GREAT DIVIDE BASIN/FERRIS MOUNTAIN AND SEMINOE MOUNTAIN WATERSHEDS STANDARDS AND GUIDELINES ASSESSMENT

Rawlins Field Office

2012 Field Season

Document for Agency, Permittee and Interested Public Review

September 2013

High Desert District – Rawlins Field Office, Wyoming

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

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Bureau of Land Management

Rawlins Field Office

2013 Standards and Guidelines Assessment

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I have reviewed the Standards and Guidelines Assessment for the Great Divide Basin/Ferris and Seminoe Mountain Watersheds. I concur with the evaluation procedures and with the conclusions and recommendations of the review team with respect to each of the six Rangeland Standards. Based on this report, a determination will be prepared and transmitted to the appropriate parties.

Dennis Carpenter, Field Manager	**Date** 9/30/13

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Acknowledgments

The Bureau of Land Management (BLM), Rawlins Field Office (RFO), would like to thank the Saratoga-Encampment-Rawlins Conservation District (SERCD) for their long-term commitment to resource enhancement and partnering with the BLM in management, monitoring, and project development. The BLM would also like to thank the Wyoming Game and Fish Department (WGFD) for their long-term collaboration with the BLM in fisheries and wildlife management, riparian monitoring, vegetation treatments (particularly on Ferris and Seminoe Mountains), bighorn sheep augmentation, and supporting needed research. In addition, there are other individuals, groups, and agencies that the RFO works with or have provided funding in the support of management, monitoring, or improvements that the RFO wishes to thank for their assistance in improving BLM-administered public lands.

INTRODUCTION

The original watershed assessment for the Great Divide Basin, Ferris Mountain, and Seminoe Mountain watershed areas within the RFO was completed 10 years ago (2003). This document is available for review online at: http://www.blm.gov/wy/st/en/field_offices/Rawlins/range/standards02.html .

Paper copies of the assessment are available for review at the RFO. It will be referenced and portions briefly summarized in this document.

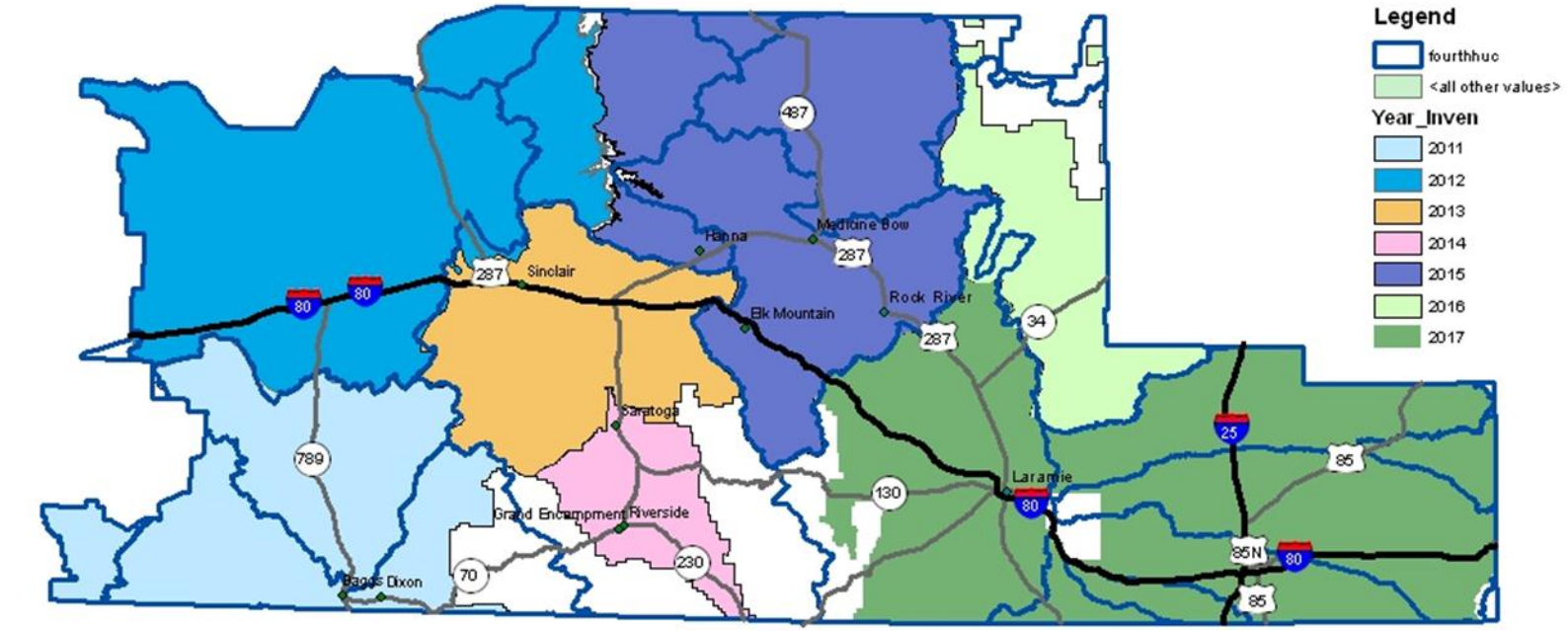
The RFO includes 3.5 million acres of public land; therefore, a watershed level assessment process encourages a more efficient approach than an allotment level assessment. This approach, rather than at an allotment basis, enables the RFO to manage landscapes holistically while meeting the BLM's multiple use mandate. In addition, there are a number of other benefits to this type of approach. First, every region within the RFO gets reviewed every 10 years, so the BLM can evaluate what was accomplished, what still needs to be done, and what new issues have arisen that need to be addressed. Second, the larger and more important issues needing to be addressed are focused upon, providing more time to take corrective actions and monitor results. Third, the landscape scale works for all disciplines, from watersheds for hydrologists to herd areas for wildlife biologists to allotments for range specialists, as well as for the variable mixture of BLM partners. Fourth, it provides a priority for planning BLM future workloads and monitoring in order for the BLM to secure funding, as well as providing BLM partners a look at BLM's path ahead, and accountability to the public. This is the second watershed assessment out of the seven evaluation areas the RFO has been divided into, with the initial report having been completed in 2003 and the current one in 2013. There were approximately 200 transects and over 600 photo-points retaken; available for review at the RFO.

BACKGROUND

The RFO has been divided into seven watershed units, which are being assessed every 10 years, with the Great Divide Basin, Ferris Mountain, and Seminoe Mountain being the second watershed report completed in each cycle (Map #1). The analysis area occupies 2,084,000 acres in Carbon and Sweetwater counties in south-central Wyoming. Land ownership consists of 63 percent federal lands, 32 percent private lands, and 4 percent state lands (Map #2).

This watershed contains the Ferris Mountain Wilderness Study Area (WSA), the Antelope Hills, Lost Creek, and Stewart Creek Wild Horse Herd Management Areas (WHHMA), the Blowout Penstemon Area of Environmental Concern (ACEC), the Chain Lakes Wildlife Habitat Management Area (WHMA), the Red Rim-Daley WHMA, the Jep Canyon WHMA, the Shamrock Hills Raptor Concentration Area, part of the Continental Divide National Scenic Trail, and two historic trails – Rawlins to Fort Washakie and Rawlins-to-Baggs (BLM 2008). There are multiple gas field developments within the area, including Atlantic Rim, Creston-Blue Gap, Seminoe, Pickett Lake, Hay Reservoir, Wind Dancer, Lost Soldier, Wertz, and Continental Divide (Wamsutter). There are 50 allotments permitted for grazing use split between cattle (93 percent), sheep (6 percent) and horses (1 percent) (Map #3 and Exhibit "A").

Map 1 Watershed Assessment Area By Year



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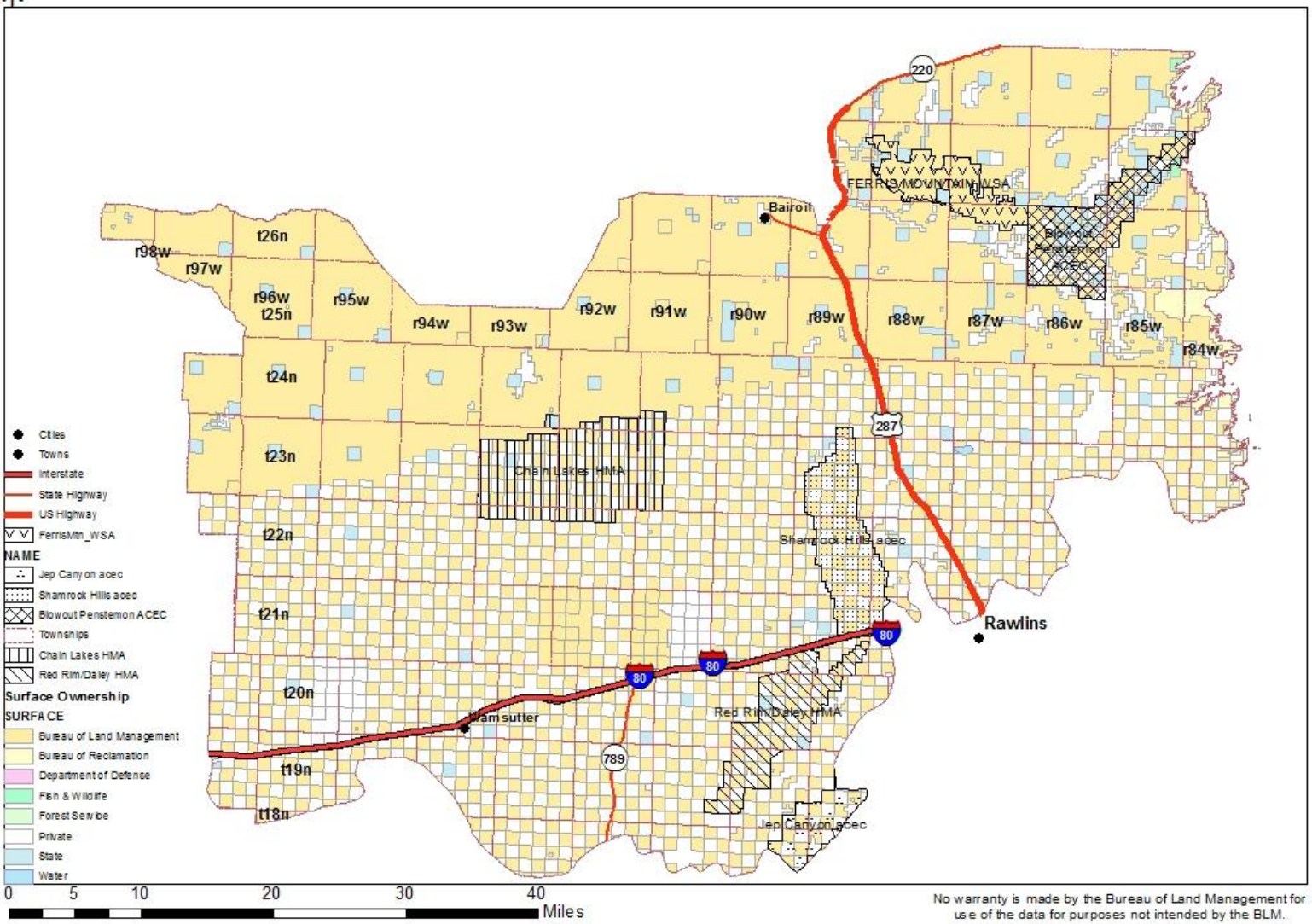
Map 2 - Land Ownership and Special Management Areas



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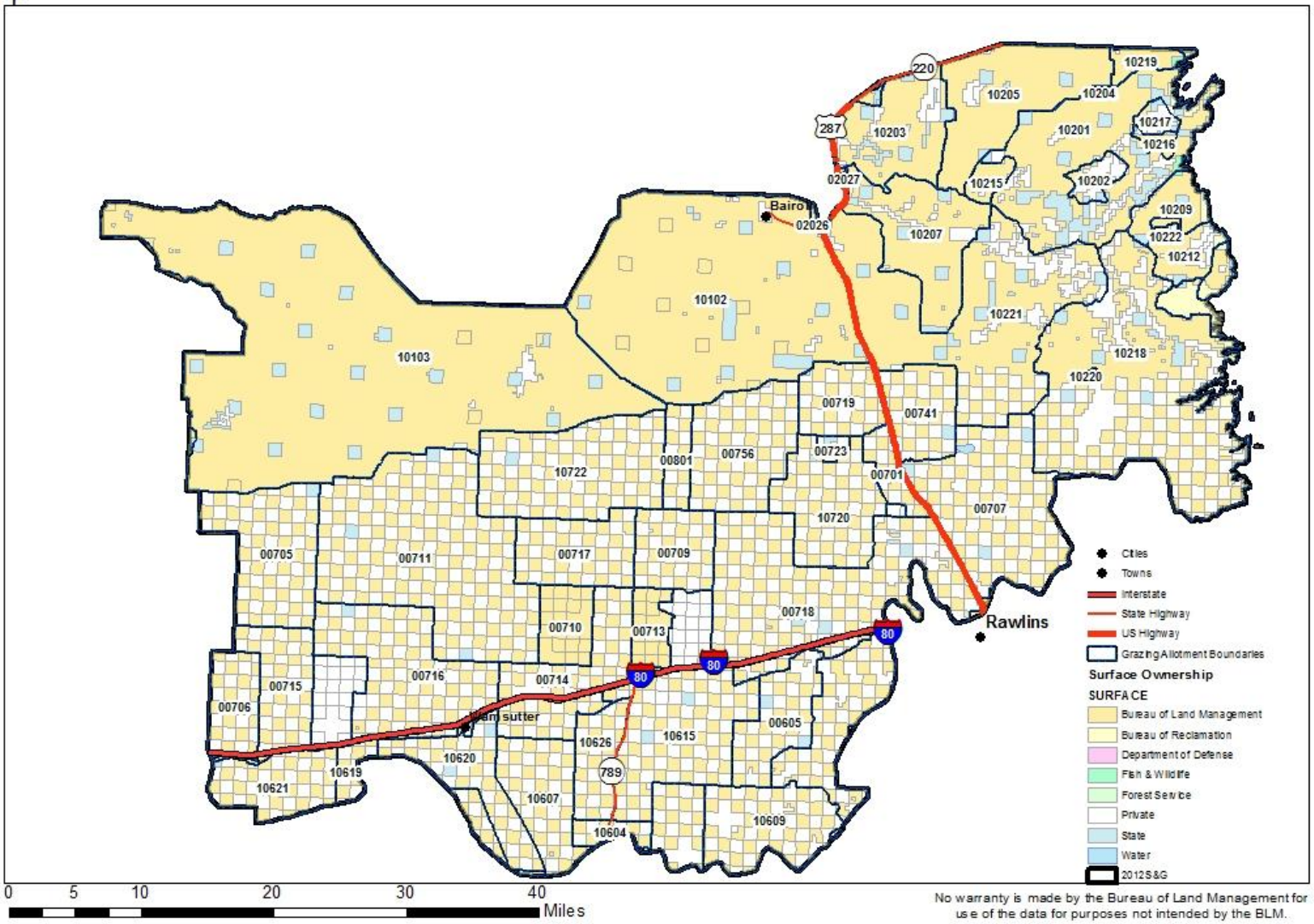
Map 3 - Livestock Grazing Allotments



The 1996 rangeland reform process modified the grazing regulations to address the fundamentals of rangeland health. In August 1997, the *Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for the Public Lands Administered by the Bureau of Land Management in the State of Wyoming* was approved by the Wyoming State Director. The objectives of the rangeland health regulations were to "promote healthy sustainable rangeland ecosystems; to accelerate restoration and improvement of public rangelands to properly functioning conditions…and to provide for the sustainability of the western livestock industry and communities that are dependent upon productive, healthy public rangelands." The fundamentals of rangeland health combine the basic precepts, or physical function and biological health, with elements of law relating to water and air quality, and plant and animal populations and communities. Initially the standards focused on livestock grazing on BLM-Administered lands, but the current standards were developed to apply to all uses and resources.

In January 2001, Instruction Memorandum (IM) No. 2001-079, *Guidance for Conducting Watershed-Based Land Health Assessments*, was issued. This IM transmitted the 4180 Manual Section and H-4180-1, Rangeland Health Standards, and provides guidance for conducting assessments and evaluations for ascertaining rangeland health on a watershed basis. Under Policy/Action it states: "The Field Offices are to consider all assessment requirements for the watershed being assessed and select methods which will provide information needed to fulfill those requirements. When a field office invests its resources in an assessment, the end product should substantially meet all assessment needs to avoid conducting multiple assessments for multiple needs. For example, a well-planned, watershed-based assessment can provide the information needed for allotment evaluations, biological assessments for Section 7 Endangered Species Act consultation, and developing habitat management plans, Water Quality Improvement Plans for Total Maximum Daily Loads on impaired waters, and watershed restoration actions."

The standards are the basis for assessing and monitoring rangeland conditions and trends. The assessments evaluate the standards, and are conducted by an interdisciplinary team with participation from permittees and other interested parties. Assessments are only conducted on BLM-Administered public lands, however, interpretation of watershed health and water quality may reflect upon all land ownerships within the area of analysis. The six standards are as follows:

Standard 1 – Watershed Health: *Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.*

> The standard is considered met if upland soil cover generally exceeds 30 percent and obvious signs of soil erosion are not apparent, and stream channels are stable and improving in morphology.

Standard 2 – Riparian/Wetland Health: *Riparian and wetland vegetation have structural, age, and species diversity characteristic of the state of channel success and is resilient and capable of recovering from natural and human disturbance in order to provide forage and cover, capture sediment, dissipate energy, and provide for ground water recharge.*

> The standard is considered met if riparian/wetland habitat is rated in Proper Functioning Condition (PFC) and existing management will lead to maintaining or improving resource conditions.

Standard 3 – Upland Vegetation Health: *Upland vegetation on each ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance.*

The standard is considered met if plant communities are sustaining themselves under existing conditions and management.

Standard 4 – Wildlife/Threatened and Endangered (T&E) Species Habitat Health, Fisheries, Weeds: *Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.*

The standard is being met if habitat needed to support wildlife and fishery species is being sustained under existing conditions and management. Existing populations or new locations with weeds are being treated in a timely manner.

Standard 5 – Water Quality: *Water quality meets state standards.*

The standard is considered unknown unless information provided by the state of Wyoming determines the status of a water body as impaired (not meeting) or is meeting its beneficial uses.

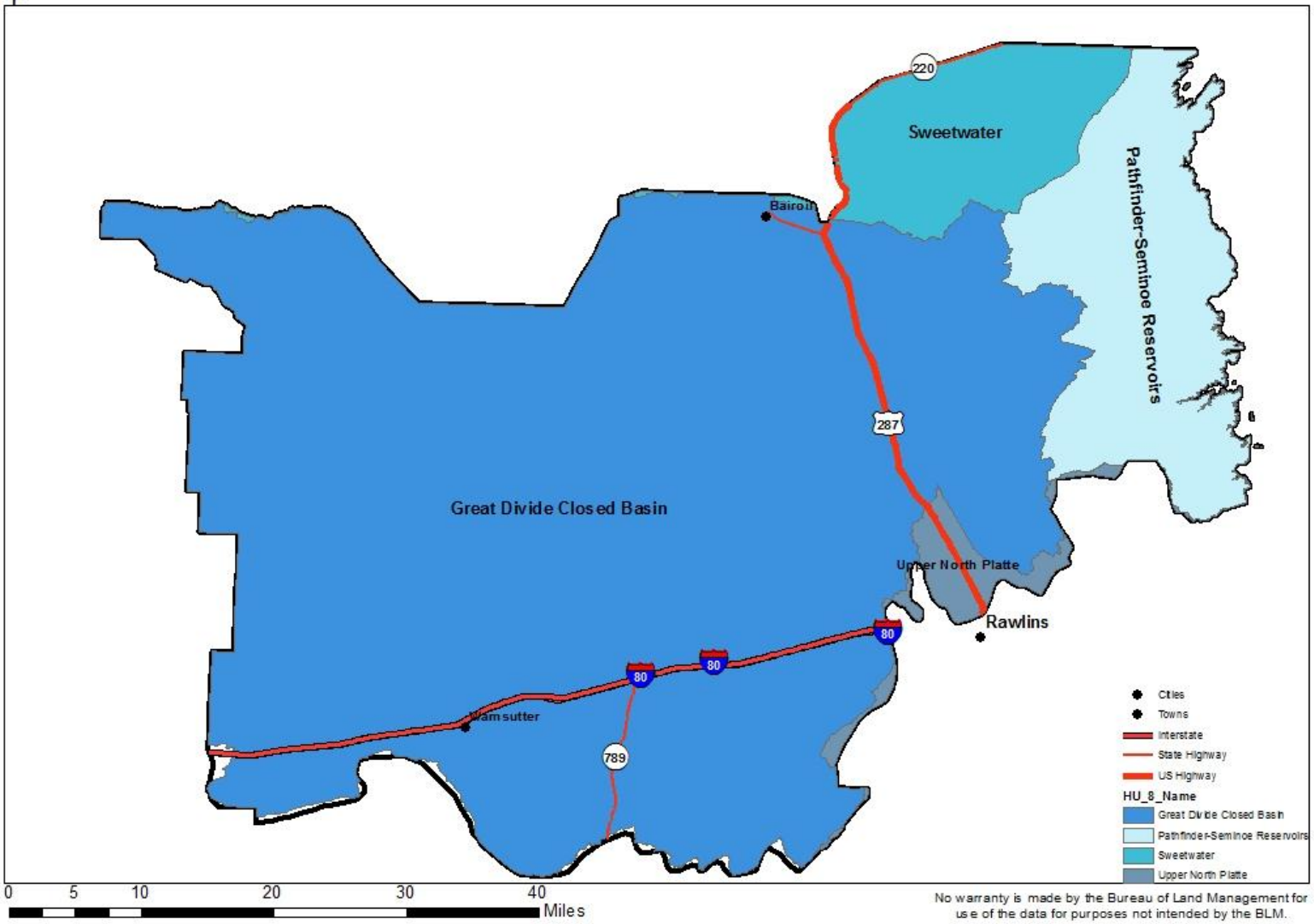
Standard 6 – Air Quality: *Air quality meets state standards.*

The standard is considered met or impaired based on information provided by the state of Wyoming.

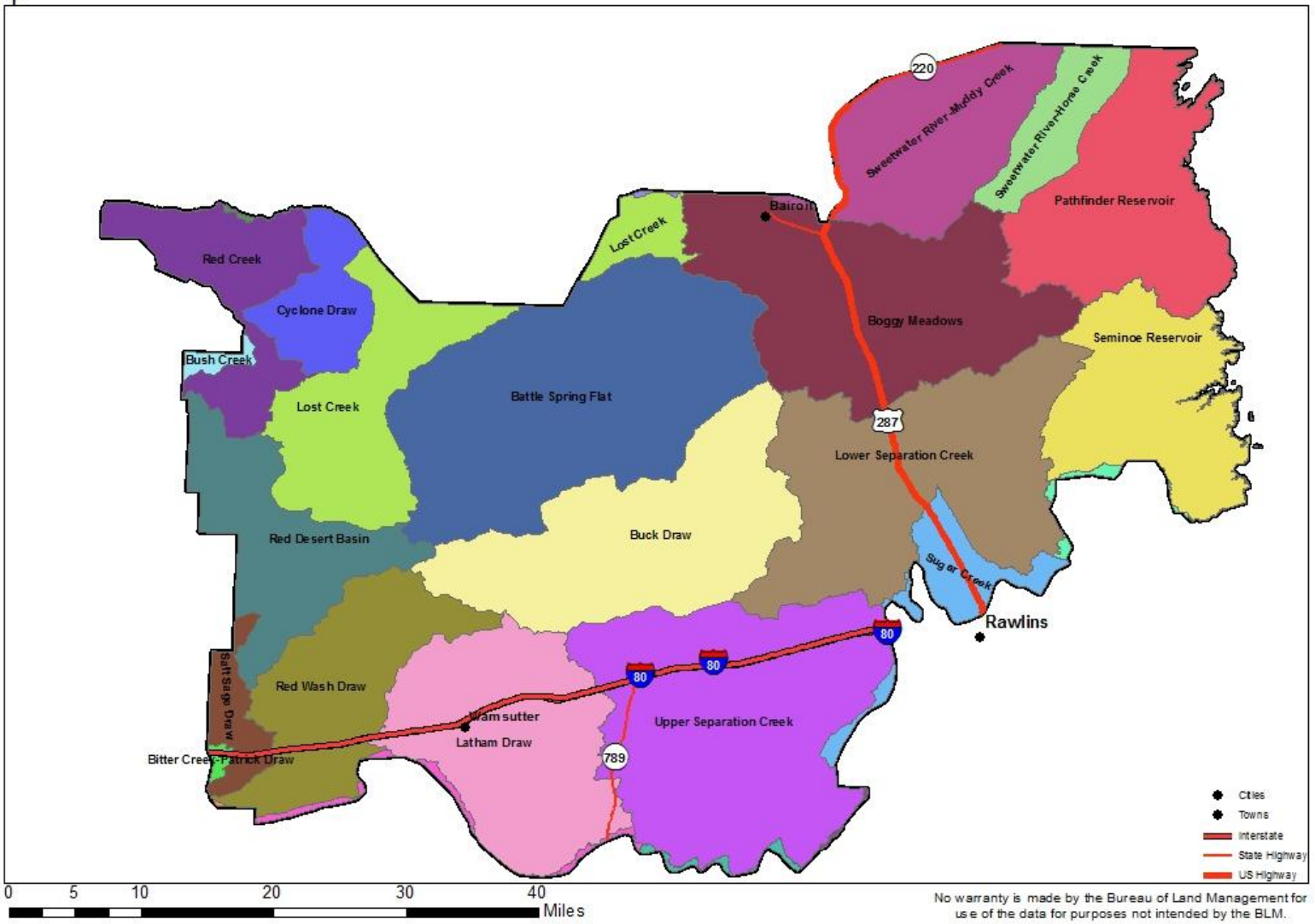
If an assessment showed that a standard(s) were not being met, factors contributing to the non-attainment would be identified and management recommendations developed so the standard could be attained. If livestock are contributing to the non-attainment of a standard, as soon as practical but no later than the start of the next grazing season, management practices would be implemented to ensure that progress was being made toward attainment of the standard(s). The rangeland standards established a threshold; however, the desired resource condition will usually be at a higher level than the threshold.

The framework for this report will be a discussion of each rangeland standard in the order described above. The outline of the discussion for each standard will follow the six-step process for ecosystem analysis at the watershed scale. The six steps are: 1) Characterization of the watershed; 2) Identification of issues and key questions; 3) Description of current conditions; 4) Description of reference conditions; 5) Synthesis and interpretation of information; and 6) Recommendations. Core topics will be discussed under the appropriate standard, with erosion processes, hydrology, and stream channels under Standard 1; vegetation divided into either wetland/riparian or upland under Standards 2 and 3; species and habitats, along with weeds, under Standard 4; and water and air quality under Standards 5 and 6. Human uses would be discussed under each Standard where appropriate. Standard 1- Watershed Health has been divided into four descriptions for different hydrologic units, while Standards 2 through 6 are described as one unit encompassing the entire Great Divide Basin, Ferris Mountain, and Seminoe Mountain watershed (Map #4 and Map #5).

Map 4 - Watersheds



Map 5 - Fifth Order Watersheds



MANAGEMENT CHANGES BETWEEN 2003 AND 2012

Wyoming Landscape Conservation Initiative (WLCI) – In 2007 the WLCI was implemented following initial discussions between Wyoming BLM, the U.S. Fish and Wildlife Service (FWS), and WGFD. The WLCI is a long-term science-based effort to assess and enhance aquatic and terrestrial habitats at a landscape scale in Southwest Wyoming, while facilitating responsible development through local collaboration and partnerships. Within this watershed, the WLCI has funded projects involving fence conversions, prescribed burning, and weed control.

Rawlins Resource Management Plan (RMP) – December 24, 2008 the Record of Decision (ROD) was signed by the BLM for implementing a new land use plan for the nearly 3.6 million acres of public lands within the RFO. It replaced the previous RMP approved in 1990 and added several new management areas, including creation of the Blowout Penstemon ACEC, and the Chain Lakes, Red Rim/Daley, and Shamrock Hills WHMAs. The Chain Lakes and Red Rim/Daley WHMAs are managed cooperative with the WGFD, who own the private lands, within these two habitat units. They include winter habitat for antelope and mule deer, alkaline wetlands important for migratory birds, as well as upland and riparian habitat used by a variety of wildlife. The Shamrock Hills area is a raptor concentration area, used by ferruginous hawks, golden eagle, prairie falcon and kestrels.

Blowout Penstemon ACEC – In 2008 the Rawlins RMP established the Blowout Penstemon ACEC. The management goals established for this ACEC are to manage the endangered blowout penstemon plant and its habitat. At this time the RMP is under a VRM/ACEC remand and is required to reconsider the Ferris Dunes area as a nomination for an ACEC. This area overlaps the existing Blowout Penstemon ACEC area. This reconsideration has led the BLM to re-analyze the Blowout Penstemon ACEC to incorporate a portion of this new area.

Antler Collection Regulation (WGFD Chapter 61) – This policy was established in 2009 by the WGFD which made it illegal for people to collect shed antlers west of the Continental Divide from January 1 through April 30 to reduce stress and harassment to big game on crucial winter ranges when the animals may be weakest. Since many people collect antlers using Off-Highway Vehicles (OHVs), a side benefit should be reduced off-road driving during wet periods in the late winter and early spring when it is more likely to create ruts and increase soil erosion.

Daley/Grizzly Habitat Management Areas – In April 2010 a revised Memorandum of Understanding (MOU) was signed by the WGFD, BLM, and Conservation Districts, which modified management strategies in these two areas. The primary goal of managing these areas as wildlife habitat/livestock grazing demonstration areas has continued but was expanded to increase the benefits to fish and wildlife habitat beyond the Daley/Grizzly borders.

Greater Sage-Grouse Management Policy – This policy has evolved based on on-going research over the last 20 years, and more recently due to Wyoming State implementation of a core area strategy and the FWS 2010 "Warranted, But Precluded" status for the bird. The Sage-Grouse Habitat Assessment Framework issued in 2010 is being used, in addition to Wyoming policies that address energy development, livestock grazing, vegetation treatments, water developments, and other actions that can potentially affect the species. In 2011, the state of Wyoming released an executive order (EO 2011-005) outlining protection for Greater Sage-Grouse under a core habitat area concept. The BLM subsequently released IM WY-2012-019 providing further guidance to BLM Wyoming (BLM WY) Field Offices (FOs) regarding management considerations of Greater Sage-Grouse habitats, including the core area concept for proposed activities.

Lost Creek Uranium In-Situ Recovery (ISR) Project – In 2012 a ROD was signed by the BLM for the ISR of uranium in Sweetwater County, approximately 36 miles northwest of Rawlins. The project area included

4,254 acres, with an estimated total surface disturbance of 345 acres. The project area straddles the border with the BLM Lander Field Office with about 3,384 acres of the project being in the RFO.

CLIMATE BETWEEN 2003 AND 2012

The following discussion of climate from 2003 to 2012 is based on National Weather Service (NWS) data for Rawlins, Wamsutter, Seminoe Dam, and Muddy Gap, as well as BLM rain gauges spread across the watershed. Although the BLM rain gauges are not as accurate as information from the NWS, general annual trends in precipitation are representative of local conditions.

The long-term average annual precipitation for Wamsutter is 6.8 inches, 9.6 inches for Rawlins, 10 inches for Muddy Gap, and an average 12.7 inches for Seminoe Dam. The BLM rain gauges in the desert generally fall within the 7 to 9 inch Natural Resources Conservation Service (NRCS) ecological site descriptions (ESD) for the area, with sites in the foothills and near the isolated mountain ranges corresponding to a 10 to 14 inch ESD area. Figure 1 shows the annual precipitation amounts for the Rawlins and Seminoe Dam NWS Stations. Figure 2 shows annual precipitation amounts at the Raymond Ranch Road (located about 33 miles north of Rawlins), Daley (located about 17 miles west of Rawlins), and Eagles Nest (located about 45 miles northwest of Rawlins), which are BLM precipitation gauge sites. At middle to higher elevations, wind-blown snow deposition occurs on north to east facing slopes increasing effective moisture levels.

