>    |

#### **Order: Falconiformes (Diurnal Flesh Eaters)**

##### **Family: Accipitridae (Hawks, Eagles, Osprey)**

|                               |                                 |
|-------------------------------|---------------------------------|
| <sup>1</sup> Bald Eagle       | <i>Haliaeetus leucocephalus</i> |
| Northern Harrier              | <i>Circus cyaneus</i>           |
| Sharp-shinned Hawk            | <i>Accipiter striatus</i>       |
| Cooper's Hawk                 | <i>Accipiter cooperii</i>       |
| <sup>1</sup> Swainson's Hawk  | <i>Buteo swainsoni</i>          |
| Red-tailed Hawk               | <i>Buteo jamaicensis</i>        |
| <sup>1</sup> Ferruginous Hawk | <i>Buteo regalis</i>            |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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Rough-legged Hawk *Buteo lagopus*  
<sup>1</sup>Golden Eagle *Aquila chrysaetos*

## Family: *Falconidae* (Falcons)

American Kestrel *Falco sparverius*  
Merlin *Falco columbarius*  
<sup>1</sup>Peregrine Falcon *Falco peregrinus*  
<sup>1</sup>Prairie Falcon *Falco mexicanus*

## Order: *Galliformes* (Chicken Relatives)

### Family: *Phasianidae* (Grouse, Partridge)

Gray Partridge *Perdix perdix*  
<sup>1</sup>Greater Sage-Grouse *Centrocercus urophasianus*

## Order: *Gruiformes* (Cranes and Allies)

### Family: *Rallidae* (Rails, Coots)

Virginia Rail *Rallus limicola*  
Sora *Porzana carolina*  
American Coot *Fulica americana*

### Family: *Gruidae* (Cranes)

Greater Sandhill Crane *Grus canadensis tabida*

## Order: *Charadriiformes* (Wading Birds)

### Family: *Charadriidae* (Plovers)

Black-bellied Plover *Pluvialis squatarola*  
<sup>1</sup>Snowy Plover *Charadrius alexandrinus*  
Semipalmated Plover *Charadrius semipalmatus*  
Killdeer *Charadrius vociferus*  
Mountain Plover *Charadrius montanus*

### Family: *Recurvirostridae* (Avocets)

Black-necked Stilt *Himantopus mexicanus*  
American Avocet *Recurvirostra americana*

### Family: *Scolopacidae* (Sandpipers, Phalaropes)

Greater Yellowlegs *Tringa melanoleuca*  
Lesser Yellowlegs *Tringa flavipes*  
Solitary Sandpiper *Tringa solitaria*  
Willet *Catoptrophorus semipalmatus*  
Spotted Sandpiper *Actitis macularia*  
<sup>1</sup>Long-billed Curlew *Numenius americanus*  
Marbled Godwit *Limosa fedoa*  
Western Sandpiper *Calidris mauri*  
Least Sandpiper *Calidris minutilla*  
Baird's Sandpiper *Calidris bairdii*  
Long-billed Dowitcher *Limodromus scolopaceus*  
Common Snipe *Gallinago gallinago*  
Wilson's Phalarope *Phalaropus tricolor*  
Red-necked Phalarope *Phalaropus lobatus*

### Family: *Laridae* (Gulls, Terns)

Franklin's Gull *Larus pipixcan*  
Bonaparte's Gull *Larus philadelphia*  
Ring-billed Gull *Larus delawarensis*  
California Gull *Larus californicus*  
Herring Gull *Larus argentatus*  
Caspian Tern *Sterna caspia*  
Forster's Tern *Sterna forsteri*  
<sup>1</sup>Black Tern *Chlidonias niger*

## Order: *Columbiformes* (Pigeons and Allies)

### Family: *Columbidae* (Doves)

Rock Dove *Columba livia*  
White-winged Dove *Zenaida asiatica*

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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|                        |                              |
|------------------------|------------------------------|
| 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> |
|----------|------------------|

### Family: *Strigidae* (Owls)

|                              |                         |
|------------------------------|-------------------------|
| Great Horned Owl             | <i>Bubo virginianus</i> |
| <sup>1</sup> Burrowing Owl   | <i>Athene cucularia</i> |
| <sup>1</sup> Long-eared Owl  | <i>Asio otus</i>        |
| <sup>1</sup> Short-eared Owl | <i>Asio flammeus</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: *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: *Piciformes* (Cavity Builders)

### Family: *Picidae* (Woodpeckers)

|                  |                         |
|------------------|-------------------------|
| Northern Flicker | <i>Colaptes auratus</i> |
|------------------|-------------------------|