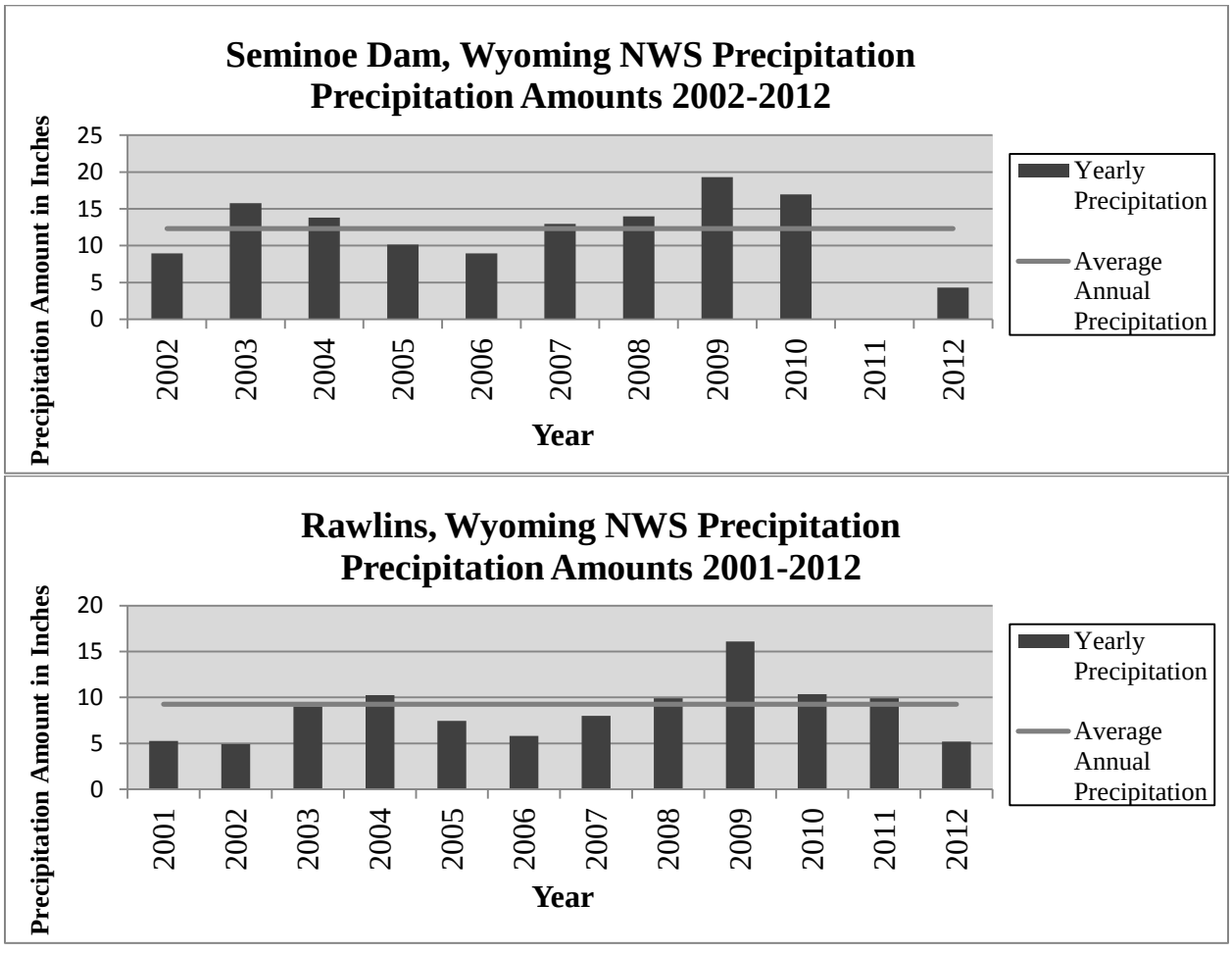


Figure 1: Recorded Precipitation at Rawlins and Seminoe Dam, Wyoming (National Weather Service)

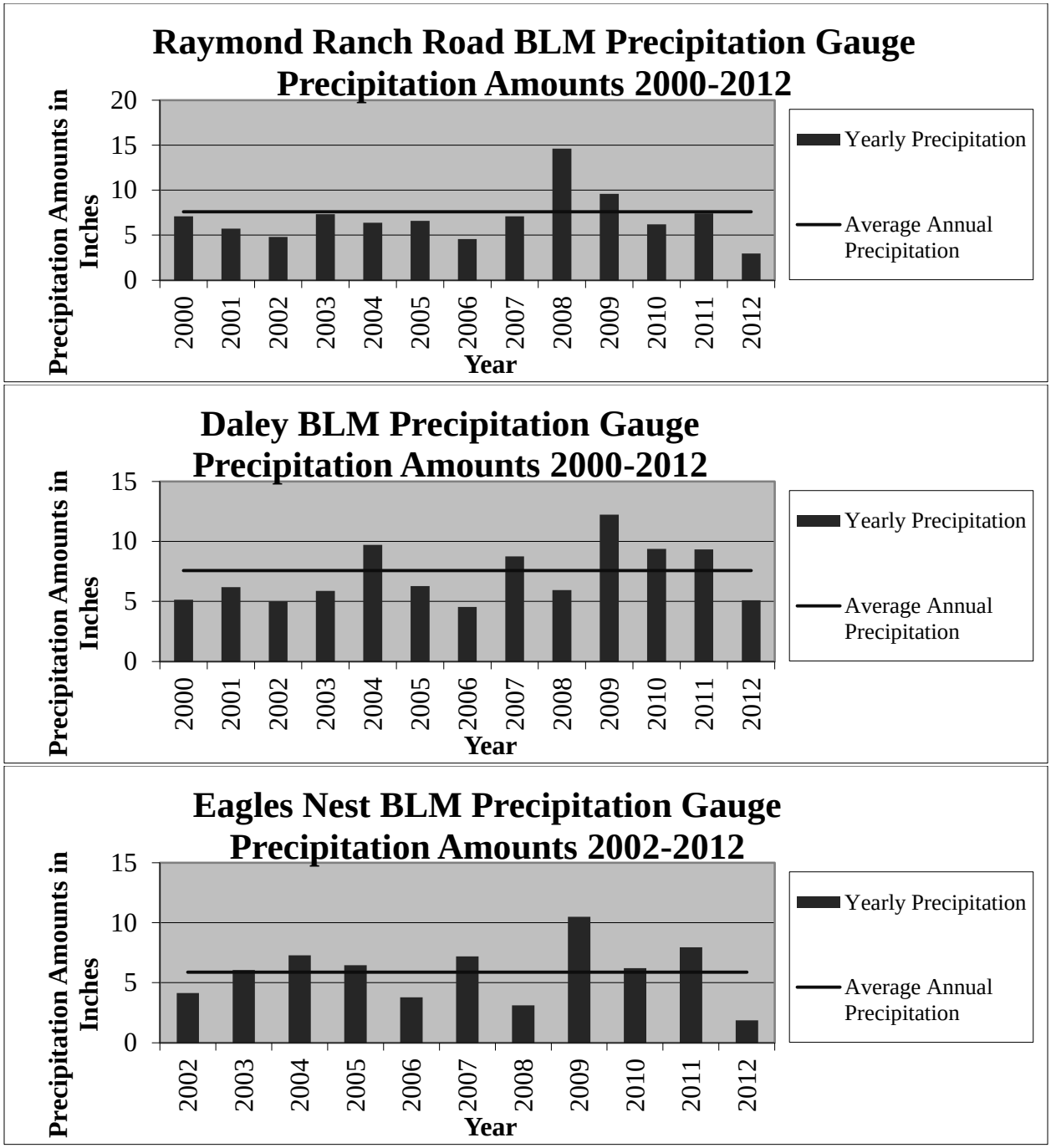


Figure 2: Recorded Precipitation at Selected BLM Precipitation Gauges (Bureau of Land Management)

NWS data over the last 60 years for Rawlins was used as a base for comparison and the range of 95-105 percent was considered average; from 2003 to 2012 five years were wetter than average, four years were below average, and one year received average levels of precipitation. The Seminoe NWS was similar, but information for 2011 was incomplete. The BLM precipitation gauges varied, having as many as six years above average to as few as one year with above average precipitation, from three to six years with below average precipitation, and from five years to zero with average precipitation. In general, 2006 and 2012 were the driest years, and 2009-2011 was a three year wet period with either 2009 or 2011 being the wettest depending upon location. In Rawlins the wettest year was 2009 with 16.1 inches, or 175 percent of normal (wettest year ever recorded), and the driest year was 2012 with 5.19 inches or 56 percent of normal (third driest ever recorded). The second driest year recorded in

Rawlins was just outside the 10 year period, in 2002 with 4.94 inches, or 53 percent of average. The wettest year recorded at Seminoe Dam was 2009 with 19.29 inches of precipitation, or 157 percent of average, while 2012 was the driest year with 4.32 inches recorded, or 35 percent of normal.

Temperature trends for Rawlins have been increasing since recording began; however, the last decade has been trending cooler than the previous. Even so, 2012 was the warmest year recorded. The coldest year was 2008, which was the 28th coldest year recorded.

Annual vegetation production is related to amount of precipitation, particularly during the primary growing season (generally precipitation in this area occurs between March and June, depending on location and elevation). The RFO in conjunction with the University of Wyoming began collecting herbaceous production information to correlate with climate beginning in 2006. Figure 3 shows an example of this relationship within the Fillmore Allotment on the south side of the watershed from 2006 to 2013. Forage production in 2006, 2012, and 2013 was below average as was precipitation. Forage production and precipitation were close to average in 2007 and 2011, while forage production and precipitation were above average in 2008, 2009, and 2010. The data showed the wettest year in 2009 correlated to 60 percent above average forage production as compared to the driest year in 2012, which correlated to 21 percent of average forage production.

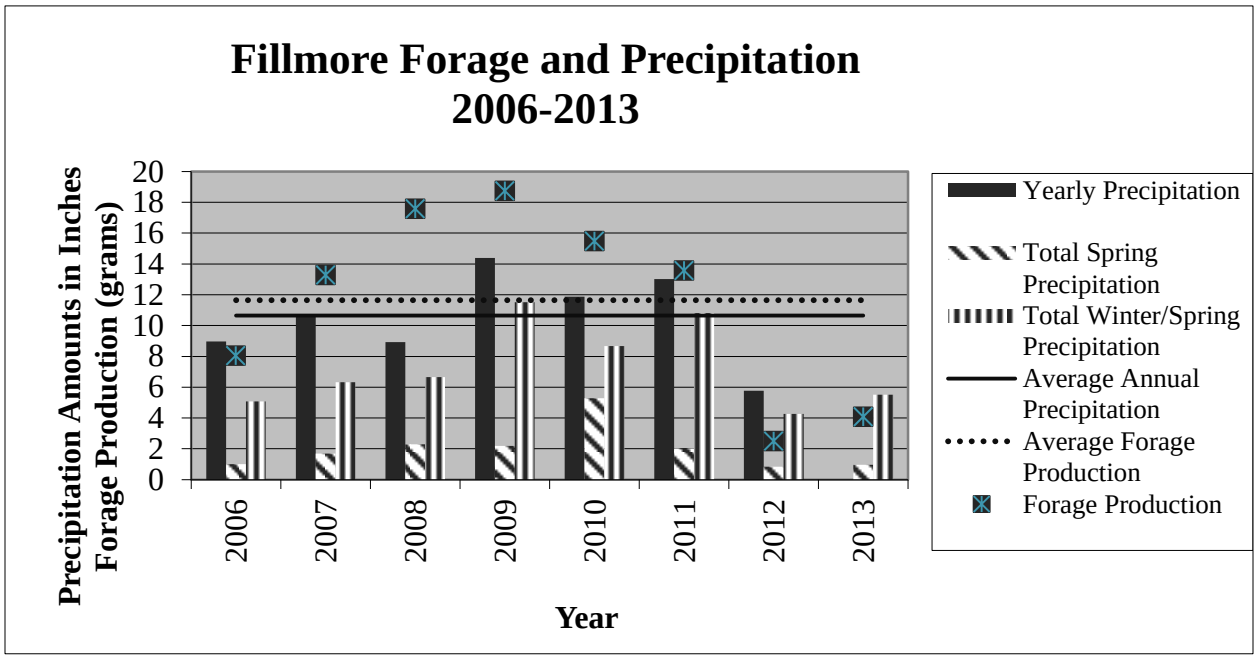


Figure 3: Recorded Precipitation and Forage Production within the Fillmore Allotment (BLM)

SUMMARY OF STANDARDS THAT FAILED IN 2003

Standard #1 (Watershed health) failed due to livestock grazing for the Buzzard and Cherry Creek allotments.

Standard #2 (Riparian/wetland health) failed due to livestock grazing for the following allotments: Buzzard, Cherry Creek, Cyclone Rim, Ferris Mountain, Jawbone, Long Creek, Seminoe, Stewart Creek, and Wood Creek. This standard also failed due to wild horse use at the following locations: Kinch-McKinney Spring and Olson and Olson Reservoir in the Antelope Hills WHMA, and lower Stewart Creek in the Stewart Creek WHMA.

Standard #3 (Upland plant health) failed for all aspen plant communities in the Ferris and Seminoe Mountains and spot locations elsewhere in the watershed.

Standard #4 (Wildlife, T&E Species Habitat, Fisheries, Weeds) was failed under wildlife habitat for the shrub and woodland habitat in the Ferris and Seminoe Mountains totaling 24,000 acres. Streams that did not meet Standard #2 and were capable of supporting fish populations also failed this standard under fisheries habitat. Expansion of noxious weeds on 2,400 acres, including Russian knapweed and leafy spurge, into native rangelands due to lack of control also failed this standard.

STANDARD 1 – WATERSHED

> *Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.*

The analysis area contains the Great Divide Basin and portions of the North Platte River Basin within the RFO boundary (Maps #4 and #5). Table #1 depicts the 4th Order HUCs, acreages, and groupings of these watersheds that will be discussed for Standard 1.

Table # 1 – Sub-Area Acreage Included in the Analysis Area

Sub-Area (report sections)	**Acreage**	**4th Level Hydrologic Unit Code**
Great Divide Basin (without Upper/Lower Separation Creek/Boggy Meadows)	1,036,000	14040200 - Great Divide Closed Basin
Upper/Lower Separation Creek/Boggy Meadows (portion of Great Divide Basin)	617,000	
Sweetwater River (RFO)	145,000	1018006 - Sweetwater
North Platte River Basin other than Sweetwater River	287,000	10180002 – Upper North Platte 10180003 – Pathfinder – Seminoe Reservoir
Total	2,084,000	

Great Divide Basin (Without Upper/Lower Separation Creek, Boggy Meadows)

1) Characterization

The Great Divide Basin includes these fifth order watersheds: Battle Springs Flat, Buck Draw, Bush Creek, Cyclone Draw, Latham Draw, Lost Creek, Red Creek, Red Desert Basin, Red Wash Draw, and Salt Sage Draw. These watersheds are very similar in nature and all contain ephemeral drainages. The majority of the area is in a 7 to 9- inch precipitation zone, increasing to around 10 inches at the higher elevations, with predominantly shale and sandstone derived soils, which can produce high runoff with moderate to severe erosion potential. Topography is dominated by flat to gently rolling landscapes, becoming moderately-steep to steep close to rims and badlands. Flows are erratic and short-term, with no recording of perennial flows. At the terminus of creek systems are large flats or playa lakes such as Hay Reservoir for Red Creek and Lost Creek Lake for Lost Creek. Approximately half of the watershed lies within the checkerboard land ownership pattern, with about three-quarters of the area being BLM-Administered public lands. The only site with stream flow where channel classification was determined was along portions of Lost Creek, which is a D5 stream type.

Principal human uses in the watershed are natural gas development, livestock grazing, and recreation. Natural gas development has been occurring in the area for many years; however, it has expanded in scope to include in-field drilling over the last 20 years. Well density has reached 40-acre spacing in some areas near Wamsutter, whereas in most other areas, 160-acre spacing is more common. Livestock use includes cattle much of the year and sheep during the winter. Recreation is largely related to hunting, primarily during the fall (September through October).

2) Issues and Key Questions

The issues and key questions discussed in 2003 are still relevant in 2013. Issues involved oil and gas development, livestock grazing, erosion, and wild horses. For gas field development, the key questions are: How does development and reclamation of leased gas fields need to be improved to meet watershed and wildlife habitat health standards? There is expanded use of multi-well drill pads, which can reduce surface disturbance by up to 75 percent, so the key question is, why is there not more support for this type of development?

3) Current Conditions

Due to the ephemeral nature of this drainage, no quantifiable data about stream flow is being collected. Range conditions and trend are being assessed through photo-points, upland transects, and personal observations.

The principle trend data is either from saltbush steppe or big sagebrush key areas, the two most prevalent vegetation types in the Great Divide Basin. The Echo Springs, Lazy Y-S Ranch, and South Wamsutter allotments are located south and east of Wamsutter, and are used from spring through fall, with eight pastures to rotate cattle grazing. Sheep grazing has also occurred in these allotments in the past, most recently during the winter. Using transect information from 1995 to 2012, the bare ground decreased from 61 percent to 56 percent on a saltbush site, and from 38 percent to 31 percent on a sagebrush site in Echo Springs, from 37 percent to 28 percent on sagebrush sites in Lazy Y-S Ranch, and from 57 percent to 48 percent on saltbush sites in South Wamsutter.

The Stewart Creek allotment comprises about 176,000 acres, support cattle grazing and the Stewart Creek WHHMA, and lies within approximately 60 percent in the Great Divide Basin report area and 40 percent of the Upper and Lower Separation Creek/Boggy Meadows report area. The portion within the Great Divide Basin is dominated by Wyoming and mountain big sagebrush and mixed grasses and forbs, with lower elevations in the 7 to 9 inch precipitation zone and higher elevations in the 10 to 14 inch precipitation zone. Soils in the Great Divide Basin are generally sandy clay loams becoming rockier at Lost Soldier and Bulls Creek rims. Primary water sources are water wells, with five run by the BLM for livestock and wild horses and others pumped by permittees, which allows some rotation of grazing use based on the wells that are turned on. There are five transects in the area showing decreases in bare ground, with three established in 1980 and two in 1995. The three pace-frequency transects showed an average decrease in bare ground from 44 percent in 1980 to 23 percent in 2012, the line-point transects showed average decreases from 40 percent to 23 percent between 1995 and 2012.

The Cyclone Rim allotment consists of about 300,000 acres within the Great Divide Basin. The entire Lost Creek WHHMA and a portion of the Antelope Hills WHHMA are within the allotment. Grazing use includes spring through fall cattle grazing in the west, fall through spring cattle grazing in the east and south, and winter sheep use from winter through spring. Some sheep use also occurs in late summer through fall. Soils and vegetation vary throughout the allotment and include greasewood flats, saltbush grasslands, and Wyoming big sagebrush grasslands. Primary water sources are water wells, with isolated springs providing natural sources of water. A transect named KA-5 within the Cyclone Rim allotment has

shown a decrease in bare ground from 69 percent in 1980 to 27 percent in 2013. Other transects within the allotment have shown either steady amounts of bare ground or small improvements. A 3x3 photo-point associated with KA-3 (Cyclone Rim) shows an obvious difference between 1991 and 2008 when the last photo was taken (Standard #1 – page 1 photos). Newly established transects in the Larson Knoll and Jawbone allotments have 35 percent and 24 percent bare ground in sage-grass plant communities respectively.

Vegetative cover and litter within watersheds varies with the soils, slope, aspect, elevation and precipitation. Research conducted in Wyoming indicated that upland plant communities often can be maintained with ground cover of 30 percent, while sediment yield increased dramatically when cover declined to less than 30 percent (Linse, Smith and Trlica, 1992). This research occurred in sagebrush/grass plant communities in a 10 to 14 inch precipitation zone. The data above is often falling below 30 percent or is trending in that direction in the sagebrush/grass sites. Saltbush sites have higher levels of bare ground but are all have more than 30 percent plant cover and currently range between 40 percent to 60 percent bare ground. Since much of this watershed is within a seven inch to nine inch precipitation zone, it is likely that natural levels of bare ground would be higher than in the 10 to 14 inch precipitation zone where the research was conducted. Most channels are dry except during runoff events that last from a few minutes to a few days in the spring, and are moderately vegetated with rhizomatous wheatgrass, bluegrass, basin wildrye, big sagebrush, and other upland species.

The "Interpreting Indicators of Rangeland Health" (Technical Reference 1734-6, Version 4 – 2005) evaluates 17 indicators, with pedestalling being the principle factor rising above the "None to Slight" category, varying between "Slight to Moderate" or "Moderate". However, active pedestalling is not common and historic pedestals are rounded over and recovering. In locations with pedestals there would also have been soil loss from these sites, although most of this terrain is flat to gentle slopes so that soil movement would not occur very rapidly. Observed gullies are also generally well vegetated and recovering with no rills in the majority of the landscape (mostly along roads). Flow patterns and litter movement on steeper slopes and less vegetated sites (shale, saltbush steppe, and shallow loamy) will sometimes also be rated as "Slight to Moderate", but this is due more to topography and soils than to impacts from livestock grazing. The remainder of the 17 indicators tend to fall in the "None to Slight" rating, however, in locations where increaser species of rhizomatous wheatgrass and little bluegrass dominate with fewer large perennial bunchgrasses, the "Plant Community Composition and Distribution Relative to Infiltration and Runoff" was also given a "Slight to Moderate rating".

4) Reference Conditions

There are no documented reference conditions for this watershed, and just a few personal accounts by permittees. Please refer to the current conditions discussed in the 2003 watershed report. It stated that information from photo-points, channel cross-sections, transects, and personal observations show that the trend for watershed values is upward. At the time of this report, nearly all allotments in this watershed had implemented changes in livestock management during the previous five to 15 years. Vegetation treatments were also being implemented that were improving upland herbaceous cover and species composition, as well as livestock distribution of use. These factors had cumulatively led to more stable and improving conditions, but with expectations for further improvement.

5) Synthesis and Interpretation

The account described in the 2003 watershed report is similar to what can be observed today in terms of landscape and vegetation. The principle changes in land uses are an increase in roads, gas wells, and pipelines in the southern two-thirds of the watershed area that are slowly expanding to the north and east. In some locations within the Continental Divide Creston (CD-C) natural gas development, there is a

trend towards building larger well pads with multiple wells drilled from a single pad. On some pads, up to 16 wells are proposed from a single pad; reducing the amount of land disturbed for roads and well pads up to 75 percent (Standard #1 – page 2 photo). The highest amount of development is occurring in the checkerboard land ownership around Wamsutter, the road network has nearly doubled, but is muted by the gentle topography and increased use of culverts and wing-ditching. The Lost Creek ISR project will also result in an increased amount of disturbance of up to 345 acres in the future. There are also fewer issues with sediment and salinity as no drainage outlets exist to the Colorado River or North Platte River drainages. Erosional problems still exist with some roads, but are often associated with older roads.

The continuing problem with roads is the inability to address the accelerated soil erosion that occurs once water passes through a culvert in a road. Where culverts simply pass the water from a drainage under a road is not the issue. In many instances, roads act as dams that catch runoff water from hillsides above the road, that is separate, from or in addition to, the water from a (or multiple) small drainage(s). The water is funneled through a culvert, and then released in one location below the culvert, rather than spreading it back out to its natural state. This results in increased soil erosion in the channel downstream and desertification of upland vegetative cover located below the road that is no longer receiving the same amount of moisture as it had before the road was constructed.

Other visible changes are evident as a result of reclamation efforts. Companies have conducted studies on methods to improve reclamation success on low reclamation potential soils within the watershed (Standard #1 –page 3 photos). Gypsum has been added to the soil to reduce sodicity, and wood chips or mulch added to reduce soil crusting. Both of these have helped improve plant establishment on clay and salty sites. Soil testing of low reclamation potential sites (required by state and office policy) has increased the awareness of salvaging topsoil with better chemical characteristics. More careful salvage and handling of topsoil has led to increased reclamation success.

Livestock grazing effects within this watershed are varied due to the season and type of use that is occurring. About one quarter of the watershed is used by winter sheep or cattle grazing during the dormant season for plant growth, which promotes good plant species, vigor, and soil cover. About one-quarter of the watershed is used for spring cattle grazing, with adjustments made in duration of use to ensure maintenance of soil and adequate vegetation cover, and trend in desired species are occurring. The remaining half of the watershed is used for summer cattle grazing, with initial deferment or rotation of grazing use made using pastures or water availability. The amount of winter sheep grazing in the area has dropped along with the increase in gas field development, primarily due to the increase in halogeton (poisonous to sheep) in disturbed areas. Ten years ago this was much more of a problem; however, recent observations along roads show improved reclamation and control of weed species, such as halogeton. The fencing of well sites in some locations also reduced livestock access to halogeton until reclamation could occur and weed control achieved. Additional long-term monitoring, particularly linking reclamation and livestock grazing, would be beneficial in assessing long-term trends in watershed health in the drainage.

The continuation of existing management, which provides for shorter duration of livestock grazing, as compared to historic use and at least partial rest from grazing during the growing season, has promoted both upland and riparian watershed improvements. The long-term decrease in the amount of bare ground observed in the allotments with transects, along with lower levels of erosion condition factors (surface litter, pedestalling, and flow patterns), indicate improving watershed and soil health. Decreased levels of livestock grazing due to voluntary reductions by permittees during periods of drought have also aided in these improvements.

Vegetation treatments have been limited during the last 10 years, with only tebuthiuron applications to thin mountain big sagebrush in the checkerboard land ownership areas. The use of tebuthiuron at lower elevation mountain big sagebrush communities was based upon past prescribed burns in these locations that were slow to recover and where the annual alyssum had increased. The recent establishment of core habitat for Greater Sage-Grouse, with a threshold of 5 percent disturbance, has also promoted a shift to more chemical treatments. Vegetation management results have been much more favorable with chemical application at a thinning rate in terms of not seeing increases in alyssum and not counting the treatments as disturbance where sagebrush cover is not reduced below 15 percent. The BLM use (or support) of prescribed burns, tebuthiuron, and mechanical treatments have increased herbaceous cover and led to better distribution of livestock grazing use that has increased cover and stability in preferred livestock grazing areas and closer to water sources. Higher sagebrush cover is due to plant succession, lack of wildfire in the ecosystem, and higher use of grasses than shrubs by grazing livestock and big game. The use of treatments and implementation of grazing systems has helped to change this trend.

Wild horse numbers have been maintained at the Appropriate Management Level (AML) for the three herd areas in the Great Divide Basin since 2006. Prior to this wild horse numbers were typically above AML (see Upland Vegetation Standard 3). The fencing of riparian habitat and providing off-site water sources for wild horses have addressed the principle resource issues discussed in the 2003 assessment, except for the control of wild horse numbers at AML. In addition, the current AML and livestock stocking rates are conservative enough to minimize forage use and competition during most drought periods. However, extended drought does require changes, which occurred this past year with most operations inside and outside the WHHMAs using half or less of their livestock grazing preference. Development of additional water sources for wild horses would still be beneficial in order to spread their use out over more of the landscape within the WHHMAs.

Current populations of big game are at or below population objectives, and are having no observable impacts on soils and watershed values. Browse use levels are generally light to moderate and the sagebrush cover is being maintained, with new regeneration of shrubs, grasses and forbs seen in transects after the wet period in 2009-2011.

6) Recommendations

Due to the existing diversity and amount of vegetative cover on uplands, declining levels of bare ground, the existing condition of primarily ephemeral channels, the management responsibility by industry and agencies in designing and mitigating impacts from roads on hydrologic flow events and soil erosion, and the generally small number of management issues that need to be managed, it is determined that the Great Divide Basin watershed continues to meet Standard #1. The following recommendations would expand upon the success already achieved and help to meet desired resource conditions in the future.

Continue to manage using Best Management Practices (BMPs) for livestock grazing. This primarily relates to manipulating the season, duration, and distribution of livestock use to meet desired resource objectives for riparian/wetland habitats. Specific dates and timing of use must be determined on a case-by-case basis. Methods to achieve this include, but are not limited to, herding, fencing, water developments, and vegetation treatments.

Identify and correct problems to improved roads, which affect safety, water quality, channel stability, soil erosion, and sedimentation. Two-track roads are too numerous to deal with as a whole; however, problem areas should identified and fixed, or the roads should be closed and reclaimed. All oil and gas companies should implement stormwater control measures as well as reclamation practices on active and dry hole locations, roads, and pipelines, which would minimize the amount of bare ground exposed to wind and water erosion.

Maintain wild horse populations in the Antelope Hills, Lost Creek and Stewart Creek WHHMAs at their current AMLs of 245-339 wild horses (total for three areas) (Map #6). Ensure adequate monitoring of distribution, diet, and other important factors to determine if this AML is the appropriate level to manage for in regards to vegetation cover and soil stability, along with use by livestock and wildlife.

Implement vegetation treatments where needed to restore plant communities with diverse species, age classes, and cover types. Promote composition and/or cover of plant communities and litter that will minimize surface runoff and soil erosion while meeting other resource objectives.

Expand education about the public's role in public land management, particularly regarding impacts from roads and off-highway vehicular activities. Continue to identify and correct impacts from improved and un-improved roads, which affect water flows and/or soil erosion. Incorporate watershed and soils management needs into RFO travel management plans and recreation area management plans.

Upper and Lower Separation Creek/Boggy Meadows in the Great Divide Basin

1) Characterization

The Upper and Lower Separation Creek and Boggy Meadows watersheds are being discussed separately since there are more defined channels in Separation Creek and Lost Soldier Creek. These watersheds are similar in terms of originating in 14 to 17 inch precipitation zones and ending in 7 to 9 inch precipitation zones. Soils predominantly consist of shale and sandy clay-loam textures, with short portions of perennial and intermittent stream segments turning into ephemeral drainages that terminate in playa lakes. Topography is flat to gently rolling landscape at the lower elevations, becoming moderately-steep to steep close to rims and headwater locations, with a change in elevation of 2,400 feet in both drainages. This higher gradient creates a higher potential for head-cuts and gullies in the headwater areas that diminishes as you move downstream. The Separation Creek drainage is almost entirely within the checkerboard land ownership pattern, with about half of the area within BLM-Administered public lands. In contrast, the Boggy Meadows watershed is mostly a block public land ownership with scattered tracts of private and state land ownership. The only sites having stream flows where channel classification was determined were along Lost Soldier Creek and Separation Creek, both C6 streams in the upper sections, then becoming E6 channels at the lower ends of both channels.

Principal human uses in this watershed are oil and natural gas development, livestock grazing, and recreation. The oilfield near Bairoil was discovered in the early 1900s and natural gas development via coal-bed methane gas has recently occurred in the upper Separation Creek area over the last 10 years. There is also a very small oil development at the head of Separation Creek. Livestock use is primarily cattle, including both cow-calf and yearling operations, although mostly the former. Sheep use south of Ferris Mountain was converted to cattle to reduce the likelihood of disease transmission to bighorn sheep populations on the mountain. Recreation is largely related to hunting, primarily during the fall (September through October).

2) Issues and Key Questions

The issues and key questions discussed in 2003 are still relevant in 2013. Issues involved oil and gas development, livestock grazing, erosion, wild horses and plant cover (formerly woody plant health), please see the discussion in the 2003 watershed assessment.

3) Current Conditions

Due to the ephemeral nature of the majority of this area, no quantifiable data about stream flows is being collected, and range conditions and trend are being assessed through photo-points, upland transects, and personal observations.

The principle trend data is either from saltbush steppe or big sagebrush key areas, the two most prevalent vegetation types in the Great Divide Basin. In the Stewart Creek allotment within the watershed, soils are a mixture of clay loams supporting saltbush and greasewood communities and sandy clay loams that support Wyoming and mountain big sagebrush communities. Closer to the rims there is more rock. Four transects were re-read, two that date back to 1980 and two to 1995. Bare ground decreased from 55 percent to 36 percent between 1980 and 2012, and from 40 percent to 30 percent between 1995 and 2012, with the three locations being in clay loam soils. The remaining transect was in sandy clay loam soils and decreased in bare ground from 52 percent to 41 percent from 1995 to 2012.

In the Shamrock Hills allotment, cattle grazing is rotated between four pastures consisting of a combination of saltbush and sagebrush communities. Three transects established in saltbush communities during 1993 were re-read, with bare ground averaging 53 percent in 1993 and 45 percent in 2012.

Within the Fillmore allotment there are several transects that have been in existence since the early 1990s. Many of these transects were established to document vegetation community response after treatment. The transects within the higher precipitation areas of the Fillmore show an average of 7.5 percent bare ground and 0.9 inch perennial plant spacing (Standard #1 – page 4 photos). In the lower precipitation areas of the Fillmore, bare ground was reduced on average from 25 percent to 18 percent with perennial plant spacing improving from 1.2 inches to 0.8 inches.

Upper Separation Creek is perennial to intermittent and supports both herbaceous and woody riparian vegetation. The remainder of the channels are dry, except during runoff events that last from a few minutes to a few days in the spring, and are moderately vegetated with rhizomatous wheatgrass, bluegrass, basin wildrye, big sagebrush, and other upland species.

The “Interpreting Indicators of Rangeland Health” (Technical Reference 1734-6, Version 4 – 2005) evaluates 17 indicators, with pedestalling being the principle factor rising above the “None to Slight” category, varying between “Slight to Moderate” or “Moderate”, particularly in the moderate to steep terrain. However, active pedestalling is not common and historic pedestals are rounded over and recovering. In locations with pedestals there would also have been soil loss from these sites, although most of this terrain is flat to gentle slopes so that soil movement would not occur very rapidly. Observed gullies are also generally well vegetated and recovering with no rills in the majority of the landscape (mostly along roads). Flow patterns and litter movement on steeper slopes and less vegetated sites (shale, saltbush steppe, and shallow loamy) will sometimes be rated as “Slight to Moderate” also, but this is due more to topography and soils than to impacts from livestock grazing. The remainder of the 17 indicators tend to fall in the “None to Slight” rating, however, in locations where increaser species of rhizomatous wheatgrass and little bluegrass dominate with fewer large perennial bunchgrasses, the “Plant Community Composition and Distribution Relative to Infiltration and Runoff” was also given a “Slight to Moderate” rating.

4) Reference Conditions

There are no documented reference conditions for this watershed, and just a few personal accounts by permittees. Please refer to the current conditions discussed in the 2003 watershed report. It stated that information from photo-points, channel cross-sections, transects, and personal observations show that the trend for watershed values is upward. At the time of this report, nearly all allotments in this watershed had implemented changes in livestock management during the previous five to 15 years. Vegetation treatments were also being implemented that were improving upland herbaceous cover and species composition, as well as livestock distribution of use. These factors had cumulatively led to more stable and improving conditions, but with expectations for further improvement.

5) Synthesis and Interpretation

Livestock grazing continues to be the principle impact within the watershed, with lesser impacts from vegetation treatments, local areas of oil and gas development, wild horses, wildlife, and recreation. There has not been any extensive road expansion or other surface disturbing activities. The continuation of existing livestock management in most allotments, which provide for shorter duration of grazing (compared to historic use) and at least partial rest from grazing during the growing season, has promoted both upland and riparian watershed improvement. Lower levels of livestock grazing due to voluntary reductions by permittees during drought have also aided in this improvement. The long-term decrease in bare ground observed in all allotments with established transects, along with generally low levels of bare ground in new monitoring locations, and lower levels of erosion condition factors (surface litter, pedestalling, and flow patterns) indicate improving watershed and soil health.

Vegetation treatments have been limited during the last 10 years, with only tebuthiuron applications to mountain big sagebrush and a small prescribed burn on Atlantic Rim to enhance aspen and mountain shrub plant communities. The use of tebuthiuron is less controversial in Greater Sage-Grouse habitat, and it is easier to apply than conducting a prescribed burn, invasive species do not expand, and permittee cost-sharing in the aerial application helps to treat more acres. The BLM use (or support) of prescribed burns and Tebuthiuron have increased herbaceous cover and led to better distribution of livestock grazing use that has increased cover and stability along lower drainages and adjacent slopes. Higher sagebrush cover is due to plant succession, lack of wildfire in the ecosystem, and higher use of grasses than shrubs by grazing livestock and big game. The use of treatments and implementation of grazing systems has helped to change this trend. There are two prescribed burns planned for Upper Separation Creek to additionally enhance aspen and mountain shrub communities. However, the recently adopted Greater Sage-Grouse policy has had a dampening effect on the use of prescribed fire. Since the upper half of this watershed is within Greater Sage-Grouse core area, the policy will need to be addressed in the coming years to still allow the use of fire to improve watershed values and achieve greater herbaceous cover, reduced runoff and sediment delivery, and healthy aspen woodlands to support beaver.

Wild horse numbers have been maintained at the Appropriate Management Level (AML) for the Stewart Creek herd area since 2006. Prior to this wild horse numbers were typically above AML (see Upland Vegetation Standard 3). See synthesis and interpretation of the Great Divide Basin also in appropriate in the Boggy Meadows area.

The principle areas affected by oil and gas development are in the vicinity of Bairoil/Lamont in the Boggy Meadows watershed and the upper end of the Atlantic Rim Natural Gas project in the Upper Separation Creek watershed. Reclamation efforts have been very positive resulting in high grass cover and soil stability. Wild horse gathers have been a priority in Greater Sage-Grouse core habitat, which has resulted in more wild horse use in the Boggy Meadows watershed (and less wild horse use in the Great Divide Basin watershed). This use tends to be well distributed due to reliable water sources at four

reservoirs, one artesian and one pumped water well, and excess water from the Bairoil oil field that runs down Lost Solder Creek. Although much of this area overlaps with antelope crucial winter range, the fecal analysis collected shows very little diet overlap between wild horses and antelope. Browse use by antelope and mule deer is generally light to moderate, becoming moderate to severe between Bairoil and Separation Rim. However, trends in sagebrush cover are flat, regeneration of young sagebrush is occurring, and amounts of dead sagebrush are low. These factors are also helping to maintain shrub and herbaceous plant cover leading to maintenance or improvement in soil and watershed health.

6) Recommendations

Due to the existing diversity and amount of vegetative cover in uplands, declining levels of bare ground, the existing condition of stream channels, ephemeral draws and gullies, the success of reclamation, and the small number of management issues that need to be managed, it is determined that the Upper and Lower Separation Creeks/Boggy Meadows watersheds within the Great Divide Basin continues to meet Standard #1. The following recommendations would expand upon the success already achieved and help to meet desired resource conditions in the future.

Continue to manage using BMPs for livestock grazing. This primarily relates to manipulating the season, duration, and distribution of livestock use to meet desired resource objectives for riparian/wetland habitats. Specific dates and timing of use must be determined on a case-by-case basis. Methods to achieve this include, but are not limited to, herding, fencing, water developments, and vegetation treatments. Off-creek watering locations in pastures containing creeks should be considered to further maintain or improve streambank stability and channel narrowing.

Identify and correct problems to improved roads, which affect safety, water quality, channel stability, soil erosion, and sedimentation, particularly the county road west of Bairoil. Two-track roads are too numerous to deal with as a whole; however, problem areas should be identified and fixed or the roads should be closed and reclaimed. All oil and gas companies should implement stormwater control measures as well as reclamation practices on active and dry hole locations, roads, and pipelines, which would minimize the amount of bare ground exposed to wind and water erosion.

Maintain wild horse populations in the Stewart Creek WHMA at the current AML (Map #6). Ensure adequate monitoring of distribution, diet, and other important factors to determine if this AML is the appropriate level to manage for in regards to vegetation cover and soil stability, along with use by livestock and wildlife.

Implement vegetation treatments where needed to restore plant communities with diverse species, age classes, and cover types. Promote composition and/or cover of plant communities and litter that will minimize surface runoff and soil erosion while meeting other resource objectives.

Expand education about the public's role in public land management, particularly regarding impacts from roads and off-highway vehicular activities. Continue to identify and correct impacts from improved and un-improved roads, which affect water flows and/or soil erosion. Incorporate watershed and soils management needs into RFO travel management plans and recreation area management plans.

Sweetwater River in the North Platte River Basin

1) Characterization

The portion of the Sweetwater River basin includes the drainages that originate from the north and southwest sides of Ferris Mountain, including Arkansas, Rush, Pete, Cherry, Whiskey, and Muddy Creeks and their tributaries. Fifth order watersheds include Sweetwater River-Muddy Creek and Sweetwater

River-Horse Creek. The lower elevations are in a 10 to 14 inch precipitation zone, while Ferris Mountain may reach up to 20 inches of precipitation annually. Soils are generally sandy loams and sandy clay loams, with loamy sands to sands in the vicinity of sand dunes. Gravels are common, with rock becoming more common at higher elevations. Topography is flat to gently rolling landscape at lower elevations, becoming moderately-steep to steep close to Ferris Mountain, rims, and small rocky ranges. The elevation changes 3,800 feet between Ferris Mountain and the Sweetwater River. The majority of the watershed is in public ownership, with scattered parcels of private and state lands, primarily around old ranches and hay meadows. The majority of stream channels are B4 stream types in the higher elevations of the mountain, where gradients are steeper and channels are rock armored, becoming C6 stream types in lower elevations with lower gradients.

Principal human uses in the watershed are livestock grazing, hay production, and recreation. Livestock use is cattle, including both cow-calf and yearling operations. Hay production includes grass and alfalfa, using stream flows and runoff from Ferris Mountain. Recreation is primarily related to hunting during the fall, although there also is camping, fishing, and hiking on Ferris Mountain.

2) Issues and Key Questions

The issues and key questions discussed in 2003 are still relevant in 2013. Issues involved livestock grazing, plant cover (formerly woody plant health), and erosion, please see the discussion in Great Divide Basin watershed. For woody plant health, the key questions are: How are wildfires and prescribed burns received by the public in terms of the short-term loss of habitat and hunting sites versus the long-term benefits to wildlife, stream flows and vegetation cover?

3) Current Conditions

Due to the ephemeral nature of this drainage, no quantifiable data about stream flows is being collected, and range conditions and trend are being assessed through photo-points, upland transects, and personal observations.

The principle trend data is from the dominant sage/grass plant community, which consists primarily of needle-and-thread, upland sedges, and either black sage or Wyoming big sagebrush. The Bar Eleven allotment includes portions of the Cherry, Pete, Rush, and Arkansas Creek drainages, and consists of eight larger pastures that cattle are rotated through between June and November. Using transect information from five locations during 1993 to 2012, the bare ground decreased from 42 percent originally to 18 percent in 2002 and 14 percent in 2012. Four additional locations established during 2012 in different pastures averaged 17 percent bare ground. The grass, upland sedges, mat forbs, and sagebrush, along with a sandy/gravelly substrate, provides very stable soils with excellent infiltration and very low runoff. The Cherry Creek allotment to the west, which is also grazed with cattle, and has been historically, has four large pastures with similar vegetation and soils to the Bar Eleven allotment. Four transects in Cherry Creek established in 2008 and re-read in 2012 averaged four to five percent bare ground. The Buzzard allotment is another large allotment with 13 pastures to the east of the Bar Eleven allotment, in which 19 transects were either re-read, established or re-photographed in order to evaluate trends. The Buzzard is a 78,848 acre allotment, with topographic variation of 6,225 feet at Pathfinder Reservoir to 9,525 feet near the top of Ferris Mountain. Soils consequently vary greatly within this topographic span, ranging from true sand dunes to steep ridges and escarpments. In the more sandy loams at the lower elevations, transects averaged 10 to 12% bare ground, with the higher elevation transects – not within the Ferris wildfire burn area – averaged 15%.

The Arkansas Creek drainage was the principle area affected (within this watershed) by the 2012 Ferris Mountain wildfire. Snowpack and rainfall since the July wildfire have been at moderate levels, with a

few inches of ash and silt deposition along burned channels, such as parts of upper Arkansas Creek. Several late summer thunderstorms on part of the Arkansas Creek drainage produced rills on steep slopes and moved additional ash and fine sediment downslope and into channels, although new vegetation was able to hold most of the soils in place. Aerial plant cover is still very low in burn areas that were dominated by conifers, averaging 6 percent overall and 1 percent on three sites in the Arkansas Creek drainage. Aerial plant cover in shrubland habitats with residual grass cover averaged 19 percent, providing more site stability. Most sites on steeper slopes with a high amount of rock and gravel improved soil retention and site stability.

The "Interpreting Indicators of Rangeland Health" (Technical Reference 1734-6, Version 4 – 2005) evaluates 17 indicators, most of which compare very closely with conditions expected for these areas. The principle factor varying a little from this is pedestalling, which in some areas is rated at "Slight to Moderate" deviation from the condition expected. However, active pedestalling is not common and historic pedestals are rounded over and recovering. Gullies observed are also generally well vegetated and recovering. Flow patterns and litter movement on steeper slopes will sometimes be rated as "Slight to Moderate" also, but this is due more to topography and soils than to impacts from livestock grazing. The amounts of gravel and rock in these soils and stream channels provides a high degree of armoring and stability, which along with the vegetative plant cover, minimizes potential for erosion.

4) Reference Conditions

There are no documented reference conditions for this watershed once you get away from the Sweetwater River and the adjacent Oregon Trail, other than and just a few personal accounts by permittees. Please refer to the current conditions discussed in the 2003 watershed report. It stated that information from photo-points, channel cross-sections, transects, and personal observations show that the trend for watershed values is upward. At the time of this report, all allotments in this watershed have implemented changes in livestock management during the previous ten to twenty years. These factors had cumulatively led to more stable and improving conditions, but with expectations for further improvement.

5) Synthesis and Interpretation

Livestock grazing continues to be the dominant impact on soils and watershed health, although the 2012 wildfire had a large effect on the eastern portion of the upper Arkansas Creek drainage. Other land use factors continue to have minimal impacts within the watershed. Livestock grazing has primarily consisted of the continuation of existing management, using multiple pastures and rotated livestock use to maintain or improve watershed and soil health. The principle change in livestock grazing has been the shift to cool season grazing, primarily in the late summer and fall, of pastures with streams and riparian habitat to reduce impacts from "hot season" use. The continuation of existing management, which provide for shorter duration of livestock grazing (compared to historic use), and partial rest from grazing during the growing season, has promoted both upland and riparian watershed improvements. Development of off-channel water sources in Bar Eleven and Cherry Creek allotments have also helped to support this improvement. The long-term decrease in bare ground observed in the Bar Eleven allotment; along with low levels of erosion condition factors (surface litter, pedestalling, and flow patterns) indicates improving watershed and soil health. In many locations the amount of bare ground is low enough that they are not likely to decrease any further. Although management changes have not been in place as long in other allotments within the watershed, similar results are expected regarding plant cover and litter. The soil types, amount of rock and gravel, and existing vegetation provide for high site stability with the continuation of rotated grazing management.

Photo-points along streams show maintenance or continued improvement in channel narrowing and bank stability. The initial improvement in channel width/depth ratios happens quickly and then slows down as sedges recover and sediment sources for bank-building become more limited. In addition, high flow events (out of bank flooding) only occur periodically, which greatly affect the rate of change in channel morphology. Besides the channel shape, photos show increasing amounts of willows, sedges, and other deep-rooted vegetation that are improving bank stability. In the middle section of Pete Creek, beaver have returned to most of the stream reach and improved stability through their dams and by expanding the width of the riparian area, so that high flow events are spread out over a wider area which helps to dissipate the high energy in them (Standard #1 – Page 5 photos). It is likely to take 30 to 50 years to restore a permanent beaver population supported by a diverse, mixed-age plant community. Therefore, continuation of good livestock management, whether it is the existing management or an improvement upon it, needs to be a long-term commitment between the BLM, permittees, conservation districts, and other partners.

Vegetation treatments have been discussed for Ferris Mountain for many years. Small cuttings of conifer encroachment into aspen and riparian health had been completed along Cherry and Whiskey Creeks under the Forest Health policy. In 2011, an environmental assessment was completed for prescribed burns and managed natural ignitions to address the loss of aspen, and disease and decadence in the conifer community. The 10,000 acres burned, by natural ignition, in 2011 and 2012 will be a great opportunity to learn from and modify future burns on the mountain to minimize negative impacts and enhance the long-term benefits to watershed values. Future vegetation treatments on the south side of Ferris Mountain will be limited by BLM policy for Greater Sage-Grouse. Since the boundary line of core habitat for Greater Sage-Grouse is based on a distance of 5.8 miles from an active lek, part of the steep slopes of Ferris Mountain are considered core habitat even though Greater Sage-Grouse use on these steep slopes and in timber rarely occurs. In other areas, the BLM use (or support) of prescribed burns, tebuthiuron, and mechanical treatments have resulted in increased herbaceous cover and led to better distribution of livestock grazing that have increased the amount of cover and stability along streambanks and lower adjacent slopes. Higher sagebrush cover and conifer encroachment into shrub communities is due to plant succession, lack of wildfire, and increased foraging of grasses than shrubs by grazing livestock and big game. The use of treatments and implementation of grazing systems has helped to change this trend. However, the recently adopted Greater Sage-Grouse policy, which treats habitat enhancement projects the same as disturbance or loss of habitat from development, is limiting the use of and increasing the cost of prescribed fire. In the future, the Greater Sage-Grouse policy will need to be addressed to permit the use of fire to improve watershed values and achieve greater herbaceous cover, reduced runoff and sediment delivery, and healthy aspen woodlands to support beaver.

Erosional problems due to two-track roads still exist in locations on steeper slopes where water-bars are needed. These are generally short stretches of road where two to four water-bars would keep water from flowing down the road, increasing the depth of ruts, until a new track is made to the side of the old road location.

6) Recommendations

The account described in the 2003 watershed report is similar to what could be observed today in terms of landscape and vegetation. The principle changes are the removal of vegetation cover as a result of wildfire and a managed natural ignition on Ferris Mountain. Due to the existing diversity and amount of vegetative cover on uplands, declining levels of bare ground, stable channels and improving trends in stream vegetation, the livestock management that provides for plant growth to maintain cover and vigor, the rest from grazing for most of the Ferris Mountain wildfire area (and late season deferment on the rest of it) to promote plant recovery, and the generally small number of management issues that

need to be managed, it is determined that the Sweetwater River watershed within the report area is meeting Standard #1. The following recommendations would expand upon the success already achieved and help to meet desired resource conditions in the future.

Continue to manage using BMPs for livestock grazing. This primarily relates to manipulating the season, duration, and distribution of livestock use to meet desired resource objectives for both riparian and upland habitats. Specific dates and timing of use must be determined on a case-by-case basis. Methods to achieve this include, but are not limited to, herding, fencing, water developments, and vegetation treatments. Off-creek watering locations in pastures containing creeks, particularly in the Ferris Mountain area, should be developed to further maintain or improve streambank stability and channel narrowing. Additional crossing points on streams may need to be considered where width/depth rations make it difficult for animals to get across anymore.

Two-track roads are too numerous to deal with as a whole; however, areas that affect water flows and contribute to soil erosion should identified and addressed or the road should be closed and reclaimed.

Implement vegetation treatments and/or manage natural ignitions (wildfires) where needed to restore plant communities with diverse species, age classes, and cover types. Promote composition and/or cover of plant communities and litter that will minimize surface runoff and soil erosion while meeting other resource objectives.

Expand education about the public's role in public land management, particularly regarding impacts from roads and off-highway vehicular activities. Incorporate watershed and soils management needs into RFO travel management plans and recreation area management plans.

North Platte River Basin other than Sweetwater River

1) Characterization

The portion of the North Platte River basin within this report is the west side of Pathfinder and Seminoe Reservoirs, which include Sand, Deweese, Sunday Morning, Junk, Wood, Long, Tincup, Indian, Rankin, Hurt, Bothwell, and Douglas Creeks. The fifth order watersheds are known as Pathfinder Reservoir and Seminoe Reservoir. The lower elevations are in a 10 to 14 inch precipitation zone while the Seminoe Mountains may reach 16 to 20 inches of precipitation annually. Soils are generally sands to sandy clay loams at lower elevations, and clay-loams where there is saltbush. Higher elevations have more clay loam to loamy soils with increasing amounts of gravels and rock. Topography is flat to gently rolling landscape at lower elevations, becoming moderately-steep to steep close to Ferris Mountain, rims, and small rocky ranges. Total elevation change is 2,500 feet between Seminoe Mountain and Pathfinder Reservoir. The majority of this watershed is in public ownership, with scattered parcels of private and state lands, primarily around old ranches and hay meadows, with a checkerboard land ownership adjacent to the upper end of Seminoe Reservoir. The majority of stream channels are B4 stream types higher on the mountain where gradients are steeper and channels are rock armored, becoming C6 stream types in lower elevations with lower gradients.

Principal human uses in this watershed are livestock grazing, hay production, and recreation. A small coal-bed methane gas field was developed on the west side of Seminoe Reservoir but is now inactive. Livestock use is cattle, including both cow-calf and yearling operations. Hay production includes grass and alfalfa, using stream flows and runoff from Ferris and Seminoe Mountains. Recreation is primarily related to hunting during the fall, and summer fishing and boating use of Pathfinder and Seminoe Reservoirs. The Seminoe-Alcova Scenic Biway crosses the watershed.

2) Issues and Key Questions

The issues and key questions discussed in 2003 are still relevant in 2013. Issues involved livestock grazing, plant cover (formerly woody plant health), erosion, and oil and gas development, please see the discussion in Great Divide Basin watershed. For woody plant health, the key questions are: How are wildfires and prescribed burns received by the public in terms of the short-term loss of habitat and hunting sites versus the long-term benefits to stream flows and vegetation cover and thereby wildlife?

3) Current Conditions

Due to the small size of most of the creeks, along with intermittent nature and irrigation diversions, no quantifiable data about stream flows is being collected. Range condition and trend are being assessed through photo-points, upland transects, and personal observations.

The principle trend data is from the dominant sage/grass plant community, which consists primarily of needle-and-thread, upland sedges, and either black sage or Wyoming big sagebrush. The Seminoe allotment includes portions of the Deweese, Sunday Morning, Rankin, Indian, Hurt, and Bothwell drainages, and includes 28 pastures that cattle are rotated through between March – February (yearlong). Using transect information from seven locations in 1977 to 2013, the bare ground decreased from 40 percent originally to 17 percent in 2013. The principle change in management has been the rotation of cattle use and more attention to the duration and season of use, as well as upland water development. The mix of sagebrush, grass, and forbs on most of the landscape provides for very stable soils with excellent infiltration and very low runoff. There are large areas with stabilized sand dunes, as well as active sand dunes. These dunes are being stabilized with blowout grass, prairie sandreed, sand dropseed, Indian ricegras,s and needle-and-thread, along with silver sagebrush, scurfpea, and other plant species. The Buzzard allotment is another large allotment with 13 pastures to the north of the Seminoe allotment, and is used with other allotments by Pathfinder Ranch. A total of 29 trend transects were conducted on the Buzzard, Buzzard Ranch Meadow, Sand Creek, Sand Creek Ranch Pasture, and Junk Creek Allotments. Sample Point, Paced Frequency, 3x3 photo point, browse and Wyoming State Sage-Grouse Habitat Protocol assessments were either re-read or established. Bare ground averaged 10% in the lower and sandy elevations and, outside of the Ferris wildfire burn area- bare ground averaged 15%.

The Sand Creek drainage was the principle area affected (within this watershed) by the 2012 Ferris Mountain wildfire (Standard #1 – Page 6 photos). Areas burned down to mineral soil with nearly complete consumption of all litter, duff, branches and limbs less than four inches in diameter. Fortunately, snowpack and rainfall occurred in light to moderate intensity with slow to little runoff, resulting in high infiltration rates and low erosion and ash and silt deposition of a few inches along channels which burned. Much of the Sand Creek drainage (wet areas) did not burn and mature vegetation along the channel filtered what sediment washed into it. High intensity thunderstorms that affected the adjacent Arkansas Creek drainage did not appear to have the same effect in the Sand Creek drainage. Aerial plant cover is still very low in burn areas that were dominated by conifers, as well as black sagebrush sites, compared to deeper soils supporting mountain big sagebrush and other shrubs and herbaceous species which had aerial cover averaging 19 percent. There is a lot of rock and pebbles in most of these soils that also help improve soil retention and site stability.

The “Interpreting Indicators of Rangeland Health” (Technical Reference 1734-6, Version 4 – 2005) evaluates 17 indicators, against which conditions are to be compared. Most of the North Platte River Basin compares very closely with conditions expected for these areas. The principle factor varying a little from “expected” is pedestalling, which in some areas rated at “Slight to Moderate” deviation. However, active pedestalling is not common and historic pedestals are rounded over and recovering.

Gullies observed are also generally well vegetated and recovering. Flow patterns and litter movement on steeper slopes will sometimes also be rated as "Slight to Moderate", but this is due more to topography and soils than to impacts from livestock grazing. The amounts of gravel and rock in these soils and stream channels provides a high degree of armoring and stability, which along with the vegetative plant cover, minimizes potential for erosion.

4) Reference Conditions

There are no documented reference conditions for this watershed, and just a few personal accounts by permittees. Please refer to the current conditions discussed in the 2003 watershed report. It stated that information from photo-points, channel cross-sections, transects, and personal observations show that the trend for watershed values is upward. At the time of this report, nearly all allotments in this watershed had implemented changes in livestock management during the previous five to 15 years. Vegetation treatments were also being implemented that were improving upland herbaceous cover and species composition, as well as livestock distribution of use. These factors had cumulatively led to more stable and improving conditions, but with expectations for further improvement.

5) Synthesis and Interpretation

Livestock grazing continues to be the dominant impact within the watershed, with small local effects from oil and gas development, recreation and wildlife. Livestock grazing has primarily consisted of continuation of existing management, use of multiple pastures, and rotated livestock use to maintain or improve watershed and soil health. The continuation of existing management, which provides for shorter duration of livestock grazing (compared to historic use) and partial rest from grazing during the growing season, has promoted upland and riparian watershed improvement. Development of off-channel water sources in the Buzzard and Seminoe allotments have also helped to support this improvement.

Photo-points along some of the streams show maintenance or improvement in channel narrowing and bank stability. The late season deferment of upper Sand Creek has shown vast improvement in bank stability, primarily with sedges and grasses, but with very little expansion of waterbirch (which is common) and willows (which are not common). Plantings of these species and other shrubs may help improve channel stability. Shortened duration of use and reduced hot season grazing has also helped improve channels within the Seminoe allotment. Recent ownership changes on several of the allotments in this watershed also offer the opportunity to implement changes in management.

Vegetation treatments have been limited until the last three years, with only one prescribed burn of 455 acres prior to 2011. The prescribed burns and wildfires on Ferris and Seminoe Mountains in the last three years have resulted in over 19,500 acres burned. The BLM use (or support) of prescribed burns, managed natural ignitions, and mechanical treatments will (as they recover) shift vegetation cover to more herbaceous, shrubland, and aspen woodland species, instead of the current dominance by conifers. The large number of dead, decadent, and diseased trees on Ferris Mountain in particular, and the conifer encroachment into shrubland and aspen woodland on both mountains, require the use of fire to restore health and diversity in these communities. As the vegetation recovers there will be opportunities to support beaver reintroduction that will add to the long-term stability and function of aspen woodland and riparian habitat. In some locations and on lower slope, fires will lead to better distribution of livestock grazing use that will maintain or improve plant cover and soil stability as compared to current conditions. The use of off-channel water development has increased in the last 10 years, and should be encouraged in areas more sensitive to channel damage from cattle, such as Sand Creek and any streams that support fisheries. The implementation of grazing systems and use of vegetation treatments have, or are currently leading to, improved soils and watershed health. However, the recent burns on Ferris Mountain have not been fully supported by the WGFD where they occurred

within Greater Sage-Grouse core habitat. There must be a more common sense approach implementing the Greater Sage-Grouse policy, so that unsuitable habitat within core area can be treated to improve poor condition, late seral vegetation that will improve land health and benefit other species of wildlife.

Erosional problems due to two-track roads still exist in locations on steeper slopes where water-bars are needed. These are generally short stretches of road where two to four water-bars would keep water from flowing down the road, increasing the depth of ruts, until a new track is made to the side of the old road location. Within this watershed there are more intermingled private and state lands, so that improving roads will need to occur via a coordinated and cooperative approach to be successful.

6) Recommendations

Due to the existing diversity and amount of vegetative cover in uplands, declining levels of bare ground, the existing condition of primarily ephemeral channels, the management responsibility by industry and agencies to design and mitigate impacts from roads on hydrologic flow events and soil erosion, and the generally small number of management issues that need to be managed, it is determined that the North Platte River watershed within this report continues to meet Standard #1. The following recommendations would expand upon the success already achieved and help to meet desired resource conditions in the future.

Continue to manage using BMPs for livestock grazing. This primarily relates to manipulating the season, duration, and distribution of livestock use to meet desired resource objectives for riparian/wetland habitats. Specific dates and timing of use must be determined on a case-by-case basis. Methods to achieve this include, but are not limited to, herding, fencing, water developments, and vegetation treatments. Off-creek watering locations in pastures containing creeks, particularly in the Ferris Mountain area, should be developed to further maintain or improve streambank stability and channel narrowing. Additional crossing points on streams may need to be considered where width/depth rations make it difficult for animals to get across anymore.

Identify and correct problems to improved roads, which affect safety, water quality, channel stability, soil erosion, and sedimentation. Two-track roads are too numerous to deal with as a whole, however, problem areas should be identified and fixed or the roads should be closed and reclaimed.

Implement vegetation treatments where needed to restore plant communities with diverse species, age classes, and cover types. Promote composition and/or cover of plant communities and litter that will minimize surface runoff and soil erosion while meeting other resource objectives.

Expand education about the public's role in public land management, particularly regarding impacts from roads and off-highway vehicular activities. Continue to identify and correct impacts from improved and un-improved roads, which affect water flows and/or soil erosion. Incorporate watershed and soils management needs into RFO travel management plans and recreation area management plans.

STANDARD 2 – RIPARIAN/WETLANDS

Riparian and wetland vegetation have structural, age, and species diversity characteristic of the state of channel success and is resilient and capable of recovering from natural and human disturbance in order to provide forage and cover, capture sediment, dissipate energy, and provide for ground water recharge:

1) Characterization

Riparian/wetland habitat consist of a variety of plant communities, including riparian grassland, willow-waterbirch riparian shrublands, and cottonwood and aspen riparian shrublands. Riparian grassland is the most common type community and, along with the willow-waterbirch riparian shrubland, comprise most of the riparian/wetland habitat in the Great Divide Basin/Ferris and Seminoe Mountain Watersheds. These habitat types are critical in supplying water, forage, and habitat for wildlife and fisheries, livestock grazing, wild horses, irrigation, and use by recreationists. Riparian/wetland habitats make up less than one-half percent of the landscape, and approximately 20 percent are located on public lands administered by the BLM. As a result, the RFO works with its partners on a landscape basis to improve this habitat, as it benefits both public and private interests and values.

The primary method used to evaluate this standard is a qualitative assessment procedure called Proper Functioning Condition (PFC). The process evaluates physical functioning of riparian/wetland areas through consideration of hydrology, vegetation, and soil/landform attributes. PFC assessments are used along with other existing information such as photo-points, stream cross-sections, grazing use, other relevant history, and other habitat or population assessments to evaluate this standard of rangeland health. It is important to note that the PFC assessment provides information on whether an area is physically functioning in a manner that allows maintenance or recovery of potential values (e.g. fish habitat, vertical structure for song birds, or specific species for forage) over time. However, PFC is not desired or future condition (TR 1737-15, 1998). Another method used in this area include the Habitat Quality Index (HQI; Bins 1979).

It is important to realize that livestock management of riparian/wetland habitat has only developed since the mid-1980s. Rangeland management evolved during the early to mid- 1900's with a focus on uplands, primarily looking at stocking rates, range readiness, and proper utilizations rates on upland species. Allotment Management Plans (AMPs) implemented by the BLM prior to 1980 did not recognize or discuss riparian values or management. Although this has changed, restoring the species and structural diversity within these communities will take considerable time.

2) Issues and Key Questions

The issues and key questions from the 2003 document are still valid at this time. This included animal use by livestock, wild horses, and wildlife, hummocks, natural succession, vegetation plantings, vertical instability, roads, and effects from coalbed methane development. Livestock management is still the most dominant influence upon riparian/wetland habitat. The following text is in addition to the earlier discussion.

The hydrologic drought conditions that began in this region in the late 1980s are still continuing, despite some very good precipitation years. Evidence of this includes areas, such as the Mahoney Lakes, that have been dry since 1990, seeps in the lower Stewart Creek exclosure and the upper end of the upper Stewart Creek riparian pasture continue to produce less water and are being encroached with big sagebrush, and the dune ponds south of the Ferris Mountains continue to shrink in size or have become completely vegetated trending towards drier adapted riparian species. How can we as land managers, permittees, and other cooperators adapt to these changes and are there ways to mitigate these impacts?

The value of riparian/wetland habitat to grazing permittees and landowners is still not as well understood as it should be. How can this information be made better quantifiable or disseminated to help these people make more informed grazing management decisions?

Development of spring/seep exclosures, designated riparian pastures, and deferment of livestock grazing on riparian habitat have promoted the recovery of sedges and other deep-rooted species that are important in stabilizing streambanks. However, domination of these species may crowd out desirable forbs (e.g. clovers), and in the case of exclosures, will reduce species diversity, forage production, and increase composition of Canada thistle by the lack of removal of vegetation through grazing. How can the adverse effects of protecting these important habitats be quantified and suitable, limited grazing be implemented in such a way as to maintain desirable species and prevent expansion of Canada thistle?

In the West, hummocks have for a long-time been associated with excessive livestock grazing in riparian/wetland habitat. However, additional research has shown that the creation of hummocks is extremely complicated and not specifically tied to livestock grazing and/or trampling. Hummocked areas tend to be associated with fine soils and adequate moisture and are found all over the world's colder climates. In fact, hummocks commonly occur where large ungulates are absent. Recent research by Colorado State University on several Colorado hummock sites has only raised more questions about how hummocks are formed. (*Characteristics of hummocks and humocked wetlands in Colorado* by Smith, Mae, M.S., Colorado State University, 2011 128 pages, 1492434)

In the portion of Pete Creek just above the Bar Eleven ranch, beaver have expanded across most of the three mile reach, and through their activities have increased water storage, extended wetted habitat and willows, and are influencing riparian/wetland habitat as they once did, prior to fur trapping in the early to mid-1800s. However, this stream reach is about the only one that currently supports beaver, and the few that exist often move down into irrigated hay meadows where they have to be removed. Historic suppression of wildfires and the conversion of willow/waterbirch/aspen habitat to conifer dominated habitat is also part of the problem. The recent wildfires on Ferris Mountain have resulted in aspen regeneration that in time may support beaver populations. How can the process of expanding beaver populations be enhanced or more widely distributed across streams in the Ferris and Seminoe Mountains?

3) Current Conditions

Lotic areas not meeting PFC that are livestock related:

Buzzard allotment

The majority of the Sand Creek drainage and portions of the Arkansas Creek drainage were either burned or affected by the 2012 Ferris Mountain wildfire. The PFC team assessment scheduled in 2012 was delayed until 2013. Fire related removal of riparian shrubs, condition and trend were still difficult to evaluate. Most PFC assessments ratings were recorded as no apparent trend. Riparian habitat in the Ferris Mountain area is being influenced by livestock grazing, big game, encroachment of conifers, and loss of aspen and other shrubs, as well as gradient adjustments around residual beaver dams (beaver have been absent from this area since the 1970s). However, implementation of deferred grazing in the Ferris Mountain pasture since 2003 has resulted in reduced stream width, raised banks, and improved herbaceous species composition (Standard #2 – Page 1 photos). The Sand Creek pipeline on the south side of the Ferris Mountains that was recently completed should also help improve riparian habitat conditions by providing three upland water sources. Although there has been considerable improvement, stream width still needs to be reduced and shrub cover for bank stability and stream shading improved. Portions of Sand Creek flow through stabilized sand dunes, which are very susceptible to bank shear from cattle use and big game trailing. This could be improved through less "hot season" grazing use, as well as development of more water sources to reduce the reliance of cattle watering from streams. Continued deferment from cattle grazing and plantings of willows or other species could enhance the riparian shrub plant community. In 1995, one and a half miles of the Sand

Creek drainage, including the Miners and Turkey Creeks, on BLM lands did not meet PFC, rating functioning at risk (FAR)- trend downward. Evaluation of the same drainages the first summer following the burn, resulted in ratings of FAR-trend not apparent or PFC trend not apparent. The Arkansas Creek drainage, on the north side of Ferris Mountains, is also used by cattle later in the summer. Multiple small creeks in the drainage are armored with rock, and also heavily influenced by the encroachment of conifer, primarily subalpine fir and limber pine, the latter of which is being killed by the mountain pine beetle and white pine blister rust. Current grazing management is providing for improved riparian habitat conditions. Deweese Creek is influenced by irrigation de-watering in the adjacent upstream allotment, with a Functioning At Risk condition with no apparaent trend due to the irrigation de-watering and not livestock management for the 1.6 miles of the stream reach in the Buzzard allotment.

Cherry Creek allotment

Riparian conditions along Cherry Creek have improved with changes in grazing management to shorter duration use (four to six weeks) and rotation of use to more early or late season grazing (Standard #2 – Page 2 photos). Development of upland pipelines is almost complete and is resulting in less dependence by cattle upon watering at streams. The cutting of conifers along upper Cherry Creek has also made watering at the creek more difficult due to navigating over and/or around downed trees. Although a prescribed burn is still planned for this area to remove fine and moderate sized fuels, there is already good regeneration by aspen and understory shrubs, such as gooseberry and raspberry. In the lower elevations the waterbirch and cottonwood have expanded with good regeneration of young cottonwood. Willow are present but not as dominant as the waterbirch. The stream reach is now considered to be meeting PFC and would be a good candidate for re-introduction of beaver. Higher on the mountain the stream is still heavily encroached by conifer and would hopefully be addressed with a future prescribed burn. The portion of streams in the Cherry Creek allotment that are not meeting PFC are along two reaches of Whiskey Creek on the west end of Ferris Mountain totaling one-quarter of a mile. These reaches are in between parcels of state lands and receive too long a duration of “hot season” cattle grazing, which results in bank shear and increased stream channel width in the more open areas accessible to cattle (Standard #2 – Page 3 photo). Upper Whiskey Creek is the result of headwaters from several springs that were heavily encroached with conifers, as well as along the stream channel. These trees were removed or girdled and left as snags for wildlife that should improve cover of aspen, waterbirch and willow. This stream reach is part of a large mountain pasture. The permittee and the BLM are discussing locations where minimal fencing can be used to split the area into three pastures to reduce the duration of grazing use across the entire pasture and to meet PFC along Whiskey Creek.

Ferris Mountain allotment

Riparian conditions within the Ferris Mountain allotment have continued to improve under current livestock management. The 2012-2013 riparian assessments identified two small riparian areas still failing to meet the minimal standards for riparian health. One location consists of a small “no name seep” location that presently has large hummocks resulting from hoof impacts of wildlife and livestock (Standard #2 – page 3 photo). The other failing site is a narrow “no name” draw in the southwest portion of the Mountain Pasture. Its failure to meet the minimal standards for riparian health is attributed to existing/historical head-cuts moving through the system, and the climatic drying of the reach. While cattle trailing have resulted in some impacts (i.e. hoof action) to the reach, failure to meet the riparian standard has been attributed to the previous listed factors. Since the 2003 report, a number of management actions have been implemented and/or proposed within the Ferris Mountain allotment. Management actions include: construction of the Birch Creek pasture fence, completion of the Environmental Assessment (EA) allowing prescribed fire within and around the Ferris Mountains, continued livestock management (i.e. rest and/or deferred rotation patterns), the 2011 Ferris Mountain

managed wildfire, and the proposed mechanical thinning of sagebrush. Established monitoring continues to document changes and improving riparian health trends within existing riparian areas.