## Order: *Passeriformes* (Perching Birds)

### Family: *Tyrannidae* (Flycatchers)

|                         |                              |
|-------------------------|------------------------------|
| Western Wood-Pewee      | <i>Contopus sordidulus</i>   |
| Gray Flycatcher         | <i>Epidonax wrightii</i>     |
| Say's Phoebe            | <i>Sayornis saya</i>         |
| Ash-throated Flycatcher | <i>Myiarchus cinerascens</i> |
| Western Kingbird        | <i>Tyrannus verticalis</i>   |

### Family: *Laniidae* (Shrikes)

|                                |                            |
|--------------------------------|----------------------------|
| <sup>1</sup> Loggerhead Shrike | <i>Lanius ludovicianus</i> |
| Northern Shrike                | <i>Lanius excubitor</i>    |

### Family: *Corvidae* (Jays)

|                         |                                  |
|-------------------------|----------------------------------|
| Western Scrub-Jay       | <i>Aphelocoma californica</i>    |
| <sup>1</sup> Pinyon Jay | <i>Gymnorhinus cyanocephalus</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> |
|-------------|-----------------------------|

### Family: *Hirundinidae* (Swallows)

|                         |                                   |
|-------------------------|-----------------------------------|
| Tree Swallow            | <i>Tachycineta bicolor</i>        |
| Violet-green Swallow    | <i>Tachycineta thalassina</i>     |
| N. Rough-winged Swallow | <i>Stelgidopteryx serripennis</i> |
| Cliff Swallow           | <i>Petrochelidon pyrrhonota</i>   |
| Barn Swallow            | <i>Hirundo rustica</i>            |

### Family: *Paridae* (Chickadees, Titmice)

|                               |                           |
|-------------------------------|---------------------------|
| Mountain Chickadee            | <i>Poecile gambeli</i>    |
| <sup>1</sup> Juniper Titmouse | <i>Baeolophus griseus</i> |

### Family: *Aegithalidae* (Bushtits)

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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|  |  |
|--|--|
| Bushtit  | <i>Psaltriparus minimus</i>            |
| <b>Family: Troglodytidae (Wrens)</b>                   |  |
| Rock Wren  | <i>Salpinctes obsoletus</i>            |
| Marsh Wren   | <i>Cistothorus palustris</i>           |
| <b>Family: Sylviidae (Gnatcatchers)</b>                |  |
| Blue-gray Gnatcatcher                                  | <i>Poliophtila caerulea</i>            |
| <b>Family: Turdidae (Thrushes)</b>                     |  |
| Mountain Bluebird                                      | <i>Sialia currucoides</i>              |
| Townsend's Solitaire                                   | <i>Myadestes townsendi</i>             |
| American Robin   | <i>Turdus migratorius</i>              |
| <b>Family: Mimidae (Thrashers, Mockingbirds)</b>       |  |
| Northern Mockingbird                                   | <i>Mimus polyglottos</i>               |
| Sage Thrasher  | <i>Oreoscoptes montanus</i>            |
| <b>Family: Sturnidae (Starlings)</b>                   |  |
| European Starling                                      | <i>Sturnus vulgaris</i>                |
| <b>Family: Motacillidae (Pipits)</b>                   |  |
| American Pipit   | <i>Anthus rubescens</i>                |
| <b>Family: Parulidae (Wood Warblers)</b>               |  |
| Virginia's Warbler                                     | <i>Vermivora virginiae</i>             |
| Yellow Warbler   | <i>Dendroica petechia</i>              |
| Yellow-rumped Warbler                                  | <i>Dendroica coronata</i>              |
| Black-throated Gray Warbler                            | <i>Dendroica nigrescens</i>            |
| Common Yellowthroat                                    | <i>Geothlypis trichas</i>              |
| Wilson's Warbler                                       | <i>Wilsonia pusilla</i>                |
| <b>Family: Thraupidae (Tanagers)</b>                   |  |
| Western Tanager  | <i>Piranga ludoviciana</i>             |
| <b>Family: Emberizidae (Sparrows, Towhees, Juncos)</b> |  |
| Green-tailed Towhee                                    | <i>Pipilo chlorurus</i>                |
| Spotted Towhee   | <i>Pipilo maculatus</i>                |
| American Tree Sparrow                                  | <i>Spizella arborea</i>                |
| Chipping Sparrow                                       | <i>Spizella passerina</i>              |
| Brewer's Sparrow                                       | <i>Spizella breweri</i>                |
| <sup>1</sup> Vesper Sparrow                            | <i>Poocetes gramineus</i>              |
| Lark Sparrow   | <i>Chondestes grammacus</i>            |
| Black-throated Sparrow                                 | <i>Amphispiza bilineata</i>            |
| Sage Sparrow   | <i>Amphispiza belli</i>                |
| Savannah Sparrow                                       | <i>Passerculus sandwichensis</i>       |
| Song Sparrow   | <i>Melospiza melodia</i>               |
| Gambel's White-crowned Sparrow                         | <i>Zonotrichia leucophrys gambelii</i> |
| Mountain W-crowned Sparrow                             | <i>Zonotrichia leucophrys oriantha</i> |
| Dark-eyed Junco (Oregon)                               | <i>Junco hyemalis therburi</i>         |
| Dark-eyed Junco (Gray-headed)                          | <i>Junco hyemalis caniceps</i>         |
| Lapland Longspur                                       | <i>Calcarius lapponicus</i>            |
| <b>Family: Cardinalidae (Grosbeaks, Buntings)</b>      |  |
| Black-headed Grosbeak                                  | <i>Pheucticus melanocephalus</i>       |
| Lazuli Bunting   | <i>Passerina amoena</i>                |
| Indigo Bunting   | <i>Passerina cyanea</i>                |
| <b>Family: Icteridae (Blackbirds, Orioles)</b>         |  |
| <sup>1</sup> Bobolink                                  | <i>Dolichonyx oryzivorus</i>           |
| Red-winged Blackbird                                   | <i>Agelaius phoeniceus</i>             |
| Western Meadowlark                                     | <i>Sturnella neglecta</i>              |
| Yellow-headed Blackbird                                | <i>Xanthocephalus xanthocephalus</i>   |
| Brewer's Blackbird                                     | <i>Euphagus cyanocephalus</i>          |
| Great-tailed Grackle                                   | <i>Quiscalus mexicanus</i>             |
| Brown-headed Cowbird                                   | <i>Molothrus ater</i>                  |
| Bullock's Oriole                                       | <i>Icterus bullockii</i>               |
| Scott's Oriole   | <i>Icterus parisorum</i>               |
| <b>Family: Fringillidae (Finches, Grosbeaks)</b>       |  |
| Gray-crowned Rosy-Finch                                | <i>Leucosticte tephrocotis</i>         |
| <sup>1</sup> Black Rosy-Finch                          | <i>Leucosticte atrata</i>              |
| Cassin's Finch   | <i>Carpodacus cassinii</i>             |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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|                    |                                   |
|--------------------|-----------------------------------|
| House Finch        | <i>Carpodacus mexicanus</i>       |
| Pine Siskin        | <i>Carduelis pinus</i>            |
| Lesser Goldfinch   | <i>Carduelis psaltria</i>         |
| American Goldfinch | <i>Carduelis tristis</i>          |
| Evening Grosbeak   | <i>Coccothraustes vespertinus</i> |