Seminoe allotment

Riparian health and trend have improved since the last watershed assessment over the whole of the Seminoe allotment. During this time an allotment Allotment Management Plan (AMP) was updated and signed, and a number of identified spring and seep sites, failing to meet the minimum standards for riparian health, were mitigated during the course of the last 10 years. The following sites have been fenced and protected, and/or off-site livestock water provided to improve riparian health: GP-16 (state land solar well), Field House Cut (Rankin Creek Spring protection and solar pump out), Rankin Creek Development (fence and off-site livestock watering), Cheyenne Ridge Spring (fence and off-site livestock watering), Wild Horse Draw Spring (fence and off-site livestock watering), Found Spring (existing fence with new off-site livestock watering) (Standard #2 – Page 4 photo), and Riddle Creek Spring (deeded land fenced with off-site livestock watering. The livestock operator, with the assistance of the SERCD and the Natural Resource Conservation Service (NRCS) also designed and installed a new livestock watering pipeline system within the GP-16, 7-Pines, Atlantic, and Indian Creek pastures. The permittee also developed a livestock watering well, on deeded land, within the H.O. pasture. As a result of the new riparian protections and developments, the majority of previously failed riparian sites were reevaluated as currently PFC or FAR with an upward trend. The single remaining riparian area within the Seminoe allotment still failing to meet the minimal standards for riparian health is a small reach of Hurt Creek within the Shipping pasture. This portion of Hurt Creek, while grazed under a deferred rotation plan, is extremely down cut with undercut banks as a result of historic irrigation practices up stream (i.e. blown out beaver dams and/or reservoirs). The identified reach also lacks many of the woody species, which are presently found downstream on Hurt Creek within the I.D. pasture. Management suggests fencing the failing portion of Hurt Creek from livestock impacts and planting native riparian vegetation (i.e. willow) to mitigate identified riparian health issues.

In addition to PFC, photo-points, and channel cross-sections, the following monitoring is also being used in this watershed assessment.

The WGFD had established permanent Habitat Quality Index (HQI) monitoring sites in three locations along Pete Creek above the Bar Eleven Ranch in 1989; however, the lowest site has not been repeated due to the presence and influence of beaver. The upper two sites have been re-evaluated several times with the latest in 2013. This data will be added into the allotment evaluation when it is received from the WGFD; however, their personal observations were that vast improvements had occurred since the study was initiated.

4) Reference Conditions

In addition to information in the 2003 watershed assessment, the following areas previously failed PFC and are now meeting PFC, with allotments listed that were livestock related and locations listed that were due to wild horses.

Cyclone Rim allotment

The Cyclone Rim allotment is located 35 miles northwest of Rawlins in the Great Divide Basin. Kinch-McKinney Spring and Olson and Olson Reservoir in the northwest corner of this allotment were non-functional, or FAR, with downward trend due to livestock grazing and wild horses. These sites were fenced with off-site water development and are now meeting PFC. Seeps in Battle Springs Flat are very small in size and more like soapholes than seeps (Standard 2 – Page 4 photo). These are not being impacted by current livestock management practices.

Jawbone allotment

The Jawbone allotment is located 20 miles northwest of Rawlins in the Great Divide Basin. Mud Springs was non-functional due to livestock grazing. This site was fenced with help from the local Rocky Mountain Elk Foundation committee and the Three-Shot Grouse Foundation, along with the development of off-site water, and is now meeting PFC (Standard 2 – Page 5 photos).

Long Creek allotment

The Long Creek allotment is located 29 miles north of Rawlins and west of the North Platte River (Kortes Dam and Miracle Mile areas). The allotment includes portions of Long Creek, Little Long Creek, Sunday Morning Creek, Tin Cup Creek, Steep Creek, Meadow Creek, and the North Platte River. The 2003 report documented portions of Sunday Morning Creek, Tin Cup Creek, Little Long Creek, Long Creek, Steep Creek, and Meadow Creek as failing the riparian standard. The 2012 re-assessment documented all failing reaches as currently PFC, with the exception of Upper Sunday Morning Creek - rated FAR with an "upward trend" and the east tributary of Sunday Morning Creek - rated FAR with "no apparent trend'. The allotment has been under new management since 2012, and the trend ratings are expected to improve as additional livestock grazing management is applied and rangeland improvement projects are constructed (i.e. pasture fencing and the development of offsite livestock watering).

Stewart Creek allotment

The Stewart Creek allotment is located 25 miles north of Rawlins in the Great Divide Basin. Lower Stewart Creek was rated FAR in static trend due to livestock grazing and wild horses. This site was fenced along with adjacent private and states lands with help from the Sun Family, and is now meeting PFC (Standard #2 – Page 6 photos) in terms of impacts from livestock and wild horses. However, the site is getting drier with encroachment of big sagebrush at the lower end. It is adjacent to an active Greater Sage-Grouse lek on the Northeast side and receives use by Greater Sage-Grouse, which may benefit if reliable water could be developed and the seeps and meadow habitat maintained.

Wood Creek allotment

The Wood Creek allotment is located 33 miles north of Rawlins and west of the North Platte River (Pathfinder Reservoirs, BOR - Miracle Mile Recreation area). The allotment includes portions of Junk Creek, Wood Creek, and Sunday Morning Creek. The 2003 S&G report documented portions of Wood Creek and Sunday Morning Creek as failing the minimum standards for riparian health. The 2012 re-assessments of the allotment documented the previously failing reaches of Sunday Morning Creek as FAR (upstream reach of the creek) with "no apparent trend" and as Non-functional (downstream reach of the creek). The non-functional reach of Sunday Morning Creek is down cut and the reach is under major adjustment resulting from a blown-out irrigation diversion, and the current re-routing of active channel flows. The FAR reach of Sunday Morning Creek is a result of diverted waters to irrigation use upstream, and the encroachment of non-riparian species into the once riparian and riparian floodplain area. The 2003 assessed section of Wood Creek that was rated as failing has been upgraded to PFC.

5) Synthesis and Interpretation

Livestock grazing continues to be the primary influence upon this watershed and the riparian/wetland habitat within its borders. Management changes initiated in the 1990's and 2000's continue to be monitored with adjustments made in livestock grazing as needed. In some areas, it is now more a matter of time, particularly in shrub and woodland types, for a more diverse age-class and vertical structure to develop. In areas close to or within the Ferris and Seminoe Mountains, monitoring and managing areas recently burned to ensure aspen and other shrub species can re-establish and/or

expand into former habitat, or implementing cutting and burning activities to restore riparian habitat heavily encroached with conifers. In some areas vegetative plantings may also help promote the process of riparian habitat recovery, particularly willows, which in some locations are not as prevalent as waterbirch. In addition, plantings improve composition and structural diversity with desirable species, such as dogwood, currant and honeysuckle.

Although the trends described above are very encouraging, the ability to restore beaver as a major component of this ecosystem is still needed. Beaver are present only in the middle reach of Pete Creek and a few in upper Muddy Creek, and could be re-introduced into Cherry Creek and Long Creek. Improved willow and waterbirch stands do help support beaver; however, long-term dam stability requires larger tree,s such as aspen and cottonwood, which are slower to return to dominance in riparian habitats. The recent wildfires are promoting aspen regeneration, which may help in future years, and may be further enhanced with additional burning or wildfires on other portions of Ferris Mountain.

Herbaceous riparian vegetation continues to change towards more mid-to-late seral composition, dominated by Nebraska and beaked sedge, along with tufted hairgrass, streambank wheatgrass, mannagrass, licorice root, and other grasses, rushes and forbs. In areas with beaver dams and more standing water there is reed canarygrass, American mannagrass, and American bulrush. Photos demonstrate the increased wetted area and riparian/wetland habitat along Pete Creek after 25 years of improved management (Standard #2 – Page 7 photos). Common reed is present along Sand Creek above the Buzzard Ranch and is an excellent stabilizing species. With current management towards short duration and “cool season” grazing use there has also been an expansion of little bluestem, a warm season grass more common in the Great Plains. Silverberry and dogwood are increasing as well along the streams on the north side of Ferris Mountain. Grazing resistant species like Kentucky bluegrass, redtop, mat muhly, false locoweed, and red clover have been reduced in composition and occur on the floodplain and along the drier edges of riparian habitat (rather than along the streambanks).

Associated with livestock management (and wild horses in the Antelope Hills/Lost Creek/Stewart Creek WHMA’s) has been the protection of springs and seeps by fencing and often the development of off-site water sources to reduce trampling, soil compaction, and potentially reduced water flows. In the drier portions of the watershed these water sources and associated riparian habitat are few in number and small in size, making them extremely important to wildlife and vulnerable to impacts from large ungulates. Although several of these projects have been completed, there are still a few that would be implemented in the future. Additional water development in the Antelope Hills/Lost Creek/Stewart Creek WHMA’s would reduce grazing pressure by wild horses around these traditional watering sites. There may also be off-site water developed from creeks to further reduce livestock impacts by providing water for drinking away from higher priority riparian habitat (ie.- fisheries/recreation).

During the 2002-2012 assessment timeframe, there have been 45,227 acres treated within the watershed, including prescribed burns and wildfires, chemical applications of tebuthiuron, and mechanical treatments. These treatments occur in mountain big sagebrush, mountain shrub, aspen woodlands, and conifer encroached shrublands and riparian habitat, so they primarily affect upland plant health (versus riparian). However, the wildfires on Ferris Mountain should definitely increase stream flows and improve aspen and riparian habitat in the short-term, and support beaver activity in the future that would improve the acreage and health of riparian/wetland habitat. The delineation of core habitat for Greater Sage-Grouse in 2008 was not regarded as having a high impact on prescribed burning; however, implementation of the policy at the state level is resulting in a dampening effect on any treatments. If similar implementation restrictions continue in the future, potential benefits to

riparian habitat would not occur (including restoring riparian and upland aspen stands to support beaver) and benefits from past treatments will shrink as natural plant succession occurs.

6) Recommendations

There have been continued improvements in riparian/wetland conditions within the assessment area over the last 20 years, considering that management of riparian habitat only started about 25 years ago. Photos illustrate change from mostly bare banks or sloughing banks dominated by Kentucky bluegrass to well vegetated banks dominated by sedges and grasses with willow recovery in many areas. Although PFC may have been reached in most areas, there will likely continue to be improvements in channel width, bank stability, and desired species, such as willows and sedges. However, there are still some specific areas that need improvement and others that will take more time to reach a desired future condition. Five allotments previously failing this Standard are not meeting it, and three other allotments listed below have improved with just very short stream reaches or seeps left to still meet PFC. Allotments containing riparian/wetland habitat that do not meet this standard have been described previously and include: Buzzard (2 miles), Cherry Creek (1/4 mile), Ferris Mountain (.10 mile), and Seminoe (1/4 miles). The seeps within Battle Springs Flats warrant continued monitoring for both wild horse and livestock use and impact. Specific recommendations include the following:

Continue to manage using BMPs for livestock grazing. This primarily relates to manipulating the season, duration, and distribution of livestock use to meet desired resource objectives for riparian/wetland habitats. Specific dates and timing of use must be determined on a case-by-case basis. Methods to achieve this include, but are not limited to, herding, fencing, water developments, and vegetation treatments. Off-creek watering locations in pastures where the creek is the principal water source should be developed to further maintain or improve streambank stability and channel narrowing.

Continue to remove conifer encroachment from riparian/wetland habitat through cuttings and/or prescribed burns and managed wildfires. Aspen habitat should also be enhanced with similar practices. Beaver re-introductions should be encouraged with cooperation sought from both the WGFD and landowners.

Continue to identify and correct impacts from improved and un-improved roads, which affect water flows and/or soil erosion into riparian/wetland habitats.

Continue vegetation plantings within the watershed to improve species and structure diversity.

Continue to protect spring and seep water sources from trampling and compaction due to livestock and wild horses.

Continue to work cooperatively with permittees and landowners, as well as with local, state, and federal agencies to improve management of riparian/wetland habitat.

STANDARD 3 – UPLANDS

Upland vegetation on each ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance.

1) Characterization

The descriptions of plant communities, common species, and where they occur, are still accurately portrayed in 20032 watershed assessment, with one small exception. Mountain big sagebrush was

described as ranging in height from 10 to 30 inches, and with canopy cover reaching 50 to 60 percent. Through the use of black-lighting much of the taller sagebrush growing on side-slopes at mid-to-higher elevations, which was believed to be basin big sagebrush, is actually mountain big sagebrush. Therefore, heights of this sub-species may reach up to six feet and canopy cover can reach up to 80 percent. This method of distinguishing between sub-species based in their luminescence has also defined the elevational transition from Wyoming big sagebrush to mountain big sagebrush as occurring between 6800 and 7200 feet.

2) Issues and Key Questions

Although much of the discussion in the 2003 watershed assessment is still valid and should be reviewed, factors have changed over the last 10 years that lead to new and valid questions. For livestock grazing, the need to manage for new species of concern like the pygmy rabbit raises the question of what types of BMPs for livestock grazing will adequately provide habitat for the pygmy rabbit? In terms of species of heightened concern, such as Greater Sage-Grouse, what type of livestock management will provide for expansion of large perennial bunchgrasses such as Indian ricegrass, bottlebrush squirreltail and bluebunch wheatgrass without just increasing the little bluegrass and thickspike wheatgrass already present to improve visual security in nesting habitat for Greater Sage-Grouse? In terms of recent droughts in 2006 and 2012, how can BLM and permittees improve their planning and/or adapting to these conditions to improve both resource and operational management during and after these tough years?

In terms of vegetation treatments, the creation of core area habitat for Greater Sage-Grouse has had the side effect of reducing the potential to prescribe burn to improve aspen health and to address shrub decadence in mountain big sagebrush and mountain shrub habitat important for mule deer, so how do biologists and range managers work within the guidelines of this policy and still be able to use prescribed fire in the ecosystem? Due to the Greater Sage-Grouse issue and slow recovery of mountain big sagebrush at lower elevations, the BLM has increased the use of tebuthiuron to “thin” big sagebrush stands, will the use of this chemical have the desired effect and is it an adequate replacement to the use of fire?

In terms of wildlife, the increase in the Baggs elk herd from 2000 in 1980 to between 10,000 and 12,000 currently, raises the question of what is the proper size of this elk herd in terms of forage, and competition with livestock and other wildlife for habitat? Mule deer are the species of concern (between elk, mule deer and antelope) for being below population objectives and with habitat health a concern, what habitat management or other steps, such as reducing competition from elk, need to be taken to improve mule deer populations and their winter habitat? With the recent augmentation of bighorn sheep into the Seminoe Mountains, and with future plans to do the same on Ferris Mountain, how will bighorn sheep compete with elk and should elk population objectives for this area be adjusted without incorporating the knowledge about the interaction between these two big game species and the future population objectives for bighorn sheep?

In terms of oil and gas development, there has been increased use of slender wheatgrass as a cover crop, with good success in stabilizing the soil and reducing weed infestations, but questions remain on how long it will persist, and can lower initial seeding rates still achieve similar short-term success but allow understory native species to recover faster? In Greater Sage-Grouse core area habitat or perhaps in any suitable habitat, where native forb seed sources are still totally inadequate, should the BLM relax its use of native plant guidelines to include desirable legumes in the reclamation seed mixtures that would benefit this sensitive species? In low reclamation soils, what level of reclamation will be accepted if restoration of the native plant community is not achievable?

3) Current Conditions

The one trend observed at nearly all monitoring transects across the watershed is the inverse of the bare ground trend described in Standard One, that litter and plant cover have increased substantially over the last 20 to 40 years. And more recently established trend transects show levels of litter and plant cover that compare with current levels observed in allotments with long-term trend transects. On a more specific basis, the longest trend comes from 3 x 3 plots established in seven allotments during the 1970s, pace frequency transects in three of these same allotments, line point transects established in four allotments during the 1990s, and more recently line point and sample point transects. Across all allotments in the watershed, the plant composition is made up of native, mostly desirable species. In nearly all of the oldest trend sites in sage-grass communities there have been decreases in rhizomatous wheatgrass and increases in bunchgrasses, primarily Indian ricegrass, needle-and-thread, and little bluegrass. The latter seemed to increase substantially during the last wet period in 2009-2011, and filled in the interspaces between sagebrush and larger bunchgrasses. During this same period there were high numbers of new plants established, including large bunchgrass species, forbs, big sagebrush, and rabbitbrush. The other observed change in the overview plot pictures has been the increased amount of big sagebrush (Standard 3 – Page 1 photos). In the saltbush communities, there were similar downward trends in desirable bunchgrasses as observed in the Upper Colorado River watershed, and increased amounts of desirable shrubs, such as bud sage, winterfat and saltbush. The cheatgrass and alyssum present in some communities did not appear to increase, and in the 2012 drought year there was almost no annual plant growth.

Winter use of shrubs by antelope and mule deer is not as severe in this watershed when compared to areas, such as Baggs and Muddy Creek in the Upper Colorado River watershed or the Baggot Rocks area in the upper North Platte River watershed. There are big sagebrush stands south of Bairoil and Lamont, around the Stone Ranch, and on the west side of Seminoe reservoir that receive moderate to heavy browsing, but there are not a lot of dead sagebrush plants in these areas compared to other watersheds. Most of the big sagebrush receives light to moderate browsing and appears to be in good condition. This is also true for the mountain mahogany and mixed mountain shrub stands primarily found around the Ferris and Seminoe Mountains, which receive light to moderate browsing (for the most part) and appear to be in good condition. The variety of species being browsed on the Ferris Mountains is notable, rather than selecting for just Wyoming Big sage, bitterbrush and mountain mahogany, big game here are making good use of black sage, three-tip sage, green rabbit brush, chokecherry, service berry, and both gooseberry current and wax currents . Vegetation trend relating to big game crucial winter rangeares limited to a few longer term trend locations, more recently established trend transects, and observations of use areas.

Vegetation treatments over the last 10 years totaled 45,227, divided into wildfires (13,829 acres), prescribed burns (7,655 acres), tebuthiuron applications (23,543 acres), and mechanical cutting of conifers (200 acres). The single largest change were the 8,600 acres that burned in the 2012 Ferris Mountain wildfire, which when combined with the 1,400 acre managed wildfire in 2011 on the south side of Ferris Mountain, resulted in nearly 25 percent of the mountain changing from late seral conifer dominated habitat to early seral herbaceous and shrub habitat. The combination of wildfires and prescribed burns on Seminoe Mountain resulted in 10,529 acres treated between 2011 and 2013, or approximately 41 percent of the project area. In the Ferris Mountain wildfire, twenty transects were established in three different community types: conifer, mountain big sagebrush, and mountain big sagebrush/bitterbrush. New aerial vegetation cover averaged 19 percent in the shrub types and 6 percent in the conifer type. Common herbaceous plant species included green needlegrass, king-spike fescue, bluebunch wheatgrass, oniongrass, rhizomatous wheatgrass, wild hollyhock, mint, chickweed, groundsmoke, and Oregon grape. Shrub and tree response was dominated by evergreen ceanothus (buckbrush), which is not common in the late seral vegetation composition. Ceanothus comprised 98

percent of the shrub/tree stem counts in the conifer type areas and 87 percent in the shrub types. The highest single plot density for ceanothus was 45 plants per square meter, and the highest transect densities (90 square meter total area) were 17 plants per square meter in a mountain big sagebrush site and 11 plants per square meter in one conifer type. Re-sprouting shrubs such as snowberry, chokecherry, Rocky Mountain maple, and silver and Wyoming three-tip sagebrush are all responding well. There are already new mountain big sagebrush and bitterbrush seedlings; however, overall survival of bitterbrush was very low due to the late July wildfire (about 10 percent estimated). There has also been the emergence of cotton horsebrush, an early seral species that commonly increases after prescribed burns. Aside from the Ferris and Seminoe Mountains, treatments have primarily occurred in mountain big sagebrush through the use of tebuthiuron to thin sagebrush, since most of these sites are suitable and/or core habitat for Greater Sage-Grouse. The principle prescribed burns were in the upper Separation Creek region south of Rawlins and the Riddle Creek area southwest of Bradley Peak. Young mountain big sagebrush, snowberry, bitterbrush and rabbitbrush are the principle shrubs returning to these sites. Although these areas are primarily shrub dominated plant communities, encroachment by conifers is occurring in some areas, such as in the vicinity of Bradley Peak (Standard 3 – Page 2 photos).Chemical application projects using Tebuthiuron have resulted in increased herbaceous cover and forage production (Standard #3 – Page 3 photos). On the Fillmore allotment (2001) Shipping/Horse pasture project grass and forb production comparison in 2005 showed a difference of 175 pounds per acre on untreated sites versus 395 pounds per acre on treated areas. Vegetation treatments that do not decrease big sagebrush canopy cover to less than 15 percent do not count as disturbance, so the use of Tebuthiuron to thin sagebrush stands is receiving more support by biologists; and therefore, more acres are being treated with this chemical. However, even through soil sample collections and getting recommended rates of application of Tebuthiuron from the University of Wyoming, the prediction in sagebrush kill rates is still not a perfect science. To compensate for this, more treatments are occurring as small blocks or strips of application to ensure a good mosaic of live and dead sagebrush (Standard #3 – Page 4 photo). Mechanical treatments consisting of conifer cuttings in riparian and aspen habitat have occurred along Whiskey, Cherry, Pete, and Pole Canyon Creeks on the west and north sides of Ferris Mountain. These have resulted in the release of aspen and other riparian shrubs (Standard #3 – Page 4 photo).

Long-term trend data for reclamation of disturbance from oil and gas energy development is not available, but more short-term data is being collected by the BLM and energy companies. Although the amount and timing of precipitation in the desert can greatly affect vegetation growth, efforts put into reclamation have greatly improved. Improved efforts include more intensive pre-planning, planting species more closely adapted to the site (including soil type), adaptation of BMPs, and collection and review of annual monitoring data. Best Management Practices used by many companies include snow fencing and mycorrhizae soil inoculants.

Oil and gas disturbances are often classified in two types of reclamation statuses, the first is interim reclamation and the second is final reclamation. The goal of interim reclamation is to provide site stability to meet the long term goal of final reclamation. Successful final reclamation is classified in the Rawlins RMP as having 80 percent vegetative cover, 90 percent dominate species, no noxious weeds, and erosion less than or equal to the surrounding. In the Great Divide Basin, 2012 monitoring included determining basal ground cover. Basal ground cover was collected using primarily three different methods; line point intercept, step point intercept, and ocular estimations. This data revealed wells in abandoned status exhibited 80 percent basal ground cover of desirable species relative to the surrounding area 39 percent of the time. The 2012 monitoring data displays that 29 percent of the abandoned wells had a 90 percent or higher basal vegetative weed cover (mainly Halogeton) over the surrounding basal vegetative cover. Some of the most frequent grass species encountered during reclamation monitoring were thickspike wheatgrass, Indian ricegrass, bluebunch wheatgrass, bottlebrush squirreltail, and crested wheatgrass. While forbs were very sparse on the abandon well

sites, some species encountered were Hood's phlox, prickly phlox, and bearded-tonguePenstemon sp. Also encountered most frequently for shrubs were Gardner's saltbush, green rabbitbrush, and Wyoming big sagebrush.

For sites that are in a production status (Producing, Shut-in, Temporarily abandoned) the success rate of achieving 80 percent basal desirable vegetative ground cover is much lower at 6.8 percent. Just over six percent of sites in a production status have 90 percent or higher basal canopy cover for weeds (mainly Halogeton).

Several energy development companies are now fencing their well pads to improve the success of their reclamation efforts. The use of slender wheatgrass as a cover crop has also increased initial vegetation cover that is quickly stabilizing soils and reducing weeds, leaving only the question of how fast will the slender wheatgrass fade out and will native perennial species in the seed mix and/or adjoining native range fill in like expected. In the Fillmore allotment, Alfalfa falcata was planted in the reclamation to introduce a legume that would add nitrogen to the soil as well as diversify habitat for wildlife (Standard #3 – Page 5 photo).

Fecal samples for wild horses have been collected in the Lost Creek and Stewart Creek HMAs as a comparison to similar data collected in the Adobe Town HMA. Results for Lost Creek were collected in the fall and winter of 2002-03 and 2007-08, with the first sample following a drought and the second sample following a good precipitation year. In 2003, wild horse diets were dominated (72%)by grass and grass-like species in November, with the balance being mostly saltbush and winterfat. The percentage of shrubs rose to 65 percent in January and dropped to 43 percent in March, consisting primarily of winterfat. By comparison, in 2007-08 wild horse diets averaged 74-78 percent grass and grass-like species for all three samples in November, February and April. Fecal samples in the Stewart Creek HMA, along the Lost Soldier creek drainage, were collected in November 2007 and May 2009, in addition to samples for antelope and cattle. Wild horse diets were very similar for each time period, averaging 99 percent grass and grass-like species in the spring and 97 percent in the fall. Cattle diets were 93 percent grass and grass-like species in the spring compared to 76 percent in the fall along with 22 percent shrubs, consisting primarily of sagebrush. Antelope diets were 84 percent shrubs (sagebrush) in the spring along with 15 percent grass and grass-like species, as compared to 100 percent shrubs (mostly sagebrush) in the fall.

4) Reference Conditions

Please refer to the current conditions discussed in the 2003 watershed report.

5) Synthesis and Interpretation

The general context of discussion from the 2003 watershed assessment is still mostly valid and won't be repeated here. Grazing and browsing by livestock, wildlife, and wild horses continues to have the most direct effect on vegetation; however, drought, vegetation treatments and wildfires, oil and gas development, and recreation use are also significant factors. Monitoring for livestock use and trend is the most common, and even though the current trend direction is positive, there are still many questions relating to rate of change, understanding how to affect change in desirable bunchgrasses, and gaining more knowledge of site characteristics and how they affect changes in species composition. Cooperative monitoring with the permittee and the University of Wyoming has been conducted for two decades in the Upper Separation watershed (Standard #3 – Page 5 photo). These cooperative efforts have document improvements in plant communities as well as providing annual production measurements. Additional and continued monitoring is needed to document and evaluate vegetation recovery and trend following the burning on both Ferris and Seminoe Mountains, and to help guide and support future treatments. There is also a need to incorporate the effects of climate swings into data

interpretations. In general, vegetation trends are good, from the changes observed with livestock management and oil and gas reclamation, to restoring shrublands and aspen woodlands.

Of all resources users, livestock grazing continues to have the largest impact upon vegetation, however, much has been changed with grazing practices and range improvements to improve vegetation vigor and composition. This has primarily occurred through adjusting the duration and season of use by livestock to provide for time during each growing season for plant growth, root expansion, and energy replenishment. Levels of livestock grazing use during the assessment period have fluctuated between 43 percent and 56 percent of the total permitted use levels of approximately 153,000 AUMs (see Figure 4). Livestock nonuse is due to adjustment to climate, market conditions, and in some cases changes in the livestock operation. In some areas it may also be due to avoidance of natural gas field development (traffic, dust, and disturbance/activity), and high amounts of halogeton to reduce mortality in cattle and winter sheep operations. Permittees, in general, have become more conservative in their stocking rates, particularly in response to drought years and the need to provide for plant vigor and recovery, and to better understand the value of leaving forage and litter for soils improvement. Over time there has also been a reduction in the smaller sized operations, probably relating to the economics in the number of livestock it takes for a ranch family to survive. Currently more operations in business are the medium to large sized ranches. There is still a lot of work, or refining of current management, that needs to be done in future years, but the recent monitoring has showed improvement as compared to 16 to 40 years ago. Whether analyzing the reduced bare ground or the inverse of litter and plant cover, the numbers have improved to more acceptable range, under 40 percent bare ground in sagebrush communities and around 50 percent in saltbush steppe communities. These numbers are likely to decrease with long-term monitoring necessary to establish a natural range that incorporates climate affects. Since the majority of grazing is by cattle, trend for desired bunchgrasses are important to follow. Just looking at sagebrush sites, desirable bunchgrasses (primarily needle-and-thread grass, Indian ricegrass, and bluebunch wheatgrass increased in some areas, whereas thickspike/western wheatgrass declined on some sites. However, desirable bunchgrasses have declined in some saltbush plant communities and little bluegrass has increased in many areas. Is little bluegrass more prolific in responding to three wet years better than other grasses, or will young little bluegrass give way to the bigger grasses? Plant communities dominated by upland sedges and needle-and-thread appear to be very stable and may not change very much in the future with the existing grazing management. Most livestock producers are working with the BLM and following good rotations, so at this point, accurate monitoring and feedback to these permittees regarding small corrections and letting them know what is happening is the most important task for the RFO to complete. Development of grazing rotations and shortened duration of use is already resulting in increased warm-season grasses in riparian habitat (little bluestem) and there is also potential for these types of changes in uplands with plants such as sand dropseed, prairie sandreed, three-awns, and potentially other species. More specific or targeted monitoring may be needed to document these types of plant composition changes. This must also incorporate the needs of sensitive species, like Greater Sage-Grouse or other wildlife, to further refine management changes already implemented.

Wildlife management relates directly to vegetation in terms of forage and habitat use by big game, which in this area is elk, mule deer, antelope, and the recent augmentation of bighorn sheep into the Seminoe Mountains, and indirectly in terms of management implications upon vegetation, such as the Greater Sage-Grouse core area habitat policy. Elk numbers and management especially in the Sierra Madre herd have been of higher interest, particularly after the multiple dieoffs described in Standard 4 under wildlife. The expansion of elk populations in the Atlantic Rim area may also be affecting vegetation, but data is lacking in regards to potential impacts. Cooperative efforts between the BLM and WGFD to quantify standing forage prior to winter use by elk is ongoing. Although WGFD is increasing hunter pressure to reduce herd size, they are also working with the BLM to collect more data to determine if the population objectives for this herd can be raised. This will likely take a year or two,

but analyzing carrying capacity biologically for winter range is important to make the right decision. As long as the BLM can manage for healthy sagebrush communities, antelope needs will likely be addressed. However, effects of browse use in areas with higher use levels requires closer monitoring to ensure maintenance of big sagebrush composition and cover. The tremendous response of evergreen ceanothus following wildfires on Ferris Mountain, will enhance browsing species for big game, particularly mule deer. It should be monitored to document how long this will available before converting to other species, although the burn site at Rush Creek is seven years old and still is dominated by this species. Other impacts upon vegetation by wildlife are more subtle, but may still be important to document and monitor. Grasshopper outbreaks recently occurred east of Muddy Gap and around Seminoe Reservoir, with the primary effect of reducing herbaceous vegetation for one or two growing seasons. Higher awareness of pocket gophers is increasing the observation of locations where this species is found, and raises questions about their role in vegetation succession. Observations of older sites affected by pocket gophers appear to have fewer mat forb species and more grass dominance than adjacent, un-affected black sagebrush (shallow loamy) plant communities. The issues with Greater Sage-Grouse are discussed under livestock grazing and vegetation treatments.

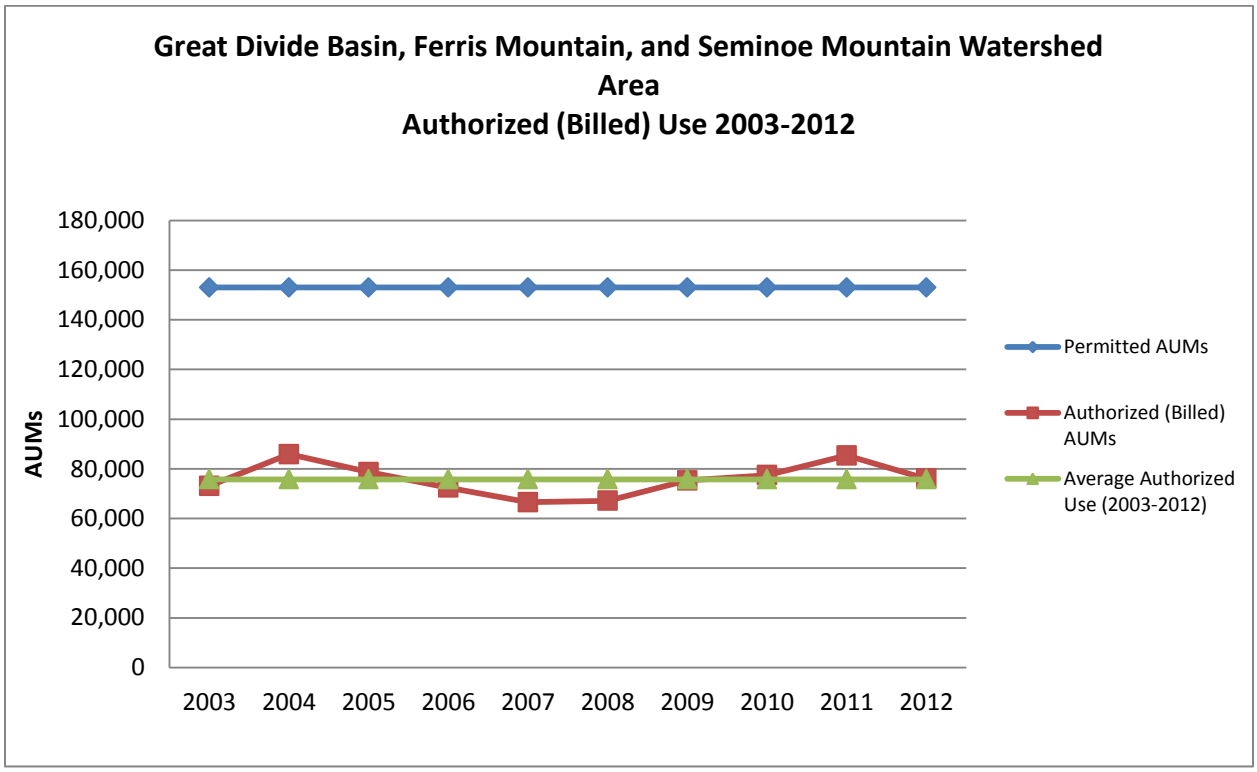


Figure 4: Livestock Use in the Great Divide Basin, Ferris Mountain, and Seminoe Mountain Allotments.

Wild horse effects on vegetation relate to their population levels, distribution of use, and diet selection. Population levels over the last 10 years have varied from the AML of 220 for HMAs totally within the Rawlins FO (70 for Lost Creek HMA and 150 for Stewart Creek HMA). Wild horse gathers removed 398 horses in 2002-03, 552 in 2006, 592 in 2010, and 319 in 2012, for a total of 1,861 wild horses over this period. This kind of variation (above the AML) makes it impossible to assess if the AML is a good number for range health, along with incorporating use and impacts from livestock and wildlife. It's imperative that the BLM keep wild horse numbers at AML during the next 10 years, and establish more monitoring to define use areas, forage competition, and other information needed to analyze impacts between wild horse, livestock and wildlife. It may also be necessary to better document movement of wild horses between HMAs to more accurately evaluate individual AMLs, with the area of greatest concern being the boundary fence between the RFO and Lander Field Office (LFO) which is let down

each winter. Although livestock waters are often used by wild horses, and a number of solar equipped pumps on water wells are operated by the BLM in these two HMAs, there is still a need for more water sources in the Lost Creek HMA. More water sources would keep wild horses from moving within or outside the HMA in search of water and reduce grazing pressure around the few reliable water sources during drought years.