## Family: *Passeridae* (Old World Sparrows)

|               |                          |
|---------------|--------------------------|
| House Sparrow | <i>Passer domesticus</i> |
|---------------|--------------------------|

## Mammals

### Order: *Insectivora* (Insect Eaters)

#### Family: *Soricidae* (Shrews)

|                             |                         |
|-----------------------------|-------------------------|
| Merriam's Shrew             | <i>Sorex meriammi</i>   |
| Dusky Shrew                 | <i>Sorex monticolus</i> |
| Vagrant Shrew               | <i>Sorex vagrans</i>    |
| American Water Shrew        | <i>Sorex palustris</i>  |
| <sup>1</sup> Preble's Shrew | <i>Sorex preblei</i>    |

### Order: *Chiroptera* (Bats)

#### Family: *Vespertilionidae* (Plainnose Bats)

|  |                                  |
|--|----------------------------------|
| <sup>1</sup> California Myotis           | <i>Myotis californicus</i>       |
| <sup>1</sup> Western Small-footed Myotis | <i>Myotis ciliolabrum</i>        |
| <sup>1</sup> Long-eared Myotis           | <i>Myotis evotis</i>             |
| <sup>1</sup> Little Brown Bat            | <i>Myotis lucifugus</i>          |
| <sup>1</sup> Fringed Myotis              | <i>Myotis thysanodes</i>         |
| <sup>1</sup> Long-legged Myotis          | <i>Myotis volans</i>             |
| <sup>1</sup> Yuma Myotis                 | <i>Myotis yumanensis</i>         |
| <sup>1</sup> Western Red Bat             | <i>Lasiurus blossomii</i>        |
| <sup>1</sup> Hoary Bat                   | <i>Lasiurus cinereus</i>         |
| <sup>1</sup> Silver-haired Bat           | <i>Lasionycteris noctivagans</i> |
| <sup>1</sup> Western Pipistrelle         | <i>Pipistrellus hesperus</i>     |
| <sup>1</sup> Big Brown Bat               | <i>Eptesicus fuscus</i>          |
| <sup>1</sup> Townsend's Big-eared Bat    | <i>Corynorhinus townsendii</i>   |
| <sup>1</sup> Spotted Bat                 | <i>Euderma maculatum</i>         |
| <sup>1</sup> Pallid Bat                  | <i>Antrozous pallidus</i>        |

#### Family: *Molossidae* (Freetail Bats)

|  |                              |
|--|------------------------------|
| <sup>1</sup> Brazilian Free-tailed Bat | <i>Tadarida brasiliensis</i> |
|--|------------------------------|

### Order: *Lagomorpha* (Pikas, Hares, Rabbits)

#### Family: *Leporidae* (Hares, Rabbits)

|                           |                               |
|---------------------------|-------------------------------|
| Black-tailed Jackrabbit   | <i>Lepus californicus</i>     |
| Mountain Cottontail       | <i>Sylvilagus nuttalli</i>    |
| <sup>1</sup> Pygmy Rabbit | <i>Brachylagus idahoensis</i> |

### Order: *Rodentia* (Rodents)

#### Family: *Sciuridae* (Squirrels)

|                                |                                  |
|--------------------------------|----------------------------------|
| Least Chipmunk                 | <i>Tamias minimus</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>     |

#### 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>       |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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<sup>1</sup>Dark Kangaroo Mouse      *Microdipodops megacephalus*

**Family: *Heteromyidae* (Kangaroos cont.)**

Ord Kangaroo Rat      *Dipodomys ordii*

Chisel-toothed Kangaroo Rat      *Dipodomys microps*

**Family: *Cricetidae* (Mice, Rats, Voles)**

Western Harvest Mouse      *Reithrodontomys megalotis*

Deer Mouse      *Peromyscus maniculatus*

Piñon Mouse      *Peromyscus truei*

Northern Grasshopper Mouse      *Onychomys leucogaster*

Desert Woodrat      *Neotoma lepida*

Montane Vole      *Microtus montanus*

Long-tailed Vole      *Microtus longicaudus*

Sagebrush Vole      *Lemmyscus curtatus*

Muskrat      *Ondatra zibethica*

**Family: *Zapodidae* (Jumping Mice)**

Western Jumping Mouse      *Zapus princeps*

**Family: *Erethizontidae* (New World Porcupines)**

Porcupine      *Erethizon dorsatum*

**Order: *Carnivora* (Flesh-Eaters)**

**Family: *Canidae* (Dogs)**

Coyote      *Canis latrans*

Gray Wolf      *Canis lupus* (L.E.)

**Family: *Canidae* (Dogs)**

Kit Fox      *Vulpes velox*

Red Fox      *Vulpes vulva*

**Family: *Procyonidae* (Racoons and Allies)**

Ringtail      *Bassariscus astutus*

Common Raccoon      *Procyon lotor*

**Family: *Mustelidae* (Weasels and Allies)**

Ermine      *Mustela erminea*

Long-tailed Weasel      *Mustela frenata*

American Badger      *Taxidea taxus*

Striped Skunk      *Mephitis mephitis*

Western Spotted Skunk      *Spilogale gracilis*

**Family: *Felidae* (Cats)**

Mountain Lion      *Felix concolor*

Lynx      *Lynx lynx* (L.E.)

Bobcat      *Lynx rufus*

**Order: *Artiodactyla* (Hoofed Mammals)**

**Family: *Cervidae* (Deer)**

Rocky Mountain Elk      *Cervus canadensis*

Mule Deer      *Odocoileus hemionus*

**Family: *Antilocapridae* (Pronghorn)**

Pronghorn      *Antilocapra americana*

**Reptiles**

**Order: *Squamata* (Lizards, Snakes)**

**Family: *Iguanidae* (Iguanas and Allies)**

Western Fence Lizard      *Sceloporus occidentalis*

Sagebrush Lizard      *Sceloporus graciosus*

Common Side-blotched Lizard      *Uta stansburiana*

Greater Short-horned Lizard      *Phrynosoma hernandesi*

Desert Horned Lizard      *Phrynosoma platyrhinos*

**Family: *Scincidae* (Skinks)**

Great Basin Skink      *Eumeces skiltonianus*

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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## Family: *Teiidae* (Whiptails)

Western Whiptail                      *Cnemidophorus tigris*

## Family: *Colubridae* (Solid-toothed Snakes)

Ringneck Snake                      *Diadophis punctatus*  
Striped Whipsnake                      *Masticophis taeniatus*  
Great Basin Gopher Snake                      *Pituophis cantenifer deserticola*  
Common Kingsnake                      *Lampropeltis getulus*  
Long-nosed Snake                      *Rhinocheilus lecontei*  
Western Terrestrial Garter                      *Thamnophis elegans*  
Ground Snake                      *Sonora semiannulata*  
Night Snake                      *Hypsiglena torquata*

## Family: *Viperidae* (Vipers)

Great Basin Rattlesnake                      *Crotalus viridis lutosus*

## *Amphibians*

### Order: *Anura* (Frogs and Toads)

#### Family: *Pelobatidae* (Spadefoots)

Great Basin Spadefoot Toad                      *Scaphiopus intermontanus*

#### Family: *Buфонidae* (Toads)

Boreal Toad                      *Bufo boreas boreas*

#### Family: *Hylidae* (Treefrogs)

Pacific Chorus Frog                      *Pseudacris regilla*

*L.E.* = *Locally Extirpated*

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.