The effect of climate swings, whether it is drought (gets the most attention) or years with above average precipitation, on vegetation results in part in species evolution and natural selection. Much of the recent effects have been through personal observations. The drought in 2006 resulted in the death of big sagebrush in drier locations, and in desirable bunchgrasses like Indian ricegrass and bottlebrush squirreltail in saltbush communities in some locations. The impacts due to the drought in 2012, which was one of the driest years on record, is not yet fully known. However, there are numerous areas where black sage on shallow wind-swept hillsides has died or is very decadent, as compared to nearby big sagebrush in draws and swales that were not affected. Prickly-pear cactus have also been observed dying off but it is unknown whether this is more likely due to insects or disease than drought related. On the other hand, the three year wet period from 2009-2011 resulted in the establishment of many new young plants in all vegetation communities. While re-reading trend transects over the last two years, many seedlings of grasses, forbs and shrubs were observed and noted in the record. The most notable grasses were the Indian ricegrass in saltbush communities and needle-and-thread on sandy sites. The most common forb with new young plants was Hood's phlox, but others such as buckwheat and clover, were also seen. Sagebrush and rabbitbrush were the most common shrubs observed on non-saline sites, as compared to bud sage and winterfat seedlings on saline sites. Production was obviously good as was litter on the ground, but other benefits to upland vegetation probably occurred but were not as noticeable. Future and more intensive monitoring may yield more light on the effects of climate swings on vegetation in the RFO.

Vegetation treatments have totaled approximately 55,000 acres within the watershed over the last 25 years and during this time prescribed burning was the principle form of treatment prior to 2001. Over the last 10 years the use of tebuthiuron has been more common. Treatments during the 1950s to 1960s primarily involved the use of the chemical 2,4-D, which killed all broad-leaved plants including forbs and the target species big sagebrush. The use of tebuthiuron has seen more use recently due to concerns with Greater Sage-Grouse habitat and the ability to "thin" big sagebrush rather than kill large amounts of it. Aerial applications in blocks or strips are also being implemented to ensure a "patch-work" type result since rate calculations based on soil samples are not always accurate, and it is easier to work around habitats that biologists do not want treated. Tebuthiuron has also proven to be more beneficial in terms of easier application with a wider "window" for treatment than prescribed burning. In addition, annual species, such as alyssum, don't increase as much in low elevation mountain big sagebrush treatments. After prescribed burning, recovery of mountain big sagebrush to pre-treatment levels is averaging about 30 years at higher elevation sites with deeper soils. As with many burns, the more herbaceous competition there is with big sagebrush, the slower it will return. Where understory vegetation is poor and sagebrush reseeding is good, sites may return to pre-treatment levels in as few as 20 years. Mountain shrubs are often species of concern in regards to burning, particularly bitterbrush, but recovery has been good with cooler, fast-moving fires. Aspen health in general in the Atlantic Rim area south of Rawlins in general is still decadent in many stands. However, leaf blight effects documented during the 1980s and 1990s seem to not be as severe and most older trees have dead tops but very good suckering around them. Competition between competing shrubs like serviceberry and big sagebrush, remain management issues. Aspen burning is most effective during dry years; however, concerns over the amount of area burned in Greater Sage-Grouse core area habitat are not supportive of burning under these conditions. Mechanical treatments are not as effective as burning, but it may be worth trying treatment of sagebrush around aspen to see if it will stimulate suckering and future expansion of these stands. Although these areas are critical in supporting mule deer and other wildlife,

the high cost of mechanical treatments limits the amount of area treated. The long-term decline in mountain mahogany shrublands warrant management actions to reverse this trend, particularly juniper removal, which may also be beneficial in other shrublands within mule deer crucial winter range. Greater Sage-Grouse research shows nesting hens seeking out more dense big sagebrush than previously reported, which between birds moving to higher elevations and sagebrush canopy and height selection, indicates most hens are nesting in mountain big sagebrush plant communities. This research, along with other factors, will need to be considered when planning future vegetation treatments, along with following the new policies regarding Greater Sage-Grouse . The current and future status of this species will also require more intensive monitoring of livestock grazing to ensure residual and new vegetation is adequate for nesting habitat used by Greater Sage-Grouse. Until 2011, very few large wildfires had occurred in the watershed; however, several small fires occurred on the Ferris Mountains, the latest in 2007 on upper Rush Creek. This burn site, of approximately 200 acres, responded with a large amount of ceanothus that is still present, although it has been browsed by elk and mule deer (Standard #3 – Page 6 photos). The re-sprouting of other desirable shrubs and aspen, and the return of most grasses and forbs, should restore healthy shrublands and aspen woodland in the burned areas. Livestock grazing rest of most of this habitat (and late deferment on other areas), high acreage of burned areas, and currently low numbers of elk and mule deer in this area should also help to enhance vegetation recovery. The aerial application of "Plateau" in the fall of 2012, and planned future application in 2014, to control cheatgrass should also improve the response of native species after the recent wildfires. Dissemination of monitoring information of the vegetation response to permittees, the public, and BLM staff will help ensure the implementation of future treatments on Ferris Mountain, where 75 percent of this area still needs to be treated.

Oil and gas development is primarily guided by avoidance of other management resource values, such as cultural, wildlife, hydrology, soils, and engineering. Therefore, most surface disturbing activities attempt to avoid such values. Development usually occurs in the most common vegetation plant communities of Wyoming including Wyoming and mountain big sagebrush, saltbush steppe, and to a lesser extent greasewood flats. Primary concerns relate to post-disturbance reclamation and weed control. As discussed above, general reclamation practices have improved, due in part to obtaining better soils information prior to disturbance, prompt reclamation efforts due to stronger enforcement of On-Shore Order #1, use of cover crop species, and greater industry commitment. The requirement of soils testing has helped to avoid more problematic soils or in providing the steps necessary to take before and after disturbance for more successful reclamation. Joint industry-agency workshops conducted over the last 10 years have helped identify common problems, and solutions, and disseminate information among all parties involved. Although reclamation has improved considerably, there are a few remaining problem areas to work on. This includes increasing vegetative basal ground cover on interim and final reclamation. In general, there is a lack of native forb seeds to use in reclamation, so restoring vegetation to a native plant community relies on forb reseeding from adjacent rangelands. While most local pipelines are not an issue, interstate pipelines include areas that need reseeding and more particularly adequate weed control. Letters have been sent out in recent year instructing accountable companies to manage weed infestation, but it has been difficult to communicate the severity of this issue. Pipelines with halogeton infestation that cross winter sheep grazing allotments are of particular concern as this species is poisonous to sheep. While reduced from previous years, weed infestations such as halogeton remain problematic in some interim and final reclamation attempts. Dust from roads is always present, but expansion of roads and disturbance from drilling creates additional dust sources, which can coat vegetation up to one-quarter mile away, and may be affecting plant vigor, production and palatability. Roads along drainages continue to capture and re-direct runoff, increasing desertification effects to vegetation below the road that is not receiving as much moisture. As a whole, the energy industry has greatly improved its reclamation and weed control practices over the last 10 years with just the few areas mentioned above that need resolution.

Impacts of off-road travel upon vegetation are based primarily on personal observations. Increasing numbers of two-track roads, occur where people drive across vegetation (rather than walking) to riparian meadows. Stream banks are torn up where people shouldn't be driving. In areas with steeper slopes or private land that can control access, there appear to be few of these impacts. The "Walk In" program of the WGFD working with private landowners has been very helpful in promoting people walking and reducing vehicle impacts. Two other factors may also be helping to reduce the off-road vehicle impacts upon vegetation. The first is the expanded use of UTVs that appears to have a lighter impact than four-wheel drive pickups, four-wheelers or motorcycles. The second is the shed antler collection closure during the winter and early spring months when conditions may be wet and muddy. The RFO is scheduled to write and implement a travel management plan that should help address current problem areas. However, in order for this to be successful it must be supported by public land users, and implementation will take a lot of time, meetings, education, signage and enforcement. Two-track roads remaining will require water-barring to reduce erosion, as well as reclamations funds for roads that become closed. As more people choose to recreate on the BLM-Administered public lands, this issue may dwarf all others discussed above.

6) Recommendations

Due to the diversity, vigor, productivity, high native species composition, current documented or observed trends in plant communities, current livestock management, current wildlife populations and wild horse numbers, and management responsibilities shared and demonstrated by the various agencies, industry, and agricultural businesses in this watershed, it is determined that the majority of upland vegetation in the Great Divide Basin/Ferris and Seminoe Mountains watershed is meeting Standard #3 – Upland Plant Health, with the following described exceptions. Aspen stands, although healthier than they appeared 10 years ago, still do not meet the standard for vegetation health due to their reduced acreage (compared to historical), competition from conifer encroachment, and concerns over disease persistence and general clone health. Conifer encroachment into shrub stands, long-term lack of fire, and the disease and decadence within the conifers in terms of white pine blister rust, mistletoe, and the mountain pine beetle epidemic are still affecting upland plant health on the Ferris and Seminoe Mountains. Total acreage of areas previously not meeting this standard was approximately 24,000 acres. The recent wildfires and prescribed burns have reduced this down to about 20,000 acres still needing some form of treatment to improve upland plant health (Standard 3 – Page 7 photos). Livestock grazing is a component in the management scenario of these plant communities, but it is not the principle factor in non-attainment of this Standard. The following recommendations would expand upon the success already achieved and help to meet desired resource conditions in the future.

Continue to implement vegetation treatments to restore plant communities with diverse species, age classes, and cover types. Inventory and prioritize aspen stands for treatment, explore more use of mechanical cuttings, analyze effects of past treatments, and work more closely with the High Desert District (HDD) and WGFD to continue the use of prescribed fires for aspen health within the Greater Sage-Grouse core area habitat. Ensure adequate monitoring of the long-term effects of vegetation treatments and wildfires is occurring and information learned is being disseminated to all parties.

Maintain wild horse populations in the Antelope Hills, Lost Creek and Stewart Creek WHMAs at their current AMLs of 245-339 wild horses (total for three areas) (Map #6). Ensure adequate monitoring of distribution, diet, and other important factors to determine if this AML is the appropriate level to manage for in regards to vegetation and livestock and wildlife use, as well as other multiple uses of the public lands. Develop additional water sources to improve wild horse distribution, reduce pressure around natural water sources, and reduce the potential of wild horses moving outside the WHMA due to lack of adequate sources of water.

Continue to work closely with WGFD and Saratoga Encampment Rawlins Conservation District (SERCD), in monitoring effects of wildlife on vegetation, response of vegetation to treatments, and changes in wildlife populations or management to promote healthy vegetation in crucial winter ranges and across the entire watershed.

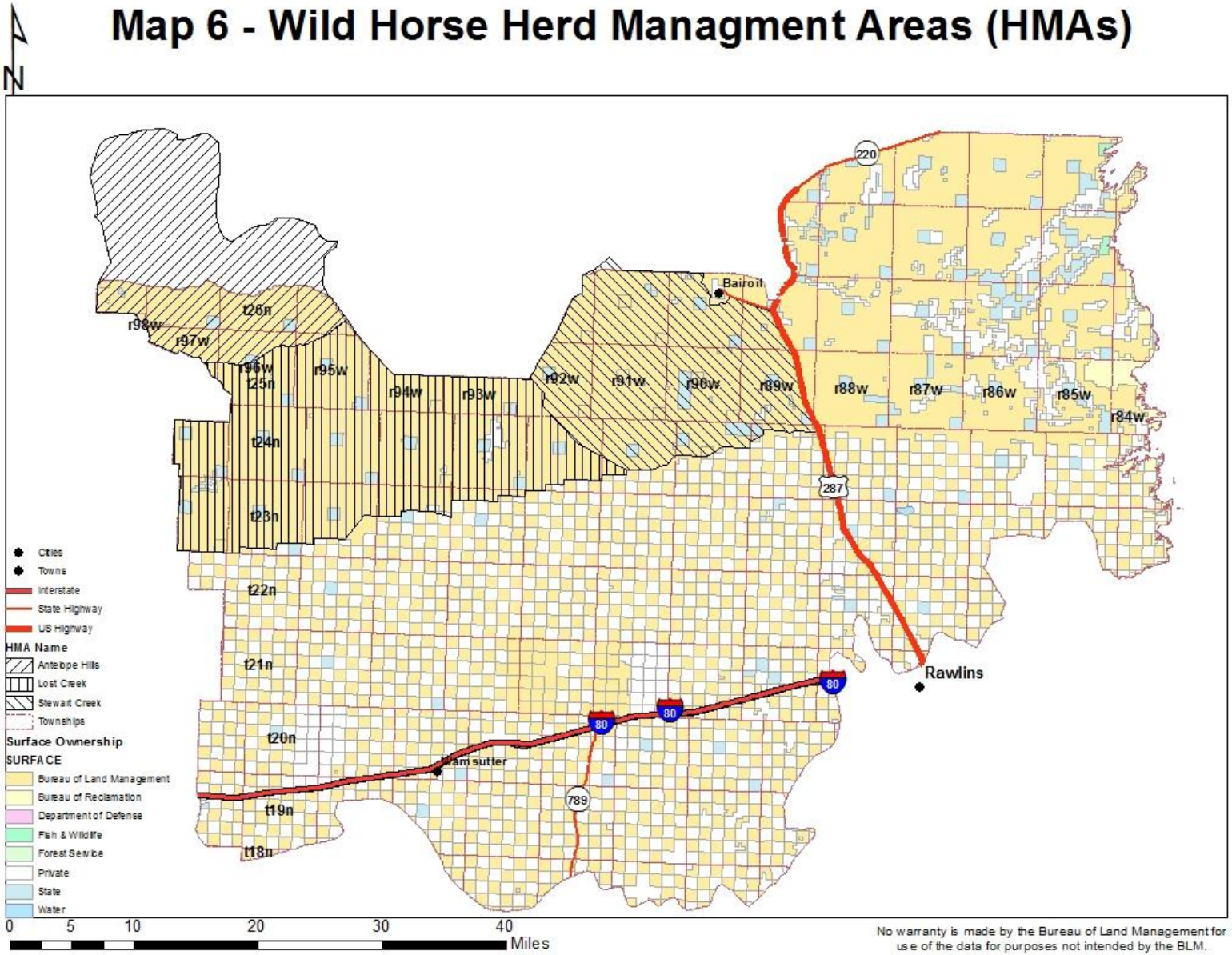
Continue to manage use of BMPs for livestock grazing. This primarily relates to manipulating the season, duration, and distribution of livestock use to meet desired resource objectives for riparian/wetland habitats. Specific dates and timing of use must be determined on a case-by-case basis for the plant community involved, method of treatment(s), specific plant community objectives, or other pertinent factors.

Continue to identify and correct impacts from improved and un-improved roads, which affect water flows and/or soil erosion. Incorporate watershed and soils management needs into the development and implementation of a RFO travel management plan.

Continue to work closely with energy development companies on the successful reclamation and monitoring of vegetation after surface disturbing activities have occurred. Work with NRCS, SERCD, WGFD, and other parties involved in revising ESDs, incorporating what is already known, gathering additional information, and using the information to help describe desired plant communities and what it will take to achieve this RMP objective.

Expand education about the public's role in public land management, particularly regarding impacts from roads and off-highway vehicular activities. Work closely with other partners in this area, including the WGFD in regards to seasonal closures for antler collecting and the potential long-term benefit to upland vegetation health.

Map 6 - Wild Horse Herd Managment Areas (HMAs)



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STANDARD 4 – Wildlife/Threatened and Endangered Species/Fisheries Habitat Health and Weeds

Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.

Wildlife/Threatened and Endangered Species

1) Characterization

The plant communities/habitat types that occur within this watershed have been described under the Characterization section of Standard 2 (Wetland/Riparian Health) and Standard 3 (Upland Plant Health). These habitat types vary greatly in their ability to support wildlife, depending on species composition, age classes, single-species dominance, horizontal and vertical structure, type abundance, mosaic mix with other habitats, and proximate to features, such as migration corridors and winter concentration areas. Over 374 species of wildlife, including birds, mammals, reptiles, and amphibians, are known or expected to occur within the RFO. In general, aquatic habitats support the greatest diversity of species (up to 165) and are the least common types of habitat, comprising about one percent of the landscape. Aspen woodlands are next in terms of supporting the greatest species diversity, followed by big sagebrush, conifer, mountain shrub, and juniper woodland habitat types. The woodland plant communities are also uncommon in occurrence, comprising about four percent of the landscape. Big sagebrush and sagebrush/mixed grass are the most common plant communities in the watershed. Habitats with the lowest diversity of plants, cover, and structure, such as sand dunes, badlands, and rock outcrops, correspondingly support the lowest number of wildlife species (USDI-BLM, 2003).

The RFO RMP management goals are to (1) manage for the biological integrity and habitat function of terrestrial and aquatic ecosystems to sustain and optimize distribution and abundance of all native, desirable non-native, and Special Status fish and wildlife species; (2) manage or restore habitat to conserve, recover, and maintain populations of native, desirable non-native, and Special Status Species consistent with appropriate local, state, and federal management plans and policies; (3) manage for quality habitat to support the introduction, reestablishment, augmentation, transplant, stocking, and expansion of identified high-priority fish and wildlife species; and (4) manage wildlife and fish habitat to support recreational and educational benefits and opportunities for the public. There are four identified management objectives that enable the BLM to reach these goals and they include: (1) maintain, restore, or enhance wildlife habitat in coordination and consultation with other local, state, and federal agencies and consistent with other agency plans, policies, and agreements; (2) maintain, restore, or enhance T&E species habitat; (3) maintain, restore, or enhance designated BLM State Sensitive Species habitat to prevent listing under the ESA; and (4) maintain, restore, or enhance habitat function in crucial winter range (USDI-BLM 2008).

Wildlife species that can be observed in the watershed include big game, particularly antelope and mule deer in open habitat, and elk in shrub and woodland habitat. Raptors are also very abundant and include golden and bald eagles, ferruginous, red-tailed, and Swainson's hawks, burrowing owls, harriers, and owls within the watershed. Commonly observed mammals within the watershed include coyotes, red foxes, badgers, beaver, muskrats, cottontail and jackrabbits, prairie dogs, ground squirrels, voles and mice. Shorebirds and waterfowl include great-blue herons, avocets, stilts, phalaropes, sandpipers,

coots, Canada geese, white pelicans, and various ducks (primarily dabblers). Songbirds vary by habitat type, with sparrows, meadowlarks and horned larks most commonly observed in sagebrush and saltbush areas, and warblers, swallows and flycatcher species observed in riparian habitats. Horned lizards and prairie rattlesnakes are the most common reptiles, while tiger salamanders and leopard frogs (Standard #1 – Page 1 photo) are commonly seen amphibian species.

Species of Interest or Concern

There are numerous species of special interest and or concern that inhabit the watershed area, or use parts of the watershed area for migration, transitional zones, and/or other corridors. There are five antelope herds, three elk herds, three mule deer herds, and one bighorn sheep herd – all managed by the WGFD - that are located, or are partially located, within the watershed. In addition, other species of special interest and or concern within the watershed include Threatened, Endangered, Candidate, and Proposed species (T&E species), BLM-State Sensitive Species, and raptors. Accounts of these species are described in the following paragraphs. Crucial winter range for big game species are shown on Map #7. In addition, there is parturition habitat for bighorn sheep located within the Ferris Mountains.

Big Game Species – Antelope, Elk, and Mule Deer

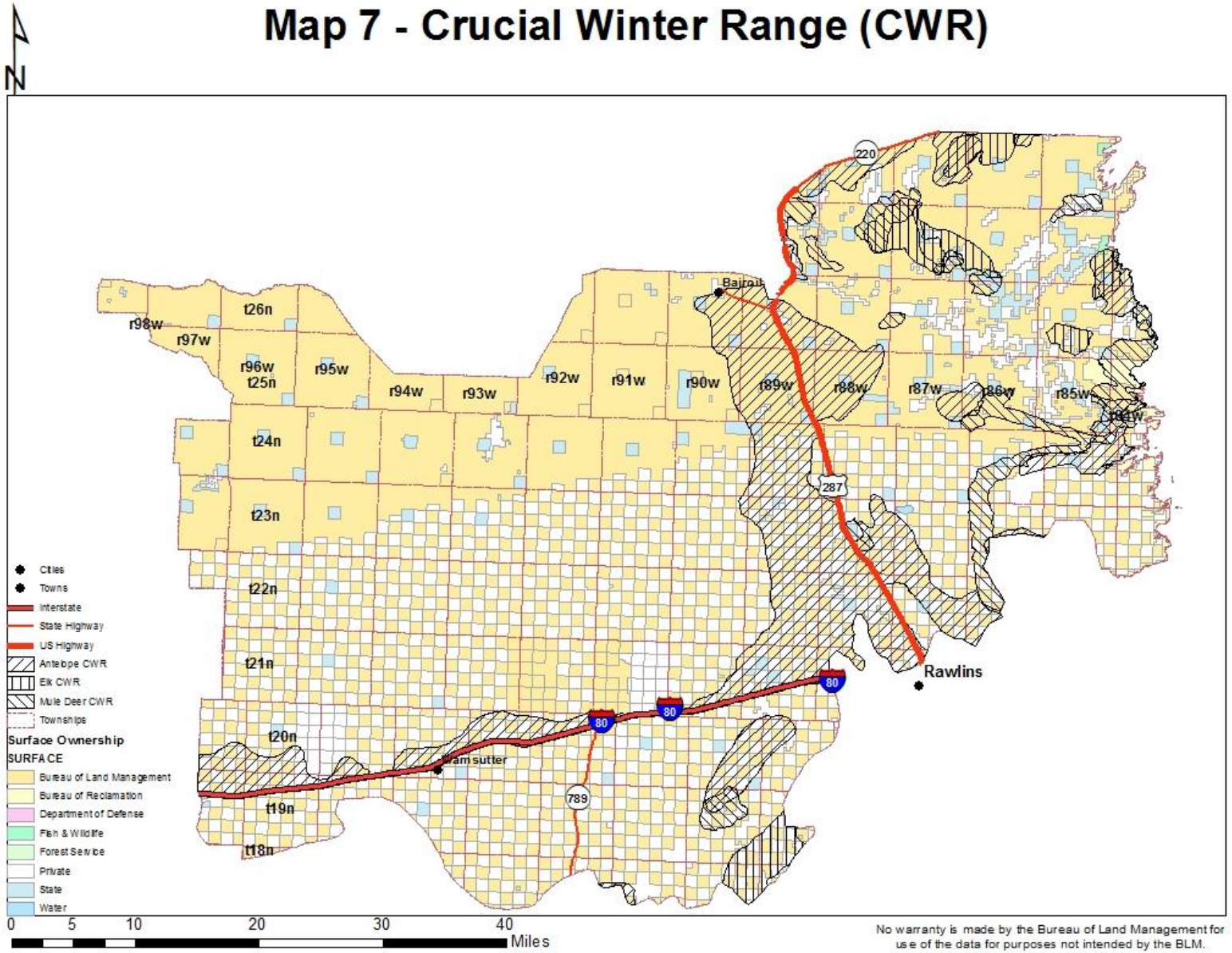
Antelope

Pronghorn antelope are the most visible and numerous of big game species in the Great Divide Basin. Antelope rely heavily on Wyoming big sagebrush habitat, in addition to other "open" communities, such as saltbush steppe, greasewood, and short grasslands. During the winter, antelope diets consist primarily of Wyoming big sagebrush. However, spring and summer diets include higher amounts of forbs, grasses, and other shrubs. There are five antelope herd units located within, or partially within, the watershed area. These herd unit areas are identified as the: (1) Baggs Herd Unit; (2) Bitter Creek Herd Unit; (3) Red Desert Herd Unit; (4) South Ferris Herd Unit; and (5) North Ferris Herd Unit. Refer to the 2003 Report for a description of the locations of these antelope herd units and unique wildlife attributes that each area may contain.

Elk

Elk are the largest of the big game wildlife species common in the watershed. Elk normally prefer staying close to hiding cover, so are most often associated with conifer and aspen woodlands or tall shrublands. These are found on Atlantic Rim and the Ferris and Seminoe Mountains. However, elk have also become established in the tall sagebrush habitats on the Rawlins Uplift and the Continental Divide north of Creston. They prefer grasses and have a high diet overlap with cattle, but will include more forbs in their spring diets and more shrubs in their winter diets. There are three elk herd units located within, or primarily within, the watershed area. These herd unit areas are identified as the: (1) Ferris Herd Unit; (2) Shamrock Herd Unit; and (3) Sierra Madre Herd Unit. Refer to the 2003 Report for a description of the locations of these elk herd units and unique wildlife attributes that each area may contain.

Map 7 - Crucial Winter Range (CWR)



No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by the BLM.

Mule Deer

Mule deer are the second most abundant big game species following antelope in the watershed. However, mule deer are not evenly distributed across the landscape. They prefer areas with hiding cover and higher precipitation sites with forbs, which tend to occur close to the mountains, rims, and along stream drainages and lakes. Mule deer select forbs and grasses when they are greener and more nutritious, shifting primarily to shrubs in the fall and winter. Compared to antelope, mule deer prefer a mixture of sagebrush and other shrubs during the winter. There are three mule deer herd units located within, or partially within, the watershed area. These herd unit areas are identified as the: (1) Ferris Herd Unit; (2) Chain Lakes Herd Unit; and (3) Baggs Herd Unit. Refer to the 2003 Report for a description of the locations of these mule deer herd units and unique wildlife attributes that each area may contain.

Bighorn Sheep

Bighorn sheep (Ovis Canadensis) were originally translocated into the Seminoe and Ferris Mountains in 1958 and additional animals were relocated until 1985. The original number of animals relocated to the Seminoe and Ferris Mountains totaled 237. The bighorns relocated to the area, were trapped out of the Whiskey Mountain Wildlife Habitat Area near Dubois, Wyoming. The animals trapped were high-elevation; migratory bighorns which had evolved with the area's seasonal climatic variations (i.e vegetation phenology cycles), and migrations along steep elevation gradients from summer to winter ranges. None of the above topographic/climatic features are present or required of sheep within the Seminoe and Ferris Mountains, and it is these factors along with lambing dates, reduced habitat health, and the presence of adjacent domestic sheep herds, that were attributed to the decline of the originally translocated bighorns.

Raptors

There are several raptor species that have been observed within the watershed area, and in some cases their nests have also been identified. Raptors known to have nests within the area include the ferruginous hawk, golden eagle, Swainson's hawk, great-horned owl, Cooper's hawk, prairie falcon, red-tailed hawk, burrowing owl, northern harrier, and kestrel. Although nests have not been identified for the northern goshawk, long-eared owl, short-eared owl, and sharp-shinned hawk, these species have the potential to nest within the watershed. The ferruginous hawk, burrowing owl, and northern goshawk have been identified as BLM-State Sensitive Species and are discussed in that section of the document as well. Refer to the 2003 Report for a description of these raptor species and the unique wildlife habitats within which each species breeds and nests.

Threatened, Endangered, Proposed, and Candidate Species

There are five T&E species that occur, or have the potential to occur, and five species – the North Platte River species – that do not physically occur within this watershed, but that may be affected by actions occuring within the watershed. These include the black-footed ferret, Canada lynx, Greater Sage-Grouse, blowout penstemon plant, Ute ladies' tresses plant, and the North Platte River species (least tern, pallid sturgeon, piping plover, whooping crane, and western prairie fringed orchid). The T&E species located within the RFO, but that do not occur, or do not have the potential to occur and/or are not affected by actions within the watershed include the Preble's meadow jumping mouse, yellow-billed cuckoo, Colorado butterfly plant and Critical Habitat, Wyoming toad, and the Colorado River species (bonytail chub, Colorado pike-minnow, humpback chub, and razorback sucker). Refer to the 2003 Report for a further description of these species and their associated habitats.

Black-footed Ferret

The black-footed ferret is considered endangered and is the rarest and most endangered mammal in North America and receives full protection under the Endangered Species Act of 1973, as amended (ESA). This species lives in prairie dog towns and relies on prairie dogs for both food and shelter (USDI-BLM 2003).

Canada Lynx

The current status of the Canada lynx is threatened. Lynx occur in boreal, sub-boreal, and western montane-forests of North America. Snowshoe hares are the primary food source, but other prey species include red squirrels, ground squirrels, mice, voles, porcupine, beaver, and ungulates as carrion, or occasionally, as prey (USDI-FWS, 2001).

Greater Sage-Grouse

Greater Sage-Grouse (grouse) are common inhabitants within the watershed. Grouse populations have exhibited long-term declines throughout North America and no one causal factor has been identified for these declines. Wyoming supports the largest populations of grouse, more than all the other states combined; however, there are population declines occurring in Wyoming as well. Grouse are a sagebrush obligate species and each aspect of their life cycle requires slightly different elements within the sagebrush communities. Movements to winter ranges are slow and meandering and occur from late August to December. During the winter months, grouse feed almost exclusively on sagebrush leaves (USDI-BLM 2003). Winter habitat has been identified for parts of the watershed and will be finalized using GIS. Winter habitat must be assessed during very specific time periods and under specific winter conditions.

The watershed contains Greater Sage-Grouse Core Habitat located within four Core Management Areas. It is the policy of the BLM to manage Greater Sage-Grouse seasonal habitats and maintain connectivity in these identified Core areas in support of the population management objectives set by the State of Wyoming. These guidelines are consistent with the Wyoming Governor's Sage-Grouse Implementation Team's Core Population Area Strategy, the Wyoming Governor's Executive Order (EO) 2001-5, the BLM National Sage-grouse Habitat Conservation Strategy, National BLM Policy manual 6840 (which provides direction for the management of BLM Sensitive Species), and the Washington Office policy guidance, including the following Instruction Memorandums (IMs): IM No. WO-2011-138 (Sage Grouse Conservation Related to Wildland Fire and Fuels Management), IM No. WO-2010-071 (Gunnison and Greater Sage-Grouse Management Considerations for Energy development), IM No. WO-2012-043 (Greater Sage-Grouse Interim Management Policies and Procedures), and IM No. WO-2012-044 (BLM National Greater Sage-Grouse Land Use Planning Strategy) (USDI-BLM, IM No. WY-2012-019, February 10, 2012). The Core Management Areas include the Hanna, South Rawlins, Greater South Pass, and Natrona Core Areas. The Hanna Core Area has 235,611 acres, the South Rawlins Core Area has 20,848 acres, the Greater South Pass Core Area has 662,608 acres, and the Natrona Core Area has 97,320 acres located within the watershed; for a total of 1,016,388 acres within the watershed defined as Greater Sage-Grouse Core Habitat.

Blowout Penstemon Plant

The blowout penstemon is considered an endangered species and receives full protection under the ESA (Standard #4 – Page 1 photo). The plant is located in areas of sparsely vegetated shifting sand dunes or

wind carved depressions (blowouts) (USDI-BLM 2003). Since 2002, two new sub-populations have been discovered in the watershed. At this time there are a total of three extent populations comprised of 19 sub-populations. Currently, the Blowout Penstemon ACEC is being considered for expansion based on a RMP remand for the Ferris Dunes. A revision of the current *Blowout Penstemon Recovery Plan* is underway which will incorporate the Wyoming populations.

Ute Ladies' Tresses Plant

The Ute ladies' tresses plant is considered a threatened species under the ESA. This plant is a perennial, terrestrial orchid and is endemic to moist soils in mesic or wet meadows near springs, lakes, seeps, and riparian areas within the 100-year flood plain of perennial streams ranging from 4,300-7,000 feet in elevation (USDI-BLM 2003). Surveys at the individual project level have occurred for the plant; however, no new populations have been encountered.

North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, and Western Prairie Fringed Orchid

The North Platte River species include the endangered interior least tern, pallid sturgeon, and whooping crane and the threatened piping plover and Western prairie fringed orchid. All of these species are downstream residents of the Platte River; however, the whooping crane is a migrant along the central Platte River in Nebraska (USDI-FWS, 2001).

BLM State Sensitive Species

Many wildlife and plant species are experiencing population declines. The BLM developed a sensitive species list to better manage species and their habitats and to date there are 29 BLM-State Sensitive Species that have the potential to occur within the watershed. These species include eight mammals, thirteen birds, three amphibians, and five plants (**Table 3**). The BLM State Sensitive fish, reptiles, and amphibians that may occur within the watershed are discussed in the Fisheries section. The BLM State Sensitive mammals that have the potential to occur in the watershed, or that may migrate and/or travel through the watershed area, include the long-eared myotis, fringed myotis, spotted bat, Townsend's big-eared bat, white-tailed prairie dog, Wyoming pocket gopher, pygmy rabbit, and swift fox. The BLM State Sensitive birds that have the potential to use the area include the white-faced ibis, northern goshawk, ferruginous hawk, peregrine falcon, long-billed curlew, burrowing owl, sage thrasher, loggerhead shrike, Brewer's sparrow, sage sparrow, trumpeter swan, mountain plover, and bald eagle. The BLM State Sensitive plants that may occur, or have the potential to occur in the watershed include the Gibben's beardtongue, cedar rim thistle, persistent sepal yellowcress, Laramie false sagebrush, and limber pine. A description of the habitat type each species is associated with is shown in **Table 2**. Refer to the 2003 Report for a further description of these species and their associated habitats.

The objective of the sensitive species designation is to ensure that the BLM considers the overall welfare of these species when undertaking actions on public lands, and do not contribute to the need to list the species under provisions of the ESA. The lack of demographic, distribution, and habitat requirement information compounds the difficulty in taking management actions for many of these species. It is the intent of the sensitive species policy to emphasize the inventory, planning consideration, management implementation, monitoring, and information exchange for listed sensitive species in light of statutory and administrative priorities (USDI-BLM, 2001).