<sup>1</sup>Elko District BLM Sensitive Species

\*With the exception of the European Starling, House Sparrow, Eurasian Collared-Dove, Ringed Turtle-Dove 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 and amphibian species are also protected as either game, sensitive, threatened or priority species. For further information on a species status, visit our web site at [NDOW.ORG](http://NDOW.ORG).

Updated: 4/2010 - Peter V. Bradley - Nevada Department of Wildlife - Elko, Nevada.

# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Appendix 9: Mule Deer and Pronghorn Antelope Habitat Ratings

### Warm Creek Allotment

Key Area DW-7-T-01

Crucial winter mule deer habitat rating

|   |                |                    |         |
|---|----------------|--------------------|---------|
| Date: June 13, 2011   |                |                    |         |
| Wildlife Season of Use: Winter  |                |                    |         |
| Big Game Range Name: Warm Creek Crucial Winter  |                |                    |         |
| A. Browse Vigor Rating:   |                |                    |         |
| Key Browse Species:   | PUTR2          |                    |         |
| Age Class Rating:   | Unsatisfactory |                    | 4       |
| Form Class Rating:  | Satisfactory   |                    | 8       |
| B. Forage Quality Rating:   |                |                    |         |
| Diversity Index:  | 0.669          | Rating:            | poor 5  |
| Forage Quantity Adjustment:   | 87.00%         | (Vegetative Cover) | 0       |
|   | <b>OR</b>      |                    |         |
| Forage Quantity Adjustment:   |                | (lbs/ac)           | 0       |
| Total Rating:   |                |                    | 5       |
| C. Cover Rating:  | 45.90%         | Rating:            | good 13 |
| D. Disturbance Rating:  |                |                    | 13      |
| E. Water Distribution Rating:   |                |                    | 16      |
| Comment: Data from June 13, 2011. Diversity index from June 13, 2011. Cover board rating from June 13, 2011, but at 15' from 0' post rather than 50' from center of transect, so this is a conservative cover estimate. |                | Subtotal:          | 59      |
|   |                | Correction Factor: | 1.2     |
|   |                | Total Score:       | 70.80   |
|   |                | Rating:            | Good    |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

Key Area 4349-01

Pronghorn yearlong habitat rating

|   |       |      |
|---|-------|------|
| Date: 15 June 2011  |       |      |
| Wildlife Season of Use:   |       |      |
| Big Game Range Name:  |       |      |
| A. Water Availability Rating:   |       |      |
| Miles to Water (to 1/2 mile)  | 1.25  | 14   |
| B. Vegetation Quality Rating:   |       |      |
| Forbs (to 0.1%):  | 19.9% | 11   |
| Grasses (to 0.1%):  | 18.8% | 9    |
| Shrubs (to 0.1%):   | 61.3% | 3    |
| C. Diversity Index Rating   | 0.93  | 12   |
| D. Vegetation Quantity Rating:  | 1093  | 10   |
| E. Vegetation Height Rating:  | 15    | 10   |
| F. Fence Interference Rating  |       | 2    |
| Total Score:  |       | 71   |
| Rating:   |       | Good |
| Comment: Used data collected on 15 June, 2011. Diversity index is average of values for each individual season to reflect yearlong habitat designation. Vegetation height from ocular estimate. |       |      |

## Snow Water Lake Allotment

Key Area 1

Pronghorn yearlong habitat rating

|  |        |      |
|--|--------|------|
| Date: Oct 1983                                   |        |      |
| Wildlife Season of Use: Yearlong                 |        |      |
| Big Game Range Name:                             |        |      |
| A. Water Availability Rating:                    |        |      |
| Miles to Water (to 1/2 mile)                     | 0.6    | 17   |
| B. Vegetation Quality Rating:                    |        |      |
| Forbs (to 0.1%):                                 | 0.0%   | 0    |
| Grasses (to 0.1%):                               | 100.0% | 20   |
| Shrubs (to 0.1%):                                | 0.0%   | 0    |
| C. Vegetation Quantity Rating:                   | 1469   | 15   |
| D. Vegetation Height Rating:                     | 5      | 5    |
| Total Score:                                     |        | 57   |
| Rating:  |        | Fair |
| Comment: Vegetation height from ocular estimate. |        |      |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

|  |       |      |
|--|-------|------|
| Date: July 1987                                  |       |      |
| Wildlife Season of Use: yearlong pronghorn       |       |      |
| Big Game Range Name:                             |       |      |
| A. Water Availability Rating:                    |       |      |
| Miles to Water (to 1/2 mile)                     | 0.6   | 17   |
| B. Vegetation Quality Rating:                    |       |      |
| Forbs (to 0.1%):                                 | 0.0%  | 0    |
| Grasses (to 0.1%):                               | 98.8% | 20   |
| Shrubs (to 0.1%):                                | 1.2%  | 0    |
| C. Vegetation Quantity Rating:                   |       |      |
|  | 1273  | 15   |
| D. Vegetation Height Rating:                     |       |      |
|  | 5     | 5    |
| Total Score:                                     |       | 57   |
| Rating:  |       | Fair |
| Comment: Vegetation height from ocular estimate. |       |      |

|  |       |      |
|--|-------|------|
| Date: Oct 1992                                   |       |      |
| Wildlife Season of Use: yearlong                 |       |      |
| Big Game Range Name:                             |       |      |
| A. Water Availability Rating:                    |       |      |
| Miles to Water (to 1/2 mile)                     | 0.6   | 17   |
| B. Vegetation Quality Rating:                    |       |      |
| Forbs (to 0.1%):                                 | 1.6%  | 1    |
| Grasses (to 0.1%):                               | 98.4% | 20   |
| Shrubs (to 0.1%):                                | 0.0%  | 0    |
| C. Vegetation Quantity Rating:                   |       |      |
|  | 614   | 10   |
| D. Vegetation Height Rating:                     |       |      |
|  | 5     | 5    |
| Total Score:                                     |       | 53   |
| Rating:  |       | Fair |
| Comment: Vegetation height from ocular estimate. |       |      |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

|  |       |      |
|--|-------|------|
| Date: 2011                                       |       |      |
| Wildlife Season of Use: pronghorn yearlong       |       |      |
| Big Game Range Name:                             |       |      |
| A. Water Availability Rating:                    |       |      |
| Miles to Water (to 1/2 mile)                     | 0.6   | 17   |
| B. Vegetation Quality Rating:                    |       |      |
| Forbs (to 0.1%):                                 | 38.2% | 20   |
| Grasses (to 0.1%):                               | 58.4% | 20   |
| Shrubs (to 0.1%):                                | 3.4%  | 0    |
| C. Vegetation Quantity Rating:                   | 1661  | 15   |
| D. Vegetation Height Rating:                     | 5     | 5    |
| Total Score:                                     |       | 77   |
| Rating:  |       | Good |
| Comment: Vegetation height from ocular estimate. |       |      |

## Key Area 2

### Pronghorn yearlong habitat rating

|   |       |      |
|---|-------|------|
| Date: 1983  |       |      |
| Wildlife Season of Use: pronghorn yearlong                            |       |      |
| Big Game Range Name:  |       |      |
| A. Water Availability Rating:   |       |      |
| Miles to Water (to 1/2 mile)  | 0.25  | 19   |
| B. Vegetation Quality Rating:   |       |      |
| Forbs (to 0.1%):  | 3.6%  | 3    |
| Grasses (to 0.1%):  | 96.2% | 20   |
| Shrubs (to 0.1%):   | 0.2%  | 5    |
| C. Vegetation Quantity Rating:  | 458   | 5    |
| D. Vegetation Height Rating:  | 5     | 5    |
| Total Score:  |       | 57   |
| Rating:   |       | Fair |
| Comment: Used data from 1983. Vegetation height from ocular estimate. |       |      |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

|  |       |      |
|--|-------|------|
| Date: 2011                                       |       |      |
| Wildlife Season of Use: pronghorn yearlong       |       |      |
| Big Game Range Name:                             |       |      |
| A. Water Availability Rating:                    |       |      |
| Miles to Water (to 1/2 mile)                     | 0.25  | 19   |
| B. Vegetation Quality Rating:                    |       |      |
| Forbs (to 0.1%):                                 | 48.4% | 20   |
| Grasses (to 0.1%):                               | 51.6% | 20   |
| Shrubs (to 0.1%):                                | 0.0%  | 0    |
| C. Vegetation Quantity Rating:                   | 604   | 10   |
| D. Vegetation Height Rating:                     | 5     | 5    |
| Total Score:                                     |       | 74   |
| Rating:  |       | Good |
| Comment: Vegetation height from ocular estimate. |       |      |

### Key Area 3

#### Pronghorn yearlong habitat rating

|  |       |      |
|--|-------|------|
| Date: July 1986                                  |       |      |
| Wildlife Season of Use:                          |       |      |
| Big Game Range Name:                             |       |      |
| A. Water Availability Rating:                    |       |      |
| Miles to Water (to 1/2 mile)                     | 0.75  | 17   |
| B. Vegetation Quality Rating:                    |       |      |
| Forbs (to 0.1%):                                 | 2.0%  | 2    |
| Grasses (to 0.1%):                               | 78.1% | 20   |
| Shrubs (to 0.1%):                                | 19.9% | 14   |
| C. Vegetation Quantity Rating:                   | 758   | 10   |
| D. Vegetation Height Rating:                     | 15    | 10   |
| Total Score:                                     |       | 73   |
| Rating:  |       | Good |
| Comment: Vegetation height from ocular estimate. |       |      |