Table 2: BLM State Sensitive Species That May Occur within the Watershed

Mammals

Common Name	Scientific Name	Habitat Types
Long-eared myotis	*Myotis evotis*	Conifer and deciduous forests, caves and mines
Fringed myotis	*Myotis thysanodes*	Conifer forest, woodland, caves and mines
Spotted bat	*Euderma maculatum*	Forest, woodlands, caves and mines, rock crevices, man-made structures
Townsend's big-eared bat	*Corynorhinus townsendii*	Forests, basin-prairie shrub, caves and mines
White-tailed prairie dog	*Cynomys leucurus*	Basin-prairie shrub, grasslands
Wyoming pocket gopher	*Thomomys clusius*	Meadows with loose soil
Pygmy rabbit	*Brachylagus idahoensis*	Basin prairie and riparian shrub, tall sagebrush in dense patches, sandy and loose soils
Swift fox	*Vulpes velox*	Grasslands

Birds

Common Name	Scientific Name	Habitat Types
White-faced ibis	*Plegadis chihi*	Marshes, wet meadows
Northern goshawk	*Accipiter gentilis*	Conifer and deciduous forests
Ferruginous hawk	*Buteo regalis*	Basin-prairie shrub, grassland, rock outcrops
Peregrine falcon	*Falco peregrinus*	Tall cliffs
Long-billed curlew	*Numenius americanus*	Grasslands, plains, foothills, wet meadows
Burrowing owl	*Athene cunicularia*	Grasslands, basin-prairie shrub
Sage thrasher	*Oreoscoptes montanus*	Basin-prairie shrub, mountain-foothill shrub
Loggerhead shrike	*Lanius ludovicianus*	Basin-prairie shrub, mountain-foothill shrub
Brewer's sparrow	*Spizella breweri*	Basin-prairie shrub
Sage sparrow	*Amphispiza billineata*	Basin-prairie shrub, mountain-foothill shrub
Trumpeter swan	*Cygnus buccinator*	Lakes, ponds, rivers.
Mountain plover	*Charadrius montaus*	Short grass and mixed grass prairie, openings in shrub ecosystems, prairie dog towns
Bald eagle	*Haliaeetus leucocephalus*	Primarily along rivers, streams, lakes and waterways

Plants

Common Name	Scientific Name	Habitat Types
Cedar Rim thistle	*Cirsium aridum*	Barren, chalky hills, gravelly slopes, & fine textured, sandy-shaley draws at 6,700-7,200 feet in elevation
Persistent sepal yellowcress	*Rorippa calycina*	Riverbanks & shorelines, sandy soils near high water line, reservoirs and playas at 4,300-6,800 feet in elevation
Laramie false sagebrush	*Sphaeromeria simplex*	Cushion plant communities on rocky limestone ridges and gentle slopes at 7,500-8,600 feet in elevation
Limber pine	*Pinusflexilis*	Timberline and at lower elevation with sagebrush; associated species are Rocky Mountain Douglas fir, subalpine fir, Rocky Mountain juniper, mountain mahogany and common juniper

Mammals

Long-eared myotis: The primary habitat for long-eared myotis is coniferous forest and woodland, including juniper, ponderosa pine, and subalpine spruce-fir. It is also occasionally associated with cottonwood riparian areas, basins, and sagebrush grasslands where roost sites are available (Oakleaf and others 1996; Wilson and Ruff 1999). It is most likely found in areas close to a water source (Hinman and Snow 2003). However, it may occur more frequently in suitable habitat near rock outcroppings or cliffs (Manning and Jones 1989). The long-eared myotis forages primarily over rivers, streams, and ponds within the forest-woodland environment. It also forages over open areas such as campgrounds, small forest openings, and edges (Schmidt 2003), although foraging areas are most likely close to a water source. Little is known about the winter habitat of the long-eared myotis, although it probably

hibernates in caves and abandoned mines. Also, very little is known about the migration and hibernation patterns of the long-eared myotis.

Fringed myotis: The fringed myotis is found in a wide variety of habitats, including coniferous forests, juniper woodlands, grasslands, and basin-prairie shrublands. It usually occurs at middle elevations, but occasionally as high as spruce-fir habitats (O'Farrell and Studier 1980; Clark and Stromberg 1987). It is probably most common in xeric woodlands, such as juniper, ponderosa pine, and Douglas-fir (WBWG 1998; Adams 2003). Although it is often found in arid environments, it has a lower urine-concentrating ability than most bats, so probably must remain within commuting distance of drinking water (Keinath forthcoming). It typically forages over water, along forest edges, or within forests and woodlands (Schmidt 2003; Keinath forthcoming). Potential threats include recreational caving and other roost disturbances, mine reclamation, renewed mining, timber harvest practices that remove large-diameter snags, building demolition and remodeling, bridge replacement, pesticides, and other contaminants. The species is extremely sensitive to disturbance at roost sites, particularly maternity colonies, more so than other myotis species (O'Farrell and Studier 1980).

Spotted bat: The spotted bat occupies a wide variety of habitats, from desert scrub to coniferous forest, although it is most often observed in low deserts and basins, and juniper woodlands (Clark and Stromberg 1987; Oakleaf and others 1996). It often occurs in association with canyons, prominent rock features, and permanent water sources (WBWG 1998; Priday and Luce 1999a; Priday and Luce 1999b). The ability of the spotted bat to concentrate its urine indicates that it may have evolved in arid environments, such as deserts and grasslands (Chung-MacCoubrey 1996). In desert environments, the spotted bat forages in canyons, open areas, or over riparian vegetation; in montane habitats, it forages over meadows, along forest edges, or in open coniferous woodland (Navo and others 1992; Storz 1995; WBWG 1998; Altenbach and others 2002). The spotted bat roosts in cracks and crevices of high cliffs and canyons, in buildings, caves, or abandoned mines (Oakleaf and others 1996; Altenbach and others 2002), although cliffs are the only roosting habitat in which reproductive females have been documented (Schmidt 2003). All recorded occurrences of spotted bats in Wyoming were associated with canyons containing cracks and fissures, high bare rock walls, and rock ridges close to a permanent water source (Priday and Luce 1999b). Little is known about its winter habitat, although it may roost in caves and abandoned mines to some extent (Altenbach et al 2002). Potential threats include recreational climbing and other roost disturbances; mining and quarry operations that destroy roosting habitat; water impoundments; and pesticides and other contaminants.

Townsend's big-eared bat: The Townsend's big-eared bat occupies a variety of xeric to mesic habitats, including coniferous forests, juniper woodlands, deciduous forests, basins, and desert shrublands, and is absent only from the most extreme deserts and highest elevations (Clark and Stromberg 1987; Pierson and others 1999). Although it is often associated with xeric habitats, it may be limited to areas with reliable, accessible sources of drinking water (Gruver and Keinath forthcoming). It forages primarily along forest and woodland edges, riparian corridors, and in open areas near wooded habitat, although it may avoid open, grazed pasture land (WBWG 1998; Sherwin and others 2000; Fellers and Pierson 2002; Gruver and Keinath forthcoming). Although the Townsend's big-eared bat occurs in a wide variety of habitats, its distribution is strongly correlated with the availability of caves and abandoned mines for roost sites and (Pierson et al 1999) during its life cycle, including maternity roosts, day and night roosts, reproduction, and hibernacula. These activities require different microclimatic conditions, so populations must have multiple sites available for different seasons (Dobkin et al, 1995)

White-tailed prairie dog: White-tailed prairie dogs are located throughout the watershed. In addition, there was a 2006 IM (IM No. WY-2006) which addressed the prairie dog management policy for public lands in Wyoming. In November 2004, the USFWS determined that listing the white-tailed prairie dog

was not warranted. However, white tailed prairie dogs are managed as a sensitive species for Wyoming-BLM. It is the policy of the Wyoming BLM to take steps to conserve prairie dogs and the BLM, RFO, has a protocol, *Rawlins Field Office Prairie Dog Colony Mapping Protocol*, that is used to map prairie dog towns and identify their habitats.

Wyoming pocket gopher: The Wyoming pocket gopher was not addressed in the last assessment; however, this species is located within the watershed. Information on the distribution, status, and habitat use was conducted by Keinath and Beauvais in 2006 (Keinath and Beauvais 2006). Despite historic habitat descriptions, ridge-top topography does not seem to uniquely characterize suitable habitat for Wyoming pocket gophers, although most sites seem to be at least moderately sloped. They can be found in many different soil types, although rarely in soils with greater than 60 percent clay. It appears that vegetation composition may be more important, with this species occurring primarily in small "islands" of low vegetation within a sagebrush matrix. Wyoming big sagebrush is often a minor component, with cushion plants, grass, rabbit brush, and other low shrubs and forbs dominating the immediate vicinity. Wyoming pocket gophers have NOT been found in flats dominated by greasewood, valley bottoms, sand dunes, or areas where medium to tall Wyoming big sagebrush dominates the vegetation community. The species has been petitioned for listing under the federal ESA, primarily due to the extensive oil and gas development occurring in southern Wyoming (Keinath and Griscom, 2009). Surveys on-site inspections of proposed projects are completed to determine if species are present. The BLM, RFO, has a protocol, *Final Wyoming Pocket Gopher Protection Measures (February 2011)*, which is used to map Wyoming pocket gopher habitats and apply protection measures to proposed projects. Currently, not much is known about the level of disturbance this species can withstand.

Pygmy rabbit: The pygmy rabbit was not addressed in the last assessment; however, this species is located with the watershed (Standard #4 – Page 1 photo). The pygmy rabbit is the only rabbit species in North America known to dig its own burrows. As such, the rabbit depends on relatively deep, soft, loosely compacted soils in which to build its burrows. Another requirement is the presence of tall, relatively dense stands of sagebrush. Species, such as Wyoming big sagebrush and Basin big sagebrush, provide suitable habitat for the rabbit. Loss of dense sagebrush habitat is the greatest concern for the species. Surveys on-site inspections of proposed projects are completed to determine if species are present. The BLM RFO has a protocol, *Final Pygmy Rabbit Protection Measures (February 2011)*, which is used to map pygmy rabbit habitat and apply protection measures to proposed projects. Currently, not much is known about the level of disturbance this species can withstand, research is being conducted within gas fields of the watershed to learn more about species tolerance and adaptability.

Swift fox: The swift fox has the potential to occur within the watershed. The species was petitioned for listing as Threatened under the ESA in 1992. In 1995, the species was listed as warranted but precluded by the USFWS due to higher priorities and placed on the ESA Candidate list. The swift fox was removed from the candidate list in January 2001 (Grenier et al 2005). Swift foxes eat rabbits, prairie dogs, ground squirrels, mice, birds, reptiles, amphibians, berries, and seeds. Swift fox population numbers in the wild are unknown, but they are found in less than 40 percent of their historic range. The swift fox is native to the Great Plains region of North America. Today the swift fox can be found in fragmented, smaller populations in portions of Montana, South Dakota, Wyoming, Nebraska, Colorado, Kansas, Oklahoma, New Mexico, and Texas. Historically, their range included prairies in central North America, extending north to central Alberta, Canada, and south to central Texas, east-west from western Iowa to Colorado, Wyoming, and Montana. Swift foxes are nocturnal, vocal, and non-territorial. They spend more time underground in their burrows than any other canid. Although they are social animals, they keep one mate throughout their lifetime. One of the main threats to the swift fox is habitat loss as a result of conversion of grasslands for agriculture. In the past, they were impacted by trapping and incidental poisoning intended for wolves and coyotes. As part of federal eradication campaigns, poisoning also

reduced swift fox food sources, such as prairie dogs and ground squirrels. Climate change looms as an additional threat to the swift fox (Defenders of Wildlife 2013).

Birds

Loggerhead shrike, sage thrasher, Brewer's sparrow, sage sparrow: These neo-tropical migratory birds are located in basin prairie and mountain foothill shrub habitats and are known to occur within the watershed.

White-faced ibis, trumpeter swan, long-billed curlew: The white-face ibis inhabits marshes and wet meadows, the trumpeter swan inhabits lakes, ponds, and rivers, and the long-billed curlew inhabits grasslands, plains, foothills, and wet meadows. Although these species have the potential to occur within the watershed, this occurrence would be rare.

Bald eagle: Bald eagles are found in conifer, cottonwood-riparian, and river ecosystems and forage in adjacent upland rangelands (USDI-BLM 2003). There are known bald eagle nests located along the nPlatte River drainage within the RFO. There is winter habitat located to the northeast of the watershed, along the North Platte River in the Casper Field Office, just northeast of the Rawlins-Casper Field Office lines. Surveys during on-site inspections of proposed projects are completed to determine if species are present. The BLM, RFO, has a protocol, *Final Bald Eagle Protection Measures (May 2012)*, which is used to map bald eagle nests and apply protection measures to proposed projects

Northern goshawk: This species inhabits conifer and deciduous forests and has the potential to be located on the Ferris and Seminoe Mountains within the watershed. At this time, no nests have been located; but there is habitat in both mountain ranges for this species to occur. Surveys during on-site inspections of proposed projects are completed to determine if species are present. If a nest is detected, then protection measures are applied to proposed projects.

Ferruginous hawk: The ferruginous hawk inhabits basin-prairie shrub, grasslands, rock outcrops, and artificial structures and is located within the watershed. There are numerous ferruginous hawk nests, both natural and artificial, that have been identified within the watershed. Surveys during on-site inspections of proposed projects are completed to determine if species are present. If a nest is detected, then protection measures are applied to proposed projects.

Peregrine falcon: The peregrine falcon inhabits tall cliffs and has been known to nest in both the Ferris and Seminoe Mountains within the watershed. Surveys during on-site inspections of proposed projects are completed to determine if species are present. If a nest is detected, then protection measures are applied to proposed projects.

Mountain plover: The USFWS proposed listing the mountain plover as threatened in February 1999, without critical habitat, under the authority of the ESA. The mountain plover is a bird found in short-grass prairie and shrub-steppe landscapes at both breeding and wintering locales. The birds winter in southern California (USDI-BLM 2003). Surveys during on-site inspections of proposed projects are completed to determine if species are present. The BLM, RFO, has a protocol, *Final Mountain Plover Protection Measures (February 2011)*, which is used to map mountain plover habitats and apply protection measures to proposed projects.

Burrowing owl: The burrowing owl inhabits grasslands and basin-prairie shrub and is located within the watershed. Surveys during on-site inspections of proposed projects are completed to determine if species are present. The BLM, RFO, has a protocol, *Final Burrowing Owl Plover Protection Measures*

(February 2011), which is used to map burrowing owl habitats and apply protection measures to proposed projects.

Plants

Cedar Rim thistle: The plant is usually taller, with greenish, glabrous upper leaf surfaces and has fruit with a yellow rim at the top. The plant flowers and fruits from June through August and although is endemic to the Wind River and the Green River areas, it has the potential to occur within the watershed. The Cedar Rim thistle inhabits barren, chalky hills, gravelly slopes, and fine-textured, sandy-shaley draws at 6,700-7,200 feet in elevation (Fertig et al 1994).

Persistent sepal yellowcress: The plant inhabits riverbanks and shorelines, usually on sandy soils near high water lines, and playas, at 4,300-6,800 feet in elevation. The flowering season occurs from May through July and the fruiting season occurs from June through September. The plant has been located in North Dakota, Montana, Wyoming, and Northwest Territories of Canada (Fertig 1994). It has been located within the Hay Reservoir, as well as the Seminoe Reservoir areas within the RFO.

Laramie false sagebrush: This plant has a single, large, head-like inflorescence composed of two or more separate, sessil flower heads. The flowering and fruiting period occurs from May through August. The plant is endemic to south-east Wyoming in Albany, Carbon, Converse, and Natrona Counties. The plant inhabits cushion plant communities on rocky limestone ridges and gentle slopes and is located at 7,500 to 8,600 feet in elevation (Fertig 1994). Although the plant has not been located within the watershed to date, it does have the potential to occur in the area.

Limber pine: The species is located in timberline and at lower elevations associated with sagebrush. Timber species associated with the species include Rocky Mountain Douglas fir, subalpine fir, Rocky Mountain juniper, mountain mahogany, and common juniper. The species is located within the watershed and in 2012 was added to the BLM Sensitive Species list since the last assessment. Limber pine has been undergoing a downward trend and it is estimated that approximately 50 percent of current stands currently are dead.

2) Issues and Key Questions

There are several issues and key questions that have been identified for wildlife species. Wildlife habitats within the watershed include riparian - willow-waterbirch, aspen and cottonwood woodlands, wet forested meadow areas, open aquatic, sagebrush-grass communities, mountain shrub, saltbush steppe, conifer forest, and rock-land areas. The major issues that concern wildlife species include:

(1) The ***overall health of the ecosystem including the quality and quantity of a diversity of habitat types that species depend on throughout their life cycles:***
   a. quantity: need for disturbance,such as fire, disease, and/or climatic change;
   b. quality: disease, vegetation cover types, age distribution, diverse age-class structure; factors that affect the availability of these habitat types for wildlife, which includes livestock management, oil and gas development, and inter- and intra-species competition for available forage and associated diet overlap

(2) ***Existing and potential disturbance of these habitat types to wildlife species***: includes impacts to habitats from fencing; livestock management practices; oil, natural gas, and coal-bed methane development; vegetative treatments; wild horse management; private land development; and recreation activities including OHV uses.

The following describes issues and key questions that pertain to specific wildlife and their associated habitats as well as those impacts that may occur as a result of activities in the area:

(1) *Fences* – which affect animal movements;
(2) *Livestock management practices* – water developments, season of use which affect animal movements, disturbance, and forage competition;
(3) *Oil, natural gas, and coal-bed methane development* – which causes disturbance and removes forage from pipelines, utility corridors, roads, pad developments, and cause noise;
(4) *Vegetation treatments* – which affect animal movements and remove forage;
(5) *Wild horse management* – which removes forage;
(6) *Private land development* – which affect animal movements, reduces forage and disturbs big game species during sensitive time periods;
(7) *Lichen poisoning in the Sierra Madre elk herd and possibly other units* ;
(8) *Recreation activities* – includes hiking, camping, hunting, OHV uses, and falconry;
(9) *Poor forage quality and lack of open habitat* - which affect animal movements, reduces forage and disturbs big game species during sensitive time periods;
(10) *Prey availability* – which affects animal movements, breeding and nesting locations; and
(11) *Disease -*

Species of Interest and Concern:

Big Game Species: Antelope, Mule Deer, Elk, and Bighorn Sheep

Issues that relate to antelope, mule deer, elk, and to some degree bighorn sheep, vary across the watershed and include, fences; livestock management practices; oil, natural gas, and coal-bed methane development; vegetation treatments; wild horse management; private land development; and poor forage quality and access to habitat.

There are over 1,000 miles of fencing in the assessment area, most of which consists of old style, woven wire fences constructed in the past for domestic sheep with one or two strands of barbed wire on top. During migrations and severe winter conditions, big game have to expend additional time and energy to get through fences which may reduce their chances for survival, or they may get stuck in fence corners where they are likely to die. Fence locations requiring annual maintenance due to big game movements are good indicators of where fence modifications should occur to reduce both the cost of maintenance and impacts to big game species. There have been issues related to general and individual antelope, elk, and mule deer herd units from fences, which are identified below:

(1) *Antelope Herd Units*: Woven wire fences prevent passage under or through them, forcing antelope (particularly young) to find low spots, such as gully crossings where they can get under the fence. Old fences built to control cattle were made with four to six strands of barbed wire. Although the bottom strands are lower than the height recommended in BLM's fencing standards, antelope can often pass through these fences or find low spots to go underneath them.

(2) *Elk Herd Units*: Elk movement is affected by fences differently than with antelope. Elk, being considerably larger, will generally jump over fences; however, young elk pass under or through fences and can get stuck behind a fence they can't get through or may get a leg caught while attempting to jump a fence. Elk, which summer in high elevations, usually do not have many fences to pass over until they migrate in the spring and fall to and from winter ranges.

(3) *Mule Deer Herd Units*: The impacts from fences to mule deer are similar to those described for elk. Young deer often have to pass under or through fences, so that woven wire fences raise the greatest concerns. Old style fences built for cattle (50-55 inches tall) present considerable problems for both young and adult elk and mule deer. In the Chain Lakes Mule Deer Herd unit, fences are not as big a concern to mule deer because the mule deer are more localized in year-long range; therefore, movements are not as great, but it is still an issue in other areas.

Questions: Can the BLM continue to modify existing sheep style (woven wire) fences to reduce the impacts to big game migrating between spring/summer/fall and winter ranges. What locations should have the highest priority to be modified initially and in future years? How can a program be implemented to modify fences where needed in the short-term, and correct all fences to meet BLM standards in the long-term?

Livestock management practices include the development of new water developments and their management, as well as protection of natural seeps and streams. There have been issues related to general and individual antelope, elk, and mule deer herd units from livestock management, which are identified below:

(1) *Antelope Herd Units*: When new water sources are developed, which are usually for summer cattle use, antelope and other wildlife will use them and depend upon them, especially during times of drought. However, if these water developments are wells, they may be turned off or the generator moved to a different location when the cattle are moved and the wildlife must look for water elsewhere. When the water they were using is no longer available, antelope have been stuck in certain pastures (due to fences) and this causes stress on this species. In other situations, water developments have been created for wildlife, such as guzzlers or other projects, resulting maintenance of these guzzlers has been an issue in the past. About 90 percent of all livestock use is by cattle, which have a low overlap in diet similarities to antelope; however, cattle can have significant impacts on riparian habitat that is important to antelope. In the South Ferris Antelope Herd Unit, a conversion from sheep to cattle on the Stone Ranch should have reduced forage competition for antelope on a year-round basis, and particularly during winter months. Without the need for woven wire fencing, modifications in key locations initially and across a large part of the ranch long-term will remove barriers to antelope movement and increase animal survival.

(2) *Elk Herd Units*: Competition for forage between elk and cattle occurs to some degree. There is an approximately 80 percent diet overlap for these two species. Today, it appears that livestock use is not affecting elk numbers. The distribution of livestock use will affect where forage is left and where elk have to move in order to find forage. Two cases of this happening are the Ferris Elk Herd using the Beef Acre area, as well as private hay meadows, and the Baggs Elk Herd using the Fillmore Creek drainage and Red Rim area. Water development and improved riparian and upland range conditions are also affecting elk distribution and the length of time they stay in a particular area.

(3) *Mule Deer Herd Units*: Livestock management practices that have the greatest effect on mule deer are fencing (already discussed above), type of livestock use (cattle versus sheep), and management impacts to mule deer habitat, particularly riparian plant communities. Sheep diets are very similar to mule deer and antelope, so competition for forage can be an

important factor. However, current use levels by sheep only make up ten percent of all livestock use, compared to historic domestic sheep use. Use by cattle and mule deer primarily overlap in riparian habitat. In limited ares, spring through fall use of riparian habitat by cattle has degraded the value of these sites for mule deer use, especially the woody plants which are important as forage and cover. Use of best management practices for cattle has improved many of these areas.

Questions: How can the situation of trapped antelope by fences be avoided? Are there certain times or locations when water should remain available, either through continual water pumping or development of other sources, and if so, what impacts are there to rangeland as a result? How can this situation be rectified in order to maintain the use of these facilities for the long-term benefit of antelope and other wildlife? In riparian pastures or exclosures, which exclude livestock, what mixture of vegetative species and structure should be promoted for antelope species? Should more attention be paid to changes in elk distribution and use patterns, and how does this reflect back on the management of cattle or other activities in these areas? How can the use of mule deer habitat protection measures (BMPs) become the standard operating procedure so that mule deer/livestock issues are no longer present?

Oil, natural gas, and coal-bed methane development has been occurring throughout the watershed since the last assessment. There has been both coal-bed methane development within the Atlantic Rim EIS area and natural gas development within the Continental Divide/Wamsutter II EIS area. This development and associated activity creates additional impacts on wildlife movement during heavy snow years as well (Standard 4 – Page 2 photo). There have been issues related to general and individual antelope, elk, and mule deer herd units from the natural gas and coal-bed methane development, which are identified below:

(1) *Baggs Antelope Herd Unit*: Coal-bed methane development is occurring in the area from Atlantic Rim just south of Rawlins to Muddy Mountain just north of Baggs and Dixon, Wyoming. Full field development is 2,000 wells. In addition to the wells, ancillary facilities include compressor stations, service roads, and pipelines, which may affect antelope. Although the majority of the development would occur outside crucial winter ranges, these adjoining lands and transitional ranges, are very important in supporting animal use and taking pressure off of the crucial winter range.

(2) *Bitter Creek Antelope Herd Unit*: Deep gas well drilling continues to expand throughout the herd unit. In the Echo Springs area the spacing of gas wells is decreasing from 160 acre spacing down to 80 acre spacing, with increased disturbance due to roads, pads, pipelines and other ancillary facilities. Seismic projects are also occurring within the herd unit. These projects reduce habitat availability and cause temporary displacement of animals and may create disturbance within the herd unit. The road networks also increase the use of the area by recreationists and other people. Gas field development has led to additional water sources being created, which change the distribution and seasonal use patterns of antelope in the area.

(3) *South Ferris Antelope Herd Unit*: The CBM development, on private lands on west side of Seminoe Reservoir, affect antelope through the loss of habitat due to road, well pad, facility, and pipeline construction in the eastern portion of the herd unit. Full development of methane wells along the coal beds could have serious impacts to crucial winter ranges resulting from both habitat loss and disturbance; however, at this time there are no active wells occurring on BLM-Administered lands. If development does occur, it should be noted

that AUMs would be removed for both wildlife and livestock, which could result in additional inter-specific competition.

(4) *Red Desert Antelope Herd Unit*: Previous surveys found large numbers of antelope north of traditional winter range in Area 60, and it may be necessary to modify the crucial winter range boundaries in the area. Habitat losses have occurred due to oil and gas development. Increased drilling and development of hundreds of natural gas wells in the southwestern third of the herd unit could impact crucial winter range. Major portions of the southern part of the herd unit are underlain by coal seams that have the potential to be developed for coalbed methane. A proposal to haul ore from an underground uranium mine on the south side of Green Mountain to the inactive Union 76 mill would have a minor effect on antelope summer habitat, but could negatively affect antelope migrations if not properly mitigated.

(5) *Shamrock Elk Herd Unit*: Conventional natural gas development has occurred for many years on the west side of the herd unit, and is expanding around Wamsutter and east to the Continental Divide. Elk have been using the undeveloped Five-mile Draw area, but development is occurring here as well. Elk use areas with lower road density and human activity, and rapid increases in road densities are reducing the size of elk security areas. Elk may permanently migrate west out of the area. Although coal-bed methane development has not occurred in the area, there are shallow coal seams that underlie much of the elk habitat.

(6) *Sierra Madre Elk Herd Unit*: Coal-bed methane is in the initial stages of development on the west side of Atlantic Rim. Compressor stations, service roads, and pipelines associated with the development would increase access and may create disturbances to wildlife. Elk, of all of the big game species, have the lowest tolerance for disturbance, and studies show elk tend to stay a mile or more away from roads with frequent human activity. The level of disturbance to elk will depend on the number of wells developed, their locations, and associated roads. Winter and transitional ranges may be affected, since most of this area was inaccessible due to drifting snow in the past. The west side of the herd unit, along Highway 789, is also experiencing increased natural gas development. The roads associated with the development increase the human presence in these areas, both by the commercial industry and by recreationists throughout the year.

(7) *Ferris Mule Deer Herd Unit*: Most of the coal-bed methane wells currently being proposed along the Coal Creek drainage lie outside of crucial winter habitats for mule deer but these same coal seams extend under winter range resulting in future impacts to the herd. There is the potential for future coal-bed methane development to occur in the area. Increased traffic and construction of pipelines to transport methane may also have an effect on crucial winter ranges along the North Platte River.

(8) *Baggs Mule Deer Herd Unit*: Coal-bed methane development is already described for this area under the Baggs Antelope Herd Area and the Sierra Madre Elk Herd Area. Mule deer are probably somewhere between antelope and elk in terms of their tolerance for disturbance.

Questions: (1) How does coal-bed methane, natural gas, and oil development effect big game transitional ranges and what long-term indirect affects will occur to big game crucial winter range? What are the impacts from coal-bed methane, natural gas, and oil development and associated roads,

pipelines, and reserve pits? What are the cumulative impacts to big game as a result of the expanding development within herd units and will these effects decrease after full field development occurs? What mitigation measures can be implemented to reduce the effects of coal-bed methane, natural gas, and oil development to big game herds?

Vegetation management is designed to achieve and maintain proper ecosystem function. Treatments include the use of management prescriptions, such as prescribed natural fires; burning; plantings; seedings; chemical, mechanical, biological, and grazing treatments; and the control of noxious and invasive species. There have been issues related to general and individual antelope, elk, and mule deer herd units from vegetation management on BLM-Administered lands, which are identified below:

(1) *Antelope Herd Units*: In the Baggs Antelope Herd Unit, there has been approximately 6,000-7,000 acres of prescribed burns that were conducted in the 90's in the Fillmore allotment and 2,200 acres of chemical (tebuthiuron) thinning of sagebrush as well. Many of these treatments have returned to a sagebrush dominated community. There is one additional prescribed burn identified in this allotment to target mountain shrub and aspen communities. The principle plant communities affected by prescribed burns have been mature to decadent stands of basin big sagebrush, and mountain big sagebrush, aspen and mountain shrub communities. Chemical treatments are directed primarily at stands of mountain big sagebrush, which have lower fuels to support burning. These chemical treatments are conducted to reduce the effect upon Greater Sage-Grouse by thinning rather than removing all of the sagebrush. A 10 year cooperative research study between the BLM and the WGFD the nearby Grizzly allotment was completed that compared the impacts of both prescribed burning and chemical applications to sagebrush communities and the wildlife that use them. Shrub treatments have been monitored to document changes to habitat conditions and the resulting effects on antelope and other wildlife species.

(2) *Elk Herd Units*: In several of the elk herd management areas, there have been concerns over the reduced health and productivity of forest and shrublands due to the lack of natural fires. Specifically within the Ferris Elk Herd Unit, the health of shrub and woodland communities on the Ferris and Seminoe Mountains is a key issue affecting the Ferris Elk Herd. Due to wildfire suppression and the lack of prescribed burns, there is increasing decadence, disease, insect infestations, and dominance by late successional species in these communities. These communities provide important cover, as well as forage for elk and a large wildfire could have serious effects upon the elk herd. Change is needed to provide elk and other wildlife with the necessary diverse and productive habitats to support them. A plan to address these issues has been "in the works" for the past 10 years, but is still not completed. In 2011 and 2012, there were two natural, lightening caused, fires that occurred in the Ferris Mountains that will improve elk habitat in the long term.

(3) *Mule Deer Herd Units*: Specifically within the Ferris Mule Deer Herd Unit, the species composition and decadence of the forest and shrub communities on and around the Ferris and Seminoe Mountains are the principle management issues.

(4) *Bighorn Sheep Herd Units*: The main issues affecting bighorn sheep are poor forage quality and lack of open habitat throughout their range. This is a result of natural forest succession, conifer encroachment into open spaces, and the suppression of wildfires. Continued insufficient high quality forage, competition for forage with elk, and predation are believed to be the principle factors affecting lamb survival. Another issue is the potential for disease transmission between domestic and wild sheep, and although the conversion of the Stone

Ranch livestock operation from sheep to cattle eliminated the chance for this to occur within the herd unit boundary, sheep use still authorized in the Whiskey Peak allotment by the LFO on the west border continues to pose health risks to the herd. Fences do cause some problems to bighorn sheep and water availability next to summer forage areas continues to be a concern.

Questions: What are the cumulative impacts to big game species as a result of implementing vegetative treatments, in addition to coal-bed methane, natural gas, and oil development in the watershed? What steps need to be taken and what support is needed in order to restore healthy and diverse shrub and woodland communities in big game herd units? In using fire or other types of vegetative treatments to alter big game herd unit conditions, what mixes of species and habitats would most benefit big game species?

Wild horse management is designed to protect, maintain, and control viable, healthy herds of wild horses while retaining their free-roaming nature; providing adequate habitat for wild horses while maintaining multiple-use relationships and thriving natural ecological balances; and providing opportunities for public viewing. Management requires the BLM to preserve and maintain the existing genotypes of the horses as well. There have been issues related to general and individual antelope, elk, and mule deer herd units from a wild horse management perspective on BLM-Administered lands which are identified below:

(1) *Antelope Herd Units*: In the Red Desert Antelope Herd Unit, there is some concern with the wild horse management, including population levels, their impact on riparian habitat, and indirect competition between wild horses and antelope. Prior to 2006, wild horse populations had been two to three times higher than the AML. The principle concern has been with the wild horse use and competition around scarce water sources and the condition of riparian habitat and wetlands that are important in supporting antelope does and fawns.

Questions: Will wild horse populations be maintained at the AML? Are AML numbers of wild horses correct in order to manage in conjunction with wildlife, livestock use, and other resource values? What management changes should be made to reduce existing conflicts between antelope and wild horses?

Private land development is continuing to occur since the development of the previous analysis. There have been issues related to general and individual antelope, elk, and mule deer herd units from private land development on BLM-Administered lands, which are identified below:

(1) *Antelope Herd Units*: In the Red Desert Antelope Herd Unit, more than 100,000 acres of private land in the checkerboard area north and west of Rawlins have been sold in 40 acre tracts, primarily to out of state owners who want to “own a piece of the West”. Although development of these lands is slow, portions of crucial winter range are being affected as buildings and fences are constructed, access to water is changed, and domestic animals and pets are brought in to native environments. Increased development of these lands, particularly as more fencing is constructed, could seriously degrade the quality and utility of antelope crucial winter range, and could impact migration corridors. Carbon County does have a land use plan, which promotes maintaining open range and habitat for wildlife. Unfortunately, the other neighboring counties have no similar plans and private property rights create a real dilemma for public land managers in these checkerboard areas.

(2) *Elk Herd Units*: The effects of development on private lands to elk are similar to those described for antelope. The Shamrock Elk Herd Unit overlaps the portion of the Red Desert

Antelope Herd Unit where development of private lands within the checkerboard area is increasing. Results will likely include an increase in density of roads, buildings, fences and human activity.

(3) *Mule Deer Herd Units*: The effects of development on private lands to mule deer are similar to those described for antelope. In the Chain Lakes Mule Deer Herd Unit, the majority of mule deer inhabit the more rugged country along the Rawlins Uplift and Lost Soldier Rim. The principle impacts to these areas would be the development of private lands in the checkerboard area and recreational use, although at this time there are currently no large scale impacts occurring. No crucial habitats have been identified for the this herd unit, since observations have been sporadic due to the small herd size.

Questions: What will future impacts be to big game species as development on private lands occurs? What values will the intermingled sections of public lands still retain as wildlife habitat? How much further will development occur in to the future and what types of mitigation, if any, will be effective and pursued? Could land exchanges or other methods be supported to block up private lands for development in order to maintain open spaces on public lands and protect crucial wildlife habitats? What type of educational programs could be implemented for private landowners to reduce impacts to big game species as private lands are developed?