## Snow Water Lake and Warm Creek Allotments S&G Assessment

|  |       |      |
|--|-------|------|
| Date: June 2011                                  |       |      |
| Wildlife Season of Use:                          |       |      |
| Big Game Range Name:                             |       |      |
| A. Water Availability Rating:                    |       |      |
| Miles to Water (to 1/2 mile)                     | 0.75  | 17   |
| B. Vegetation Quality Rating:                    |       |      |
| Forbs (to 0.1%):                                 | 11.6% | 10   |
| Grasses (to 0.1%):                               | 78.1% | 20   |
| Shrubs (to 0.1%):                                | 19.9% | 14   |
| C. Vegetation Quantity Rating:                   | 2256  | 15   |
| D. Vegetation Height Rating:                     | 15    | 10   |
| Total Score:                                     |       | 86   |
| Rating:  |       | Good |
| Comment: Vegetation height from ocular estimate. |       |      |

### Key Area 4

#### Pronghorn yearlong habitat rating

|  |       |      |
|--|-------|------|
| Date: Oct 1992                                   |       |      |
| Wildlife Season of Use: pronghorn yearlong       |       |      |
| Big Game Range Name:                             |       |      |
| A. Water Availability Rating:                    |       |      |
| Miles to Water (to 1/2 mile)                     | 0.5   | 18   |
| B. Vegetation Quality Rating:                    |       |      |
| Forbs (to 0.1%):                                 | 0.4%  | 0    |
| Grasses (to 0.1%):                               | 70.6% | 20   |
| Shrubs (to 0.1%):                                | 29.0% | 19   |
| C. Vegetation Quantity Rating:                   | 288   | 5    |
| D. Vegetation Height Rating:                     | 15    | 10   |
| Total Score:                                     |       | 72   |
| Rating:  |       | Good |
| Comment: Vegetation height from ocular estimate. |       |      |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

|  |       |      |
|--|-------|------|
| Date: June 2011                                  |       |      |
| Wildlife Season of Use: pronghorn yearlong       |       |      |
| Big Game Range Name:                             |       |      |
| A. Water Availability Rating:                    |       |      |
| Miles to Water (to 1/2 mile)                     | 0.5   | 18   |
| B. Vegetation Quality Rating:                    |       |      |
| Forbs (to 0.1%):                                 | 7.6%  | 7    |
| Grasses (to 0.1%):                               | 56.6% | 20   |
| Shrubs (to 0.1%):                                | 35.8% | 5    |
| C. Vegetation Quantity Rating:                   | 1342  | 15   |
| D. Vegetation Height Rating:                     | 15    | 10   |
| Total Score:                                     |       | 75   |
| Rating:  |       | Good |
| Comment: Vegetation height from ocular estimate. |       |      |

# Snow Water Lake and Warm Creek Allotments S&G Assessment

## Appendix 10- Key to Plant Acronyms

| Plant Acronym | Species name*                                | Common name           |
|---------------|--|-----------------------|
| AFF           | -  | annual forb           |
| AGCR          | <i>Agropyron cristatum</i>                   | crested wheatgrass    |
| AGGL          | <i>Agoseris glauca</i>                       | Pale agoseris         |
| AGOSE         | <i>Agoseris</i>                              | agoseris              |
| AGSM          | <i>Agropyron smithii</i>                     | western wheatgrass    |
| AGSP          | <i>Agropyron spicatum</i>                    | bluebunch wheatgrass  |
| ALLIU         | <i>Allium sp.</i>                            | onion                 |
| ANTEN         | <i>Antennaria sp.</i>                        | pussytoes             |
| ARABI2        | <i>Arabis sp.</i>                            | rockcress             |
| ARAR8         | <i>Artemisia arbuscula</i>                   | Low sagebrush         |
| ARARN         | <i>Artemisia arbuscula nova</i>              | black sagebrush       |
| ARENA         | <i>Arenaria sp.</i>                          | sandwort              |
| ARTRW         | <i>Artemisia tridentate<br/>wyomingensis</i> | Wyoming big sagebrush |
| ASMO7         | <i>Astragalus mollissimus</i>                | Wooly mikvetch        |
| ASTER         | <i>Aster sp.</i>                             | aster                 |
| ASTRA         | <i>Astragalus sp.</i>                        | milkvetch             |
| ATRIP         | <i>Atriplex sp.</i>                          | saltbush              |
| BRASS         | <i>Brassica sp.</i>                          | mustard               |
| BRTE          | <i>Bromus tectorum</i>                       | cheatgrass            |
| CALOC         | <i>Calochortus sp.</i>                       | Mariposa lily         |
| CAREX         | <i>Carex sp.</i>                             | sedge                 |
| CASTI2        | <i>Castilleja sp.</i>                        | paintbrush            |
| CHAL9         | <i>Chrysothamnus albidus</i>                 | Alkali rabbitbrush    |
| CHNA2         | <i>Chrysothamnus nauseosus</i>               | rubber rabbitbrush    |
| CHVI8         | <i>Chrysothamnus viscidiflorus</i>           | Douglas rabbitbrush   |
| CIRSI         | <i>Cirsium sp.</i>                           | thistle               |
| COLLO         | <i>Collomia</i>                              | collomia              |
| COPA3         | <i>Collinsia parviflora</i>                  | Blue-eyed Mary        |
| COUM          | <i>Comandra umbellate?</i>                   | bastard toadflax?     |
| CRAC2         | <i>Crepis acuminata</i>                      | Tapertip hawksbeard   |
| CRYPT         | <i>Cryptantha sp.</i>                        | cryptantha            |
| DELPH         | <i>Delphinium sp.</i>                        | larkspur              |
| DESO2         | <i>Descurainia sophia</i>                    | Flixweed tansymustard |
| DESCU         | <i>Descurainia sp.</i>                       | tansymustard          |
| DIST          | <i>Distichlis sp.</i>                        | Saltgrass             |
| ERIOG         | <i>Eriogonum sp.</i>                         | buckwheat             |
| ERPU          | <i>Erigeron puchellus</i>                    | Poor robin fleabane   |
| GAYOP         | <i>Gayophytum sp.</i>                        | Groundsmoke           |
| GERAN         | <i>Geranium sp.</i>                          | geranium              |
| HAGL          | <i>Halogeton glomeratus</i>                  | halogeton             |
| HOJU          | <i>Hordeum jubatum</i>                       | foxtail barley        |