Lichen poisoning in the Sierra Madre elk herd and possibly other units have become a problem within the last ten years (Standard #4 – Page 2 photo). In early 2004, it was presumed that over 500 elk died on or near the Daley WHMA from consuming Xanthoparmelia chlorochloa(vagrant lichen). The elk were unable to move, and were passing red urine. Although studies are ongoing at the University of Wyoming Vet Lab as to the toxicity of this lichen to elk, no concrete results have been identified. Animals (including domestic sheep) have been fed the lichen from 2004 from the Daley unit as well as other sites across the state, but none were as toxic as those lichens on the Daley during that year. Since that time, there were an additional 80 head of elk that were identified as being poisoned from lichen in the same area. Other sampling sites across the state did not result in the same level of lichen toxicity. More recently, there was an elk identified north of Interstate 80 west of Creston Junction (in the Shamrock Elk Herd Unit) that displayed the effects of lichen toxicity.

Sierra Madre Elk Herd Unit: Winter forage studies have not demonstrated any lack of herbaceous forage for the wintering elk during any of the dieoffs. The BLM and WGFD have instituted a clipping study to ensure adequate herbaceous forage is left for this herd unit. However, elk have not historically used this area and it is not known if that is a contributing factor. Current WGFD management includes hazing the elk south to their traditional winter range and increasing hunter pressure for longer periods of time. Higher numbers of elk using this area may also be a contributing factor as well. Winter conditions may play a crucial role in whether lichen becomes toxic to these animals, however, more research must be done. In 2010, due to possible crucial winter range limitations elk within the Sierra Madre Elk Herd Unit came all the way to Rawlins due to extreme winter conditions.

Questions: Have we exceeded our carrying capacity for the Sierra Madre Elk Herd Unit and has that caused the animals to range outside crucial winter range and resulted in dieoffs? What role does lichen play in winter habitat for elk?

Poor *forage quality and lack of open habitat* for species, specifically for bighorn sheep, is continuing to occur since the development of the previous analysis. There have been issues related to individual antelope, elk, and mule deer herd units due to forage quality on BLM-Administered lands; however, one

of the main issues concerns bighorn sheep habitat within the Ferris and Seminoe Mountains is identified below:

Ferris-Seminoe Bighorn Sheep Herd Unit: The main issues affecting bighorn sheep are poor forage quality and lack of open habitat throughout their range. This is a result of natural forest succession, conifer encroachment into open spaces, and the suppression of wildfires. Studies conducted on Ferris Mountain have shown that ewes give birth to healthy lambs, but survival of these lambs beyond July is very low. Insufficient high quality forage, competition for forage with elk, and predation are believed to be the principle factors affecting lamb survival. Another issue is the potential for disease transmission between domestic and wild sheep. The conversion of the Stone Ranch livestock operation from sheep to cattle eliminated the chance of this occurring within the herd unit boundary. However, sheep use still authorized in the Whiskey Peak allotment by the LFO on the west border continues to pose a health risk to the herd. Fences do cause some problems to bighorn sheep and there have been some deaths, specifically to rams, as a result of fences. Water availability next to summer forage areas is also a concern.

Questions: What type of schedule will authorized actions follow to improve habitat for bighorn sheep? Will funding be available for these actions?

Raptors

Raptors are primarily affected by prey availability, specifically related to the abundance of their prey species, which fluctuates annually as a result of habitat and climate conditions. Additional factors influencing habitat conditions and availability include impacts associated with livestock management practices (condition of habitat for food base); oil, natural gas, and coal-bed methane development; vegetation treatments; private land development (sub-division development), and recreation activities (falconry practices).

Questions: What types of impacts are affecting raptors and what types of mitigation can be implemented to reduce and or eliminate these impacts?

Threatened, Endangered, Proposed, and Candidate Species:

The issues are closely associated with the health and diversity of habitat types. In general, the healthier an ecosystem is, the more T&E species tend to thrive and do better.

Black-Footed Ferret

The only issue concerning black-footed ferrets would be potential impacts to white-tailed prairie dog towns, the major food base and habitat for the black-footed ferret, which may occur as a result of oil, natural gas, and coal-bed methane development; recreation activities; and private land development (subdivision development) and the effects these impacts would have on the black-footed ferret. In general, livestock management should not impact potential black-footed ferret habitat.

Questions: Where are impacts to white-tailed prairie dog towns occurring? What effects has plague had on prairie dog populations?

Canada Lynx

There should not be any management issues with the Canada lynx since this species only use the riparian habitats between ranges during dispersal and it would be unlikely that this species would be traveling through the watershed, although this may occur. There should not be any impacts to this species as a result of implementing actions within the watershed.

Greater Sage-Grouse

Approximately 133 Greater Sage-Grouse leks and their associated nesting habitat occur within the watershed. Habitat changes within portions of the watershed have occurred, specifically resulting from drought within the past several years. Drought reduces the amount and height of vegetative cover, which may lead to lower nesting success and chick survival for the following year. Drought also affects production of understory forbs, which could have negative impacts to early brood-rearing, specifically from April through June (critical time period). Water sources placed in the uplands may increase cattle use in areas that grouse use for nesting which can affect grouse nesting success and survival of chicks. Wild horse population numbers could increase without continual proper management. If wild horse numbers increase, forage use in uplands would increase as well, further impacting grouse habitat. Wild horse and livestock use of limited riparian areas has been restricted or managed to benefit overall health of these important habitats. Oil, natural gas, and coal-bed methane development activities continue to expand and although seasonal stipulations on BLM-Administered lands provide some protection to grouse strutting activities, there are no protections on private or state lands during the strutting and nesting time periods. Habitat loss resulting from mineral development and subdivision activities continues (WGFD 2002). Large scale sagebrush treatments may cause negative impacts if located in nesting habitat, but smaller scale sagebrush habitat conversions (less than 200 acres in size) may actually result in beneficial impacts to nesting grouse. In addition, tebuthiuron treatments have diversified habitats while still preserving the structure important to grouse. Fences constructed next to strutting grounds may cause negative impacts to grouse by becoming perches for raptors or obstructions to fly into.

Questions: What levels and seasons of use are appropriate for livestock and wild horses in upland and riparian habitats in conjunction with the needs of sage grouse and other wildlife? What are the cumulative impacts to Greater Sage-Grouse as a result of authorizing actions including coal-bed methane, natural gas, and oil development, livestock management and associated projects (water development, fences, habitat treatments), recreation activities, and the wild horse management program? What educational programs can BLM become involved in with private landowners to reduce and/or eliminate impacts to grouse within, and adjacent, to private parcels?

Blowout Penstemon Plant

There are not any current issues affecting the blowout penstemon plant species, since this species actually prefers disturbed areas. There should not be any impacts to this species as a result of implementing actions within the watershed.

Ute Ladies'-tresses Plant

The Ute ladies' tresses plant is located in riparian habitats. The plant may be impacted by livestock grazing; however, these impacts may not be irreversible. It is considered a "take" only if the entire plant, roots and all, are removed, and grazing does not remove the roots. If populations are found, additional steps in the analysis regarding current and future management practices would occur.

Questions: What locations are most likely to support this plant within the watershed?

North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, and Western Prairie Fringed Orchid

The North Platte River Threatened and Endangered species utilize habitats located in Nebraska along the North Platte River. Factors, which may affect these species, relate to water depletions in the North Platte River system as a result of implementing proposed projects. A proposed project that may result in water depletion, including evaporative losses, to the system triggers a "may affect" situation and requires a biological assessment to be prepared. Formal consultation with the USFWS is required.

Questions: How many projects within the watershed have been determined to cause water depletion to the North Platte River system since the last assessment was completed? Have these depletions had any effect on populations in Nebraska?

BLM State Sensitive Species:

Eight mammals, 13 birds, three amphibians, and four plants have been identified as BLM State Sensitive species and may occur, or have the potential to occur, within the watershed area. The main key issues include a lack of information concerning exact locations of most of these species and the affects that authorized actions may have on these species. Inventory and monitoring has occurred, and will continue to occur, throughout the watershed area for these species.

Questions: There are numerous questions concerning these species, including, but not limited to, what effects do fencing, livestock management practices, coal-bed methane, natural gas, and oil development, vegetation treatments (prescribed burns, chemical treatments), wild horse management, recreation activities, and private land developments have on these species? How much information should be obtained concerning specific species before land management actions are implemented?

Mammals

Long-eared myotis, fringed myotis, spotted bat, Townsend's big-eared bat: Very little is known about the migration and hibernation patterns of these bats species within the watershed; however, inventories are being conducted by BLM Biologists, as time permits within the watershed to continue to map these species. Livestock management practices, such as creating ponds and reservoirs, and vegetation treatments, which diversify habitats, will benefit bat species since these bats are all insectivores. The construction of fences; oil, natural gas, and coal-bed methane development; wild horse management; and private land development should not impact bat species. In general, there should not be any impacts to bat species as a result of implementing actions within the watershed.

Questions: Which species are foraging and breeding within the watershed? Are there any hibernaculums located within the watershed? If so, which species are using these during the winter months?

White-tailed prairie dog: There has been mapping of white-tailed prairie dogs within the watershed; however, most of this mapping occurred in the early 2000's and mapping for the entire watershed has not been completed to date. Oil, natural gas, and coal-bed methane development and vegetation treatments could affect white-tail prairie dogs; therefore, site specific analysis is required at the project level to determine which, if any, impacts will occur and identify mitigation measures to reduce these

impacts. Livestock management practices, the construction of fences; wild horse management; and private land development should not impact the white-tailed prairie dog. In general, there should not be any impacts to white-tailed prairie dogs as a result of implementing actions within the watershed.

Questions: Should a revised map of white-tailed prairie dog towns located within the watershed be a priority? How often should these maps be updated?

Wyoming pocket gopher and pygmy rabbit: The Wyoming Natural Diversity Data Base (WYNDD) and the BLM have been conducting inventories for both the Wyoming pocket gopher and the pygmy rabbit within portions of the watershed. Projects are analyzed at the site-specific level to determine if habitat exists for BLM Sensitive Species, such as these two species; therefore, oil, natural gas, and coal-bed methane development; vegetation treatments; livestock management practices, including the construction of fences; wild horse management; and private land development should not impact the Wyoming pocket gopher or pygmy rabbit. In general, site-specific analysis and the use of mitigation measures for proposed projects should reduce and/or eliminate any impacts to these two species as a result of implementing actions within the watershed.

Questions: The BLM should continue to inventory and map Wyoming pocket gopher and pygmy rabbit habitat within the watershed, but how should these species be prioritized in regards to other issues?

Swift fox: The species has the potential to occur within the watershed, but at this time locations of dens have not been mapped. Projects are analyzed at the site-specific level to determine if habitat exists for BLM Sensitive Species, such as the swift fox; therefore, oil, natural gas and coal-bed methane development; vegetation treatments; livestock management practices, the construction of fences; wild horse management; and private land development should not impact the swift fox. In general, site-specific analysis and the use of mitigation measures for proposed projects should reduce and/or eliminate any impacts to this species as a result of implementing actions within the watershed.

Birds

Loggerhead shrike, sage thrasher, Brewer's sparrow, sage sparrow, white-faced ibis, trumpeter swan, long-billed curlew: These species have the potential to occur in the watershed. Projects are analyzed at the site specific level; however, it should be noted that nests are difficult to locate at times, especially when the project analysis is completed outside of the breeding time periods. To the BLM Wildlife Biologists' best ability, specifically for neo-tropical migratory birds, the site-specific analysis and the use of mitigation measures for proposed projects should be implemented in order to reduce and/or eliminate any impacts to these species.

Questions: What areas of public lands are being used by these sensitive bird species, and if there is nesting activity, how successful is it? What types of impacts are attributable to oil, natural gas, and coal-bed methane development; vegetation treatments; livestock management practices, to include the construction of fences; wild horse management; and private land development, and what actions can be implemented to reduce and or eliminate resulting impacts?

Bald eagle: The only issue relating to bald eagles in the watershed center around the health of riparian vegetation, specifically the health and vigor of cottonwood trees along the North Platte River system. Livestock may affect tree health and vigor along the river system if there are excessive rubbing and browsing resulting in damage to young trees. Beaver will cut down cottonwood trees to eat and build dams with. Lack of high flow events, particularly in stretches of the river where flows are controlled through dam releases, reduces the regeneration of young cottonwood trees.

Questions: What areas of public lands are being used by bald eagles, and if there is nesting activity, how successful is it? What types of impacts are attributable to cattle and what actions can be implemented to reduce and or eliminate them?

Northern goshawk, ferruginous hawk, peregrine falcon, burrowing owl: These four raptor species have the potential to occur in the watershed. Projects are analyzed at the site specific level; however, it should be noted that nests are difficult to locate at times, especially when the project analysis is completed outside of the breeding time periods. To the BLM Wildlife Biologists' best ability, specifically for raptor species, the site-specific analysis and the use of mitigation measures for proposed projects should be implemented in order to reduce and/or eliminate any impacts to these species.

Questions: What areas of public lands are being used by these sensitive bird species, and if there is nesting activity, how successful is it? What types of impacts are attributable to oil, natural gas and coal-bed methane development; vegetation treatments; livestock management practices, including the construction of fences; wild horse management; and private land development and what actions can be implemented to reduce and or eliminate any impacts?

Mountain plover: There are not any major issues concerning mountain plovers within the watershed area. Mountain plover prefer short-grass eco-systems, where livestock grazing is actually advantageous for this species. Livestock have the potential to step on nests and/or eggs, but this would be by chance and plover may have double clutches.

Questions: Where are the known mountain plover occupied habitat areas located, what are the vegetative (or other) criteria that define habitat used by these birds, and what is the reproductive success of these birds using the area?

Plants

Cedar Rim thistle, p*ersistent sepal yellowcress, Laramie false sagebrush, and limber pine*: these plant species are generally resilient to surface disturbance and disruptive activities; however, if the seed sources are removed each year for consecutive years then negative impacts will occur. Specific issues relating to these four BLM Sensitive Plant Species vary across the watershed and include: livestock management practices (grazing and trampling); oil, natural gas, and coal-bed methane development (specifically when development occurs in the playas); vegetation treatments; wild horse management; private land development; and poor forage quality and access to habitat.

Surveys were conducted for Cedar Rim thistle throughout its known range in 2012 by the WYNDD. Verification of voucher specimens collected at that time has been determined to be *Cirsium pulcherrimun*. Based on the information, there is now a question as to whether or not the Cedar Rim thistle plant occurs in the RFO. Further analysis of species identification will continue by WYNDD and species experts.

Limber pine trees located on Ferris and Seminoe Mountains have several diseases, including the Mountain Pine Beetle infestations, Mistletoe and White Pine Blister Rust infections. In addition, the tree is sensitive to climatic changes that are continuing to occur. The species is undergoing a downward trend, such that species viability, or its distinct population segment, is at risk. There are inherent differences in managing geographically wide-spread tree species compared with the manner in which BLM traditionally manages Special Status Species. The locations of Wyoming BLM's five needle pine ecosystems provide an opportunity to manage these woodlands to restore or maintain them on the

landscape and still meet multiple resource objectives. Recently, ecologists have identified a suite of effective management strategies for maintaining and restoring these species to the landscape. The BLM IM: 2011-041, *Management Guidelines for White Bark and Limber Pine on the BLM Wyoming Sensitive Species*, provides direction to the BLM on how to manage limber pine found on BLM-Administered lands.

Questions: What specific types of impacts are attributable to management actions and what actions can be implemented to reduce and or eliminate impacts to these four sensitive plant species?

3) Current Conditions

The following describes current conditions of wildlife populations and their respective habitats located within the watershed, or having the potential to use habitats within the watershed.

Species of Interest or Concern:

Big Game Species: Antelope

Baggs Antelope Herd Unit: The Baggs Pronghorn Herd is slightly below the objective of 9,000 (set in 1993) and the continued WGFD management strategy is to increase herd size. The seasons will remain relatively conservative until the population allows for more liberal seasons. Throughout the Baggs herd unit energy development is increasing, in both traditional oil and gas developments, and in wind energy. The Sierra Madre-Chokecherry wind energy development will impact a portion of the herd's summer ranges, and will be the largest wind energy facility in North America. Landownership is varied throughout the herd unit. Hunt Area 53 remains relatively open to public hunting with a majority of the land under public ownership, but it appears energy development has displaced some animals. However, Hunt Area 55, which has less energy development, is under checkerboard ownership with the exception of the Daley WHMA and has public access concerns, with much of the private land leased to outfitters. Variable weather conditions and severe winters experienced in recent years seem to have slowed the recovery of the Baggs herd from declines resulting from the 2007-08 winter. Emigration during the 2007-08 winter (to the Bitter Creek herd), winter losses, and likely reduced habitat suitability have all decreased the ability of the herd to recover quickly, as experienced in the past.

Over the past several years the herd has experienced extreme weather conditions which has led to fluctuations in fawn and adult survival rates, fawn production, pronghorn distribution, and hunting conditions. In 2010-11 moisture levels were at record highs with significant snow levels, followed by 2011-12 with record drought conditions and minimal snow levels. Fawn production over the past four years has been high when compared to the preceding 10 year average, but tends to vary between the two hunt areas. Increased fawn production may have led to lower winter fawn survival following the extreme drought conditions, but this is somewhat speculative given limited field data to support this finding. Increased fawn production is contributing to herd growth, nearing the approved objective of 9,000. Fawn recruitment appears to be nearly normal over recent years, despite increased fawn ratios. Yearling ratios are comparable to average numbers prior to the 2007-08 winter, suggesting increased fawn production did not necessarily result in increased recruitment to the yearling age class. The current population model estimates the 2013 end-of-bio-year population to be 8,600 pronghorn, slightly below the current objective, which may be below hunter expectations. In the past, it was not uncommon for the population to greatly exceed the established objective, and sportsmen tend to favor this condition. The fact that numbers are not meeting demand is consistent with personnel, sportsmen, and landowner observations. The winter of 2007-08 was devastating to the herd, but numbers are increasing, albeit slower than previous periods of winter loss. Habitat issues may be slowing recovery through lower

potential carrying capacity and increased mortality due to winter events and drought. The 2013 hunting seasons for the herd unit will allow the population to continue to increase (WGFD, 2013).

Bitter Creek Antelope Herd Unit: The Bitter Creek herd is below the objective of 25,000 (set in 1993), and conservative seasons will be continued to allow for maximum population growth. The Bitter Creek pronghorn herd continues to face many challenges through the expansion of the CD-C and Desolation Flats gas fields and competition with the large numbers of wild horses on the landscape. Currently there are approximately 9,000 wells in the CD-C, with a proposal to increase this number by an additional 8,950 infill wells. The majority of these wells occur on summer ranges and across migration routes for the Bitter Creek herd. New developments have begun to occur in relation to the Desolation Flats development, most notably along the Bitter Creek Road and the Willow Creek Rim area. Plans are being implemented to create a new large pipeline to connect two (2) new compressor stations that will be placed on and near Willow Creek Rim, some of the better pronghorn habitat in the herd unit. The number of proposals to work year-round on both of these sites has increased recently. Despite recent gathers of wild horses within the boundaries of the Bitter Creek herd, the number of horses is still alarming due to the low productivity in the area, and are at a level that is probably having an impact on pronghorn. The recent court decision regarding the Rock Springs Grazing Association lawsuit brought against the BLM may alleviate some competition from horses in the area. However, increasing landscape level impacts, and continued long-term drought, are proving to be a challenge for the pronghorn in the Bitter Creek herd unit.

Within the past several years extreme weather conditions, especially winter weather events and extreme drought, have resulted in very poor fawn production and survival for the herd unit, some of the lowest in Wyoming. In 2010-11 moisture levels were at record highs with high snow levels and followed in 2011-12 with record extreme drought conditions and minimal snow. The Bitter Creek herd declined significantly during the 2007-08 winter and has been making a very slow recovery since. The past four years have seen an average total population of less than 9,000. Low productivity has played a primary role in the inability of the population to increase. Additionally, severe winter and extreme drought conditions are hampering population growth despite very conservative seasons. High variability in fawn production and buck ratios between hunt areas 57 and 58 are also problematic for the herd. Fawn productivity has been low in the herd unit for a number of years due to increasing impacts, and numbers have been significantly lower than former levels from the early 1990s. The proposed 2013 seasons will allow for continued maximum population growth. The WGFD harvest strategy should lead to the largest growth potential for the herd, barring major impacts from landscape level challenges. However, it should be recognized that the potential for the area to support higher pronghorn numbers is greatly impacted by the long list of current and developing issues (WGFD, 2013).

Red Desert Antelope Herd Unit: The Red Desert pronghorn herd is managed toward a post-hunt population of 15,000, an objective last publicly reviewed in 1994. The herd is in special management, with harvest quotas designed to maintain pre-hunt buck to doe ratios above 60:100. Historically, access in the herd unit has been good. Much of the unit is public land, and hunters have been able to acquire access to most private lands in the checkerboard. The seasonal distribution map for the herd has not been updated for many years, and it is likely there are crucial winter habitats, particularly in Area 60, that have not yet been delineated. Habitat issues in the herd unit include continued gas field development, coal-bed natural gas development, opening of an in-situ uranium mine, along with other mines being proposed and the possible development of shale oil. Many miles of sheep-tight fences exist in the herd unit, impeding pronghorn movements and migrations, and increasing losses during severe winters.

Drought conditions were extreme in 2012 and were classified as moderate in April, severe in May, and then extreme through February 2013. As a consequence, fawn production was exceptionally low at 42:100, the lowest ever recorded for the herd. Body condition of most pronghorn harvested from these three areas in 2012 was poor, especially for lactating does. Given the poor condition of animals at the end of fall, mortality is expected to be above average during the 2012-13 winter, despite moderate winter conditions. While no WGFD herbaceous habitat transects are established within the herd unit, herbaceous forage production is expected to have been minimal due to record drought. BP America transferred ownership of two solar water wells on Chain Lakes WHMA to WGFD. Once developed, these wells will provide additional water sources for wildlife and help disperse domestic livestock that graze the Chain Lakes WHMA. It appears more likely the extreme drought conditions caused a significant number of pronghorn to move out of Areas 60 and 61 into the more mesic habitats of Area 64, as was previously documented with telemetered pronghorn during the 1980s. The herd was well below objective size following a record harvest and severe winter losses in 1992. Conservative harvests after that winter, combined with improved fawn production and survival beginning in 2007, allowed the herd to reach and be maintained at objective size in 2010 and 2011. Population estimates suggested the herd was slightly above objective size and harvest, particularly for does and fawns, was increased in 2012 to its highest level since 1992. According to the spreadsheet model, the combination of heavy harvest and extremely poor fawn production in 2012 significantly reduced herd size, which was estimated at just over 11,000. With the population estimated to be 26 percent below objective, harvests need to be reduced to allow the herd to recover (WGFD, 2013).

South Ferris Antelope Herd Unit: The South Ferris pronghorn herd is managed toward a post-hunt population of 6,500, an objective last reviewed in 1994. Hunter access to much of the eastern half of the herd has been severely limited by private landowners since the mid-1990s. This herd was at objective size at the end of the 1990s but declined in 2001 and has remained roughly 15-20 percent below objective ever since, largely a result of poor fawn production. Fawn crops only ranged from 28 to 55:100 over the past 12 years, averaging 40:100. Poor production and recruitment has prevented the herd from recovering towards objective.

Drought conditions were extreme in 2012, with minimal snowfall during the 2011-12 winter and almost no precipitation throughout the spring and summer. Body condition of most pronghorn harvested from the area in 2012 was poor, especially for lactating does, and given the poor condition of animals at the end of fall, mortality was expected to be above average during the 2012-13 winter, despite moderate winter conditions. Three late winter blizzards in April 2013 likely increased winter losses. While no WGFD herbaceous habitat transects are established within the herd unit, herbaceous forage production is expected to have been minimal due to record drought. Only one shrub transect has been established near the herd unit, on the Morgan Creek WHMA. Monitoring of the transect showed bitterbrush growth and utilization in the Seminoe Mountains, but was burned in the 2012 fires. New owners of the Pathfinder Ranch, which encompasses the north-central portion of the herd, have expressed interest in looking for opportunities to improve habitat conditions for wildlife, possibly as mitigation for wind power projects in other parts of the state. Habitat issues that would benefit pronghorn include treatment of winter ranges, adjustments to grazing usage, and modifications to sheep-tight fences. With the population apparently well below objective, harvests need to be reduced to allow the herd to recover, particularly in the western half. High numbers of pronghorn on irrigated croplands in the northwestern corner have been a perpetual complaint, which was aggravated by drought conditions in 2012. If either winter survival or fawn production exceeds expectations in 2013, the increase would be improved, but this herd is unlikely to reach objective size for several years without significant improvements to fawn production and survival (WGFD, 2013).

North Ferris Antelope Herd Unit: Historically, access has not been an issue in the herd unit, which is mostly public lands, but access to some blocks of private land has become more difficult in recent years and may affect management ability to attain adequate harvests in the future. Potential for economic wind power exists within the herd unit, but appears unlikely when other resource issues such as T&E species and Greater Sage-Grouse Core are considered. Many miles of sheep-tight fences still stand in the herd unit, impeding pronghorn movements.

Drought conditions were extreme in 2012, with the drought being classified as moderate in April, severe in May and then extreme for all subsequent months through February 2013. As a consequence, fawn production was quite low, at 39:100, the lowest ratio in 19 years. The combination of continued heavy doe/fawn harvest and extremely poor fawn production in 2012 has significantly reduced herd size this year, estimated at just over 3,300. This is the lowest this herd has been in at least 20 years. Herbaceous forage production is expected to have been minimal due to record drought. Two shrub transects have been established within the herd unit, primarily to monitor mule deer winter forage. One of these, on the Morgan Creek WHMA, was burned in the 2012 fires and the second was not monitored in 2012. New owners of the Pathfinder Ranch, which encompasses the north-central portion of the herd, have expressed interest in looking for opportunities to improve habitat conditions for wildlife, possibly as mitigation for wind power projects in other parts of the state. Habitat issues that would benefit pronghorn include treatment of winter ranges, adjustments to grazing usage, and modifications to sheep-tight fences.

The herd was below objective size for most of the decade following the 1992-93 winter, occasionally by as much as 20 percent or more, a consequence of low fawn production and poor recruitment. High fawn production followed by an unusually mild winter in 2004 provided the first significant growth in herd size. Population estimates suggested the herd was well above objective size from 2006 until 2012, and harvests were increased accordingly. The 2012 spreadsheet model showed a similar growth above objective in 2006, but predicts that increased harvests successfully reduced the herd to within 10 percent of objective by 2010 and slightly below objective following the 2011 hunt.

Due to the poor condition of animals going into this winter and projections of continued drought in 2013, fawn production in 2013 was projected to be similar to that seen in 2012. With the population estimated to be 33 percent below objective, harvests need to be reduced to allow the herd to recover (WGFD, 2013).

Big Game Species: Elk

Ferris Elk Herd Unit: The management objective for the Ferris Elk Herd Unit is a post-season population objective of 350 elk. The management strategy is “special” management, with bull:cow ratios allowed to exceed 30:100, and the proportion of branch-antlered bulls expected to exceed 66 percent of the antlered harvest. The population objective and management strategy were last publicly reviewed in 1994. All affected major landowners strongly endorsed keeping the population objective at 350. Access is a major issue with the herd unit. While there are large blocks of accessible, public land, refugia created by several large ranches have either been closed to hunting or greatly limited hunter numbers, thereby denying hunters access to most of the elk in the herd unit.

Drought continued in 2012, with almost no precipitation through the spring and summer. Elk in these low elevation mountains have few options for finding green forage during dry conditions, with no high elevation alpine or mountain meadow habitats available. Body condition of most harvested elk was poor. While there are no WGFD herbaceous habitat transects established within the herd unit, herbaceous forage production is expected to have been minimal due to record drought. Two browse

transects have been established in the herd unit, but one was burned by fire in 2012 and the other was not monitored. Over the past several years the RFO has implemented prescribed burns in the Seminoe and Ferris Mountains, partly to address conifer encroachment, while also rejuvenating decadent mountain mahogany and bitterbrush stands. In the summer of 2012, two large wildfires in the Seminoe Mountains and the eastern Ferris Mountains burned thousands of acres. These prescribed burns and the recent wildfires should benefit elk. The Seminoe Fire burned over 3,800 acres in the Seminoe Mountains, including areas within Morgan Creek WHMA. The RFO coordinated and funded aerial application of Plateau® to mitigate cheatgrass spread on BLM and WGFD managed areas within the fire perimeter. The wildfire enveloped several previously planned prescribed burns, although not with the desired prescriptions. Increased harvests over the past three years explains the dramatic drop in trend counts and suggests this herd is currently at or near objective size (WGFD, 2013).

Shamrock Elk Herd Unit: The management objective for the Shamrock Elk Herd Unit is only 75 elk. The management strategy is recreational management and this objective and management strategy were first established in 1984, when elk were found almost exclusively in the southern quarter of the herd unit, and was last publicly reviewed in 1994. The herd consists of bands of elk scattered in open sagebrush desert with three main areas of concentration in the southeast, southwest, and the northeast corners of the herd unit. Observations have documented movement of bands of elk between these three concentration areas, as well as other herd units to the west and north, leading to confusion on the actual numbers of elk in the population. Aerial trend counts have been attempted, but often failed to find elk in all three areas simultaneously. Classification samples have been too small and inconsistent to allow for a reliable herd model to guide management.

Drought continued in 2012, with almost no precipitation through spring and summer. Elk in this desert herd unit have few options for finding green forage during dry conditions, with no high elevation habitats available. These bands of elk are highly mobile, and observations before and during the 2012 hunt suggest a significant number of elk from the southwestern portion of the herd may have moved west into more mesic habitats in Area 100. Body condition of the few harvested elk was poor. A cow elk found dying of lichen toxicity, just a few miles west of the herd in Area 100, in September suggests range conditions were poor enough in this part of the Red Desert to induce elk to feed on toxic forage. Calf production was low in some neighboring herds due to drought conditions in 2012 and production is presumed to have been low in this desert herd as well. While there are no WGFD herbaceous habitat transects established within the herd unit, herbaceous forage production is expected to be minimal due to record drought. Only one shrub transect has been established near the herd unit, on the Chain Lakes WHMA, but was not monitored in 2012. BP America transferred ownership of two solar water wells on Chain Lakes WHMA to WGFD and once developed, these wells will provide additional water sources for wildlife and helped disperse domestic livestock that graze Chain Lakes WHMA. The population objective of 75 elk adopted for the herd unit in 1984 may have been appropriate when elk were only resident in the checkerboard, primarily in the southeast corner near Rawlins. However, increased elk numbers in habitats shared with Area 100 to the west and expansion of 222, the population into mostly public lands north of the Mineral X Road, it may be reasonable to consider a different objective. In order to address concerns over elk use on private lands, a commitment to restrain elk numbers within the checkerboard may be beneficial. Realigning herd unit and hunt area boundaries with neighboring herds to the west and north may also improve management of elk in the area.

Sierra Madre Elk Herd Unit: The Sierra Madre elk herd (SMEH) is significantly above the objective of 4,200 (set in 1978), and the WGFD's current management strategy is to decrease herd size through a significant amount of antlerless harvest. As stated earlier this elk herd unit has pioneered additional crucial winter ranges, while suffering lichen poisoning in 2004 and 2008. Despite increased pressure from the Atlantic Rim gas field the SMEH continues to be productive and has not shown negative

impacts from increased oil and gas development activities in the herd unit. Elk have likely moved in response to development and may be occupying mule deer winter range to a greater degree. The large Choke Cherry-Sierra Madre wind project may have a larger impact when constructed on the elk population because the project may directly impact both wintering elk and migrating elk. Another landscape level impact to the SMEH will be the progression of beetle kill through the Sierra Madre range, although this may yield positive effects. Currently, trees have begun to fall at alarming rates, which may lead to disruption in traditional movement patterns. The weather conditions have been quite variable over the past several years. In 2010-11 moisture levels were at record highs with substantial snow levels and followed in 2011-12 with record drought conditions and minimal snow levels. The SMEH has traditionally been a very productive herd and, until recently, has shown constant, steady growth. Harvest success, hunter success, model estimates, and the total number of elk classified all suggest the elk population remains above the current objective (WGFD, 2013).

Big Game Species: Mule Deer

Ferris Mule Deer Herd Unit: The management objective for the Ferris Mule Deer Herd Unit is 5,000 mule deer. The current management strategy is recreational management, but the herd is undergoing review to change the management status to "special." The objective and management strategy were last publicly reviewed in 1994. The 2012 post-season population estimate was about 2,025, with the population trending slowly downward from a high of about 3,000 deer in 2003. The herd was last near objective size prior to the 1992-93 winter. Restricted hunting access to major blocks of private and checker-board lands has concentrated hunting pressure on the remaining portions of the area, making it difficult to manage buck numbers and quality in the remaining portions of the herd.

Losses were above normal during the 2010-11 winter because of a pre-Christmas snowstorm that laid a blanket of hard, crusted snow across most winter ranges that did not melt until the second half of February, followed by cold, wet storms during early spring. This was followed by drought conditions in 2012, with almost no precipitation throughout the spring and summer. Given the poor condition of animals at the end of fall, mortality is expected to be above average during the 2012-13 winter, particularly following three severe winter storms in April. Lack of fires have resulted in decadent shrub stands encroached by conifer in the herd unit. Severe drought has reduced the quantity and quality of forage for mule deer. Two browse transects have been established in the herd unit, but one was burned by fire in 2012 and the other was not monitored. Over the past several years the RFO has implemented prescribed burns in the Seminoe and Ferris Mountains, partly to address conifer encroachment, while also rejuvenating decadent mountain mahogany and bitterbrush stands. In the summer of 2012, two large wildfires in the Seminoe Mountains and the eastern Ferris Mountains burned thousands of acres, including crucial mule deer winter habitat, as well as year round habitats. These prescribed burns and the recent wildfires should ultimately benefit mule deer productivity in the long term with the return of young vigorous shrub complexes. The Seminoe Fire burned over 3,800 acres in the Seminoe Mountains, including areas within Morgan Creek WHMA. The RFO coordinated and funded aerial application of Plateau® to mitigate cheatgrass spread on BLM and WGFD managed areas within the fire perimeter. The wildfire enveloped several previously planned prescribed burns, although not with the desired prescriptions. Through their expectations and demand, hunters, landowners and outfitters have placed the area into de facto special management and a proposal by the WGFD to recognize this public demand and change management status of the herd to "special" is planned for 2013 (WGFD, 2013)

Chain Lakes Mule Deer Herd Unit: The management objective for the Chain Lakes Mule Deer Herd Unit is 500 deer and the management strategy is recreational management. The objective was last reviewed in 1994. Concerns have arisen that improved range, accuracy, and faster reloading times of modern in-line muzzle-loading firearms has increased hunter success, rather than increases in deer numbers.