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|       |                                  |                          |
|-------|----------------------------------|--------------------------|
| IVAX  | <i>Iva axillaris</i>             | povertyweed              |
| JUBA  | <i>Juncus balticus</i>           | Baltic rush              |
| JUOS  | <i>Juniperus osteosperma</i>     | Utah juniper             |
| KOCHI | <i>Kochi asp.</i>                | kochia                   |
| LEPID | <i>Lepidium sp.</i>              | pepperweed               |
| LEPTO | <i>Leptochloa sp.</i>            | sprangletop              |
| LEPU  | <i>Leptodactylon pungens</i>     | Common pricklygilia      |
| LOMAT | <i>Lomatium sp.</i>              | biscuitroot              |
| LUPIN | <i>Lupinus</i>                   | lupine                   |
| MUAS  | <i>Muhlenbergia asperifolia</i>  | alkali muhly             |
| MURI  | <i>Muhlenbergia richardsonis</i> | mat muhly                |
| ORHY  | <i>Oryzopsis hymenoides</i>      | Indian ricegrass         |
| ORTHO | <i>Orthocarpus sp.</i>           | owlclover                |
| PENST | <i>Penstemon sp.</i>             | penstemon                |
| PHHO  | <i>Phlox hoodii</i>              | spiny phlox              |
| PHLO2 | <i>Phlox longifolia</i>          | Longleaf phox            |
| POA   | <i>Poa sp.</i>                   | bluegrass                |
| POJU  | <i>Poa juncifolia</i>            | alkali bluegrass         |
| POMO5 | <i>Polypogon monspeliensis</i>   | rabbitfootgrass          |
| PONE3 | <i>Poa nevadensis</i>            | Nevada bluegrass         |
| POSE  | <i>Poa secunda</i>               | Sandberg bluegrass       |
| POTEN | <i>Potentilla sp.</i>            | cinquefoil               |
| PPFF  | Perennial forb--                 | Perennial forb           |
| PPGG  | Perennial grass--                | Perennial grass          |
| RATE  | <i>Ranunculus testiculatus</i>   | Bur buttercup            |
| SENEC | <i>Senecio sp.</i>               | groundsel                |
| SIHY  | <i>Sitanion hystrix</i>          | bottlebrush squirreltail |
| SPAI  | <i>Sporobolus airoides</i>       | Alkali sacaton           |
| SPGR  | <i>Spartina gracilis</i>         | alkali cordgrass         |
| STTH2 | <i>Stipa thurberiana</i>         | Thurber's needlegrass    |
| SUEDA | <i>Suaeda?</i>                   | seepweed?                |
| TAOF  | <i>Taraxacum officinale</i>      | Common dandelion         |
| TECA2 | <i>Tetradymia canescens</i>      | Spineless horsebrush     |
| TRCO  | ??                               | ??                       |
| TRIGL | <i>Triglochin sp.</i>            | arrowgrass               |
| ZIGAD | <i>Zigadenus sp.</i>             | deathcamas               |

\*Many species names shown here have changed; for consistency, this list reflects older names.

# Snow Water Lake and Warm Creek Allotments S&G Assessment

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