Based upon data recorded in herds to the north and south, losses were presumed to be above normal during the 2010-11 winter because of a pre-Christmas snowstorm that laid a blanket of hard, crusted snow across most winter ranges that did not melt until the second half of February, followed by cold, wet storms during spring. This was followed by drought conditions in 2012, with almost no precipitation throughout the spring and summer. While there are no herbaceous habitat transects established within the herd unit, herbaceous forage production is expected to be minimal due to record drought. Only one shrub transect has been established near the herd unit, on the Chain Lakes WHMA, but was not monitored in 2012. BP America transferred ownership of two solar water wells on Chain Lakes WHMA to WGFD. Once developed, these wells will provide additional water sources for wildlife and help disperse domestic livestock that graze Chain Lakes WHMA. The herd consists of small bands of deer residing yearlong in pockets of suitable habitat in the eastern Red Desert. No reliable population estimate is available for the herd, nor is one likely under current manpower and budget constraints. Deer in this desert herd unit have few options for finding green forage during dry conditions, with no high elevation habitats available. Body condition of the few deer harvested checked was poor (WGFD. 2013).

Baggs Mule Deer Herd Unit: The Baggs mule deer herd is below the objective of 18,700 (which was established in 1986) and the WGFD's current management strategy is to increase herd size.
Oil and gas development associated with the Atlantic Rim Project continues to impact deer populations, and impacts are increasing as the size of the development increases. Additionally, within two years, the WGFD expects to see the development of the largest wind energy project in North America, the Chokecherry-Sierra Madre Wind Project. A study, that was recently published, clearly outlines negative impacts are a result of increased oil and gas development activities on migrating mule deer within the Baggs herd unit. The study found that mule deer migrated quicker through areas with high levels of development and spend less time in stop over sites. In addition to the Atlantic Rim project, many parcels of public land on the west side of the Sierra Madre mountain range have been leased for oil and gas development, as has the bulk of this population's winter ranges. Energy developments and proposals in the herd unit range from traditional oil and gas developments to coal-bed methane, in-situ uranium, and wind energy developments. In addition, elk and feral horse use of winter range habitats is increasing, potentially to the detriment of the species.

Within the past several years, extreme weather conditions have occurred within the herd unit. This has led to variations in fawn and adult survival, fawn production and hunting conditions. Significant variability in weather conditions and severe winters continue to impact the mule deer population. The winter of 2010-11 was the second most severe winter experienced in the herd unit in the past four years, followed by one of the driest on record (2011-12), which resulted in very difficult summer conditions for deer. Because of high moisture levels during the summer/fall of 2011, most deer were in very good condition going into the winter of 2011-12, resulting in a very large fawn crop during the spring/summer of 2012, with most does producing twins. In a normal moisture year this would equate to a large population increase. However, the summer of 2012 was under an extreme drought designation, and does were unable to build both fat reserves and raise fawns. It appeared more does were in poor condition entering the 2012-13 winter, and fawns appeared to be smaller than in previous years. The current postseason population model estimates for 2012 suggest we are still below objective at around 16,300 animals.

Big Game Species: Bighorn Sheep

Ferris-Seminoe Bighorn Sheep Herd Unit: As previously stated, bighorn sheep were translocated from source herds in Oregon and Wyoming into the Seminoe Mountains by the WGFD in 2009 and 2010.

These sheep are moving between this area and the adjacent Bennett Mountains (east of the North Platte River Seminoe Dam) and the east side of the Ferris Mountain range.

Raptors

The previously listed raptors all nest and forage within the watershed. Bald and golden eagles often stay year-long, while other species migrate to warmer climates. The rough-legged hawk spends the winter in the watershed and migrates further north to nest. Prey species are common, with their abundance varying year to year due to climate. Monitoring occurs in some areas of the watershed to determine nest activity and status where broad scale oil and gas activities occur. In other locations, timing stipulations to avoid disturbance during nesting seasons are implemented on a project specific basis. Nest sites are, for the most part natural; however, artificial nests are used to mitigate conflicts between human activities and ferruginous hawk and golden eagle nesting locations.

Threatened, Endangered, Proposed, and Candidate Species:

The following paragraphs describe the current condition of Threatened, Endangered, Proposed, and Candidate species that may occur, or have the potential to occur within this watershed. Species may use portions of the watershed during their entire life cycle or just portions of their life cycle.

Black-Footed Ferret

As previously stated, the status for the black-footed ferret is endangered at this time. There are white-tailed prairie dog towns located throughout the watershed and many of these towns are active. At this time, an actual map of all of these towns has not been completed and surveys would be needed to refine any map that was prepared. Although prairie dog towns are located within the watershed, and some have the potential to support black-footed ferrets, no known black-footed ferrets have been identified recently within the watershed area.

On March 6, 2013, the USFWS issued a letter acknowledging "block clearance" for the state of Wyoming, in response to a request from the WGFD. The letter provides acknowledgement that the likelihood of identifying wild ferrets in Wyoming, outside of those resulting from reintroductions, is distinctly minimal. The letter, and the analysis provided by the WGFD, notes that despite improvements in knowledge, technology, survey techniques, and use of reward programs, there have been no verified reports of any extant black-footed ferret individuals or populations in any prairie dog complex since the discovery of a wild black-footed ferret population in 1981. It further states it is unlikely that black-footed ferret populations in Wyoming have persisted through drastic reductions of prairie dog complexes, and that the black-footed ferret populations have not rebounded as prairie dog complexes have begun to expand again.

Consequently, the USFWS no longer recommends surveys for the black-footed ferrets in white-tailed prairie dog towns in the state of Wyoming. The BLM does recommend that project proponents protect all prairie dog towns or complexes for their value to the prairie ecosystem and the many species that rely on them, and the BLM, RFO, wildlife biologists evaluate potentially disturbed prairie dog towns for their value to future black-footed ferret reintroduction (USDI-FWS, May 24, 2013) (http://www.fws.gov/wyominges/Pages/Species/Species_Listed/BFF.html).

Canada Lynx

As previously stated, the status for the Canada lynx is threatened at this time. Although it is highly unlikely that lynx will reside within the watershed, they may travel through the watershed, specifically using riparian habitats. Lynx are very secretive and are difficult to monitor; therefore, numbers of lynx are hard to obtain. The majority of lynx observations presently occur in western Wyoming in the Wyoming and Salt River ranges and north through the Tetons and Absaroka ranges in and around Yellowstone National Park. Numerous records have also come from the Western slope of the Wind River Range, with fewer observations in the Bighorn and Uinta mountains. There is no Critical habitat for the Canada lynx designated in the watershed (USDI-FWS, May 24, 2013) (http://www.fws.gov/wyominges/Pages/Species/Species_Listed/Lynx.html).

Greater Sage-Grouse

As previously stated, the status for the Greater Sage-Grouse is Candidate at this time (75 FR 13910, March 23, 2010). The BLM has mapped potential Greater Sage-Grouse habitat throughout the watershed and implements protection measures applicable to individual projects to minimize potential impacts from proposed projects.

Currently, the state of Wyoming has adopted a "Greater Sage-Grouse Core Area Protection" Executive Order 2010-4 to ensure Greater Sage-Grouse conservation. The recommendations of the State Sage-Grouse Implementation Team and State of Wyoming's Greater Sage-Grouse "Greater Sage-Grouse Core Area Protection" Executive Order 2010-4 state that development of any type in the identified core areas is done only when no decline to the species can be demonstrated. Executive Order 2010-4 further states the burden of proof for showing development does not affect sage-grouse rests with the industry or proponent in question, and any research they feel is necessary to convey this, should be conducted outside of core areas. If the proposed project is located in an area designated by the state of Wyoming as a core sage-grouse population area then consultation with the WGFD would occur in regards to the project (USDI-FWS, May 24, 2013) (http://www.fws.gov/wyominges/Pages/Species/Species_Listed/GSG.html).

Blowout Penstemon

As previously stated, the status for the blowout penstemon plant is endangered at this time. There are identified areas to the southeast and east of Ferris Mountains that contain populations of the blowout penstemon plant. Continued monitoring of the plant species will occur to determine the extent of the populations. If an action were proposed within the Section 7 Range, potential effects to the species and habitat should be considered. Project proponents are encouraged to contact the USFWS Wyoming Ecological Services Office (USDI-FWS, May 24, 2013) (http://www.fws.gov/wyominges/Pages/Species/Species_Listed/BlowPenst.html).

The biological opinion (BO) was submitted on July 8, 2013 in response to the BLM's request for formal consultation concerning impacts from the BLM's RMPs, to the blowout penstemon plant that may occur on BLM-Administered lands in Wyoming. The USFWS reviewed the Statewide Programmatic Blowout Penstemon Biological Assessment (BA) which described the effects of the Wyoming RMPs and proposed BLM-Committed Conservation measures for the plant. The consultation covered four Wyoming BLM, RMPs: the approved Green River, Casper, and Rawlins RMPs, as well as the draft Lander RMP. The BO addressed potential adverse effects to the endangered plant from BLM activities of one planned program, as well as the BLM's commitment to the Conservation Measures listed in the BLM's, BA. The

Livestock Grazing Management Program of the Rawlins RMP is the planned program that may affect, or is likely to adversely affect, the blowout penstemon is. (USDI-FWS, July 8, 2013).

Ute Ladies' Tresses

As previously stated, the status for the Ute ladies'-tresses plant is threatened at this time. The Ute ladies'- tresses plant has currently not been identified to exist in the watershed; however, it has the potential to occur and the USFWS has concluded that it may occur in the area. If an action is proposed within the Section 7 Range, potential effects to the species and habitat should be considered (USDI-FWS, May 24, 2013) (http://www.fws.gov/wyominges/Pages/Species/Species_Listed/ULT.html).

North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, and Western Prairie Fringed Orchid

The North Platte River species include the endangered interior least tern, pallid sturgeon, and whooping crane and the threatened piping plover and Western prairie fringed orchid. The status for each species is identified above. Although these species are not located within the watershed, if a proposed action may lead to consumptive use of water, or have the potential to affect water quality in the Platte River System, there may be impacts to these threatened and endangered species, which inhabit the downstream reaches of the river system. Any proposed projects leading to water depletion within the North Platte River ecosystem must evaluate impacts to these downstream species (USDI-FWS, May 24, 2013) (http://www.fws.gov/wyominges/Pages/Species/Species_Listed/PltRiv.html).

BLM State Sensitive Species:

There are eight mammals, 13 birds, three amphibians, and four plants that have been identified as BLM State Sensitive species and may occur, or have the potential to occur, within the watershed area. There are known ferruginous hawk and bald eagle nests, and burrowing owls and mountain plover have been observed with some identified nesting habitat. Greater Sage-Grouse leks are monitored throughout the watershed by WGFD and BLM Wildlife Biologists from March through mid-May each year to determine activity status of each lek. Populations of Greater Sage-Grouse are declining across the West and in Wyoming; however, the actual cause(s) for this decline is unknown. Less is known of other BLM-Sensitive State Species; however, habitats for these species are present and future inventoring or monitoring should occur to determine abundance and habitat use.

Mammals

Long-eared myotis, fringed myotis, spotted bat, Townsend's big-eared bat: Inventories are being conducted by BLM Biologists as time permits within the watershed to continue to map these species. In general, there should not be any impacts to bat species as a result of actions being implemented within the watershed.

White-tailed prairie dog: There has been mapping of white-tailed prairie dogs within the watershed; however, most of this mapping occurred in the early 2000's and mapping for the entire watershed has not been completed to date. In general, there should not be any impacts to white-tailed prairie dogs as a result of actions being implemented within the watershed.

Wyoming pocket gopher and pygmy rabbit: The WYNDD and the BLM have been conducting inventories for both the Wyoming pocket gopher and the pygmy rabbit within portions of the watershed. Projects are analyzed on a site-specific level to determine if habitats exist for these two species. In general, site-specific analysis and the use of mitigation measures for proposed projects should reduce and/or

eliminate any impacts to these two species resulting from the implementation of actions within the watershed.

Swift fox: This species has the potential to occur within the watershed, but at this time den locations have not been mapped. In general, site-specific analysis and the use of mitigation measures for proposed projects should reduce and/or eliminate any impacts to this species resulting from the implementation of actions within the watershed.

Birds

Loggerhead shrike, sage thrasher, Brewer's sparrow, sage sparrow, white-faced ibis, trumpeter swan, long-billed curlew: These species have the potential to occur in the watershed. Projects are analyzed on a site specific level; however, it should be noted that nests are difficult to locate at times, especially when the project analysis is completed outside of the breeding time periods. To the BLM Wildlife Biologists' best ability, specifically for neo-tropical migratory birds, the use of any site-specific analysis and mitigation measures for proposed projects should reduce and/or eliminate any impacts to these species resulting from the implementation of actions within the watershed.

Bald eagle: Although there are known bald eagle nests located along the North Platte River drainage, at this time, the actual number of new nests has not been updated. Most of the bald eagle nests are located further north in the Casper Field Office area. Winter habitat has not been identified in the RFO area.

Northern goshawk, ferruginous hawk, peregrine falcon, burrowing owl: Projects are analyzed on a site specific level; however, it should be noted that nests are difficult to locate at times, especially when the project analysis is completed outside of the breeding time periods. To the BLM Wildlife Biologists' best ability, specifically for raptor species, the use of site-specific analysis and mitigation measures for proposed projects should reduce and/or eliminate any impacts to these species resulting from implementation of actions within the watershed.

Mountain plover: Mountain plovers occur in the watershed and have the tendency to return to the same breeding and nesting areas each year. Known locations are around Wamsutter and on the North side of the Ferris Mountains. However, large amounts of suitable habitat are available across the watershed, and sightings have usually been associated with clearances from natural gas developments or associated projects. Occupied habitat is defined as two or more observations of mountain plovers within two miles of each other during one breeding season of any of the following: territorial adults, nests, adult distraction displays, and/or broods. Mountain plover have been observed in the watershed during the reproductive period between mid-April through mid-July.

Plants

Cedar Rim thistle, persistent sepal yellowcress, Laramie false sagebrush, and limber pine: The WYNDD and the BLM have been inventorying for the Cedar Rim thistle, persistent sepal yellowcress and Laramie false sagebrush plants within portions of the watershed. Projects are analyzed at the site-specific level to determine if habitat exists for these species; however, this can only occur during flowering periods. When projects are analyzed during these time periods, then site-specific analysis and the use of mitigation measures can reduce and/or eliminate any impacts to these species as a result of actions being implemented within the watershed. The fact that these time periods only occur in the summer months makes it difficult to determine if these plant species exist when analyzed during the fall, winter and early-spring months.

Limber pine are common on and adjacent to Ferris and Seminoe Mountains, and the rockpiles in the Sweetwater River drainage, and less common along locations like the Rawlins uplift, Lost Soldier Rim and the Haystacks. Numbers of this species is declining, particularly in the Ferris Mountain area, where white pine blister rust and mountain pine beetle infestations have resulted in the death or stunting of many trees. During fieldtrips to Ferris Mountain during the preparation of the environmental assessment for prescribed burning and management of natural ignitions, it was observed that most pine trees one foot or taller in height were already affected by white pine blister rust. In more isolated stands there does not appear to be little if any disease or death of trees beyond the normal expected.

4) Reference Conditions

Refer to the reference conditions discussed in the 2003 watershed report.

5) Synthesis and Interpretation

The following analyzes changes in wildlife populations and their associated habitats since the 2003 report. Livestock impacts, although still present, and range conditions on upland and riparian habitats are improving in most areas. Antelope, elk, and mule deer are generally thriving, and Wyoming has the largest population of Greater Sage-Grouse in the country. Native plant species are still present and weeds, although present in some areas, have not taken over large areas of the range. Wild horse numbers were above objective prior to 2006, and, along with the current drought, may have been impacting wildlife species. Impacts from oil and natural gas development, off-highway vehicle use, and loss of or modification to habitats from developments on private land in checkerboard areas continue to increase. Lack of fires have led to a predominance of mature to decadent shrubs in some areas, and conifer encroachment has occurred along the Ferris Mountains. The following analyzes specific habitat conditions within the watershed and the effects these may have on wildlife species.

Species of Interest or Concern

Big Game Species - Antelope

Antelope continue to be the most visible and abundant big game species in the watershed, due to large expanses of rangelands dominated by big sagebrush. The most obvious changes to the landscape is within the CD-C natural gas project area where the number of roads, gas wells and pipelines have increased to nearly double the amount of projects compared to 10 years ago, leading to increased fragmentation and short-term loss of habitat. Whether these impacts are having an effect upon antelope is not known; and therefore, one of the research projects set to begin in the coming year is an antelope study to identify causal impacts from energy developments upon antelope, better define migration routes, and determine barriers to animal movements such as fences. Antelope diets continue to consist primarily of big sagebrush, as evidenced by the more recent (2007-09) fecal analysis from the Lost Soldier Creek drainage, consisting of 84 percent composition of sagebrush in May and 98 percent in November. The health of Wyoming and mountain big sagebrush appears to be stable (outside of habitat loss to development) to upward in trend, based on transects and photos across the watershed. Sagebrush cover along transects was similar when compared to the earliest documentation in the mid-1990s, and seedlings and young sagebrush plants were abundant in most areas following the 2009-2011 wet period. In the long term, 3x3 photos from Bar Eleven, Jawbone, Larson Knoll, and Shamrock Hills allotments first taken in 1970, show very obvious increases in sagebrush cover when compared to 2012 photos. In some locations, the increase in sagebrush cover is occurring as an encroachment into saltbush and birdsfoot sagebrush communities, where the sites may have been historically degraded from livestock grazing and lost their top soil component. As the soils recover and an “A” horizon

reforms, the improving soil conditions support the growth of big sagebrush. Although there were not any sites observed with a lot of dead sagebrush, there are sites with moderate to heavy browsing that should be permanently monitored in the future to ensure maintenance of winter habitat for antelope. These locations range from Bairoil south to Separation Rim, south and east of the Stone Ranch, and in the Cheyenne Ridge area west of the Seminoe County Road. Transects monitored during 2012 in the region between Bairoil and Separation Rim averaged 39 percent browse use on big sagebrush; these plant communities appear to be stable with young and seedling sagebrush plants recently established.

Impacts from livestock fences on big game movement have been well documented. Antelope research within the RFO in the early 1980s identified north-south fences on the north side of Interstate 80 (I-80), were a problem, particularly for antelope, contributing to high mortality during the winter of 1983-84. In the past 10 years, there have been 48 miles of fence conversion within the watershed, including approximately 27 miles along the north side of I-80. All north-south fences that border I-80 have been modified, most where BLM supplied the materials and permittees and BLM shared in the labor to modify them. In some corner locations gates have been installed that are left open in the winter to improve big game movement. The WGFD also worked with permittees to modify the fences along the border of the Chain Lakes WHMA, and on the south side of I-80 in the Red Rim/Daley WHMA. New fences in the region were all constructed to BLM standards. The three principle areas that still need conversion in this region are around the Jawbone, Monument Lake and Shamrock Hills allotments. The other area where more recent fence modification work has occurred, is in the vicinity of Ferris Mountain. Approximately 11 miles have been modified to BLM standards along the north and east sides of the mountain, with six miles currently being reconstructed to BLM standards following the 2012 Ferris Mountain wildfire. These fence conversions benefit antelope, mule deer and elk, and are presently a priority in the improvement of big game movement around the periphery of the mountain. There are three more fences on the south side of the mountain being converted within the next two years. However, the larger landscapes around the Ferris and Seminoe Mountains are a priority in regards to modifying fences since four large allotments (Buzzard, Ferris Mountain, Seminoe and Stone) were historically used by sheep and still have sheep type fencing.

Changes in livestock management implemented over the last 10 to 20 years and the results having been described in previous sections of this document, should maintain or enhance antelope populations. Fencing of natural water sources and the development of additional off-site water sources provide more sites and improved water quality to antelope and other wildlife. The RFO has equipped (with help from NGOs) seven wells in the Cyclone Rim and Stewart Creek allotments that are in operation all summer to improve distribution of all users, including wildlife, wild horses, and livestock. Additional water projects in North Creston-West, Bell Springs, Echo Springs, Sandstone and Lazy Y-S Ranch allotments remain on and/or developed/protected for use by wildlife with funding from industry, NGOs, BLM and permittees. Water sources in winter ranges are either not developed or consist of wells with controllable water sources in order to discourage summer season use by big game in these areas.

The maintenance of healthy, diverse big sagebrush plant communities has received a high degree of attention across the Western United States. In the RFO, there have been concerns over the large amount of mature and decadent stands of sagebrush, and the need for mixed age classes and seral species that would benefit sagebrush obligate species. Of the 45,000+ acres treated within the watershed over the past ten years, approximately 27,000 acres were in mountain big sagebrush habitat, and all but 1,000 acres were thinned with aerial applications of Tebuthiuron. Stands of Wyoming big sagebrush generally do not get dense enough to warrant treatment in the RFO. The thinning of sagebrush will provide openings for new sagebrush and in some areas mountain shrubs, such as snowberry, will result in more varied age classes, structure and higher plant vigor. These changes should be beneficial to antelope. Disturbance and reclamation of sagebrush habitat within the CD-C

natural gas field have had mixed results regarding sagebrush recovery. In most areas the grasses are established first to stabilize soils and reduce the potential for weeds, with slow long-term recovery of sagebrush. In a few areas, natural reinvasion of disturbed sites by sagebrush is occurring.

Big Game Species - Elk

Elk populations continue to do well, with longer seasons and higher numbers of licenses being issued to lower animal numbers towards population objectives for all three management units. Although there are elk in the Red Desert herd and Ferris/Seminoe Mountains, the majority of elk are in the Atlantic Rim area and to the west with higher snow accumulation during the winter. As stated earlier, high elk numbers and snow cover in 2010 led to around 1000 head of elk reaching the south side of Rawlins and attempting to move north across I-80 prior to WGFD herding them further south. Although there is significant diet overlap between elk and cattle, most elk summer on National Forest lands and winter on BLM and private lands. During the winter most allotments do not receive cattle use, so there is little direct competition between elk and cattle in those areas. In addition, summer cattle use is primarily directed at foraging in valley bottoms and adjacent lower hillsides, with cattle preferring the finer leaved upland grass species, such as bluegrasses, needlegrasses, fescue and Indian ricegrass. In the winter elk forage more readily on the windswept ridges and upper hillsides on south and west facing slopes. Forage on these sites is usually dominated by bluebunch wheatgrass, which stays more upright with wind and snow as compared to the finer leaved grasses that get matted down. Basin wildrye in the bottoms also remains upright and is more available for elk use. The species has increased greatly following prescribed burning and shifts to rotated or deferred cattle management. Due to high elk numbers and elk hunters, the WGFD has proposed raising management objectives for both the Baggs and Ferris elk herds. The BLM is working with the WGFD to collect utilization information, fecal analysis, and other data to support future decisions. However, large populations of elk as compared to herd objectives is likely an indication that habitat conditions for elk have been good with the exception of lichen effects, and directly correlates with improving conditions of upland and riparian habitats described in previous sections.

Fence modifications that benefit elk have been a lower priority compared to antelope and mule deer. Conversions have been completed at the Fillmore allotment (2 miles) on Atlantic Rim and around the periphery of Ferris Mountain (11 miles) and have the greatest benefit to elk movement. In locations where higher elk use is anticipated, fences are constructed with a wood post/rail top design to lessen both the potential injury to animals, as well as fence maintenance. NGOs, including the Rocky Mountain Elk Foundation (RMEF), Wyoming Governors Big Game License Coalition (WGBGLC), and Wyoming Wildlife and Natural Resource Trust (WWNRT) have all supported fence conversions in the Ferris Mountain area. Additional fence conversions in the Ferris and Seminoe Mountain area are planned in the coming years. The high tensile (electric) pasture fencing constructed in the Cherry Creek and Fillmore allotments has appeared to work well, in terms of allowing animal passage with a lower amount of fence maintenance.

Recent prescribed burns, wildfires, and managed natural ignitions on Ferris and Seminoe Mountains, in addition to conifer cutting in riparian zones, are slowly improving habitat for elk. Re-sprouting shrubs and aspen, along with returning grasses, will support healthy elk populations and wildlife in general, although the wildfires left little hiding cover for elk, which may change their use patterns in some locations. The long-term return of aspen woodland and riparian corridors to more herbaceous and shrub composition will provide higher quantity and quality of forage for elk in the long-term. However, recent treatments only affected about 25 percent of Ferris Mountain, so additional projects need to occur in the future in order that habitat improvements continue. Two prescribed burns planned for Atlantic Rim will also benefit elk by improving aspen woodland and mountain shrubland habitat. These

projects are now within Greater Sage-Grouse core habitat and are evaluated as disturbance similar to natural gas field development. Although these habitats are not typically used by Greater Sage-Grouse , and improving their health and plant vigor would benefit other wildlife, including mule deer and elk, the politics and interpretations of implementing the Greater Sage-Grouse policy make the use of prescribed burns more difficult to accomplish. In contrast, the use of Tebuthiuron to thin sagebrush stands is much easier to implement within Greater Sage-Grouse core habitat; and therefore, has received more use in these areas. These treatments release the grass and forb understory while removing part of the sagebrush canopy, thereby improving forage production for both livestock and wildlife. However, wherever there is core area treatments are being developed and implemented in a mosaic pattern to address any grouse concerns. In the Red Desert, where tebuthiuron has been used, there is the potential for competition between cattle and elk for forage since the elk do not migrate to the National Forest in the summer. The relatively small population of elk in the herd unit minimizes the effects of any competition between species in regards to forage, water or space.

Energy development effects on elk and pronghorn have not been well documented in this area. As stated above, one research project set to begin in the coming year is an antelope study to identify causal impacts from energy development upon antelope, and to better define migration routes and barriers to animal movement such as fences, Additional studies such as this are planned for elk in the future, dependent upon funding.

Big Game Species - Mule Deer

The majority of mule deer in the watershed tend to use the sandhills and rougher terrain around the Ferris and Seminoe Mountains, in addition to Atlantic Rim, Lost Soldier Rim, Windy Hill, the Haystacks, and Rawlins Uplift. These areas support more diverse sagebrush, mountain shrub, and aspen woodland habitats preferred by mule deer, as well as riparian habitat. Transects on the east and west ends of Ferris Mountain were monitored in 2012, primarily in bitterbrush and mountain mahogany plant communities. Overall browse use was light to moderate on all sites, with good leader growth and plant vigor. Mule deer use of woody riparian habitat is higher than antelope or elk, so changes in livestock management and improved condition of riparian habitatare very beneficial to mule deer. Improved vigor and composition of willow, dogwood, currant, silverberry, hawthorn and aspen all lead to improved forage and/or cover for mule deer, as well as diverse species composition of forbs. Improved upland conditions should also benefit mule deer, as long as there is a mixture of forbs and grasses. The wet period in 2009-2011, led to the establishment of many new plants, including grasses, forbs and shrubs, which should benefit mule deer. The only concern is that grasses and sedges be managed so well that they end up dominating the plant community and important, desirable forbs be reduced in abundance as a result of this , which would have negative impacts on wildlife, including mule deer. Riparian pastures created to manage use by livestock and/or exclude use by wild horses will benefit wildlife, particularly mule deer, by providing forage and cover not affected by large ungulate species during the spring and summer.

The fence modifications described under antelope and mule deer will also benefit mule deer. Their use is higher in the areas inhabited by elk, but they also use the lower country with antelope; and the younger fawns will be able to move underneath fences much easier with the removal of mesh fencing. Top wire heights in some areas are now lower, and the top two wires are now spaced 12 inches apart in BLM standard fences, that will reduce the likelihood of mule deer getting their feet caught between the top two wires, which happens with more closely spaced wires. The top wire spacing and/or use of rail-top fencing will also benefit mule deer and reduce injury and/or mortality caused by fences. Additional fence conversions are needed, as well as information on migration corridors or other data to help prioritize locations for modification projects.

Vegetation treatments, wildfires, and managed natural ignitions should benefit mule deer more than any other species of big game. Mule deer are browsers, but compared to antelope, have a much broader range of species they select for and eat. Although bitterbrush was negatively affected by the recent wildfires, sprouting species, such as chokecherry, snowberry, maple, aspen, currant, silver and Wyoming three-tip sagebrush, and ceanothus were all enhanced with the removal of competing conifers. The ceanothus response on Ferris Mountain is both widespread and high in density (description in Upland Vegetation section), which should increase shrub diversity and forage for mule deer tremendously. Fecal analysis studies on nearby Green Mountain in the 1980s showed Oregon grape as the most preferred diet component in the winter by mule deer and snowberry as the most preferred diet species in the spring, both of which were enhanced with recent prescribed burns and wildfires. Aspen on hillsides, and other shrub species along drainages, should increase due to burning and create more forage and cover for mule deer as well. The Ferris mule deer herd, which has been below population objectives for many years, may finally see more recruitment, and recover from the hydrologic drought and drying of the riparian habitat in the Ferris dune ponds south of the mountain. Aerial treatments of tebuthiuron should also benefit mule deer by increasing shrub and forb diversity and production. However, early seral species are not enhanced with the chemical treatment, so the habitat enhancement in these areas is not as high as in areas that are burned.

Big Game Species - Bighorn Sheep

Bighorn sheep (*Ovis canadensis*) were originally translocated into the Seminoe and Ferris Mountains in 1958 and additional animals were relocated until 1985. The original number of animals relocated to the Seminoe and Ferris Mountains totaled 237. The bighorns relocated to the area, were trapped out of the Whiskey Mountain Wildlife Habitat Area near Dubois, Wyoming. The animals trapped were high-elevation, migratory bighorns, which had evolved with the area's seasonal climatic variations (i.e. vegetation phenology cycles), and migrations along steep elevation gradients from summer to winter ranges. None of the above topographic/climatic features are present or required of sheep within the Seminoe and Ferris Mountains, and it is these factors, along with lambing dates, reduced habitat health and the presence of adjacent domestic sheep herds, that were attributed to the decline of the bighorns originally translocated.

In 2009, the Ferris and Seminoe Mountain bighorn populations were estimated at 19 animals across both mountain ranges. That same year, the WGFD began translocation efforts of bighorns from source habitats similar to those within the Seminoe and Ferris Mountains. The utilization of animals from similar source habitats has proven successful in other translocation projects within the state (i.e. Devil's Canyon). Over the course of two years (2009-2010) a total of 52 bighorn sheep were relocated into the Seminoe Mountains. The majority of the sheep came from Oregon's John Day River Canyon and the Diablo Mountains (40 animals – nine males and 31 females) (Standard #4 – Page 3 photos). The remaining animals were trapped out of Wyoming's Devil's Canyon herd unit (12 animals – three males and nine females).

All bighorns translocated into the Seminoe Mountains were fitted with telemetry/GPS collars so that animal locations, habitat selections, and mortalities could be recorded and documented. Preliminary data suggest that the newly translocated bighorns have higher lamb survival rates and fewer mortalities compared to previous translocation efforts in the Seminoe Mountains (Sawyer et al. 2011). Initial observations also revealed very little movement away from the translocation area, and more concentrated sheep use around the edges of the Seminoe Mountains, which may relate to taller and more dense vegetation (particularly conifer encroachment into shrublands).

Since the translocation of bighorns into the Seminoe Mountains approximately 7000 acres, within a 26,000 acre identified project area have been treated during spring months (March-April), with

prescribed fire. These treatments were developed around wildlife habitat needs and fuels reduction. Primary goals and objectives of the prescribed fire treatments included:

> *Treat (burn) 50% w(with a range of 30 percent -70 percent of the dense, even-aged (and even structured) sagebrush and mixed sagebrush/mountain shrub communities withinthe identified treatment units. Stands targeted for treatment should contain <40 percent aerial cover sagebrush, and/or bitterbrush, mahogany, serviceberry, and/or snowberry (composite).*
>
> *Treat (burn) decadent/diseased timber stands for the purpose of timber health and the enhancement of wildlife habitat.*
>
> *Treat (burn) timber stands and areas of timber encroachment to increase visual and travel corridors for bighorn sheep.*

During the summer of 2012 (7/21-7/28) a wildfire, resulting from a lightning strike, ignited within the Seminoe Mountains. The Seminoe Mountain wildfire burned and additional 3,830 acres within an untreated portion of the originally proposed Seminoe Mountain prescribed fire project area, elevating the total treatment acres, by fire, within the Seminoe Mountains to 10,830 acres.

Current bighorn populations within the Seminoe Mountains are estimated to be over 100 animals, and a single bighorn sheep hunting license was issued for Seminoe Mountains for the 2013 hunt season. A thesis study titled "Habitat Ecology and Effects of Habitat Alteration for Bighorn Sheep Translocated to the Seminoe Mountains, Wyoming" – by Justin G. Clapp and Jeffrey L. Beck; is currently being conducted through the University of Wyoming, and its completion/results are expected spring of 2014. Results of this research and vegetation recovery within the Ferris Mountain wildfire area, as well as additional vegetation treatments, may help set a timetable for translocation of additional bighorn sheep at Ferris Mountain.

Raptors

Raptors are primarily affected by climate (indirect effects on prey species) and human activities around nesting and perching areas. Ferruginous hawks, and to a lesser extent golden eagles, will nest on man-made structures, such as gas well facilities, windmills, and old corrals and buildings; therefore, artificial nests are used to draw the birds away from these sites so that human activities do not force the abandonment of active nest sites. These artificial nests have also been documented to be more productive in terms of the number of birds fledged per nest compared to natural sites (picture 87-1). The BLM has a timing stipulation for raptors attached to any proposed project that is located within three-quarters of a mile to one mile (depending on each species) from any nest that prohibits surface disturbing and other activities from occurring between February 1 and September 15 each year. In addition, the Bald Eagle and Golden Eagle Protection Act, 16 U.S.C. 668, prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any Bald or Golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing. The Migratory Bird Treaty Act of 1918 (MBTA)(16 U.S.C. 703–712 [although §709 is omitted]), makes it unlawful without a waiver to pursue, hunt, take, capture, kill or sell birds listed therein ("migratory birds"). The statute does not discriminate between live or dead birds and also grants full protection to any bird parts including feathers, eggs and nests. Over 800 species are currently on the list protecting several species located within the watershed area.

Threatened, Endangered, Proposed, and Candidate Species

Black-Footed Ferret, Canada Lynx, Greater Sage-Grouse, Blowout Penstemon, Ute Ladies' Tresses, and North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, and Western Prairie Fringed Orchid: The BLM Wildlife Biologists complete informal and/or formal conferencing and/or consultation with the USFWS for all proposed projects that may contain habitat, or the species themselves, to avoid adverse impacts to threatened, endangered, candidate, and proposed species. All proposed projects have a field site investigation completed prior to disturbance to determine if suitable habitat for species exists. Projects are located outside of suitable habitat or surveys are completed; therefore, there should not be any impacts to these species as a result of authorizing actions on BLM-Administered lands. The 2008 RFO, RMP, BA contains Habitat and Species Conservation Measures and BMP's and the BO contains Reasonable and Prudent Measures and Terms and Conditions that are implemented to minimize impacts of incidental take to these species from authorized actions.

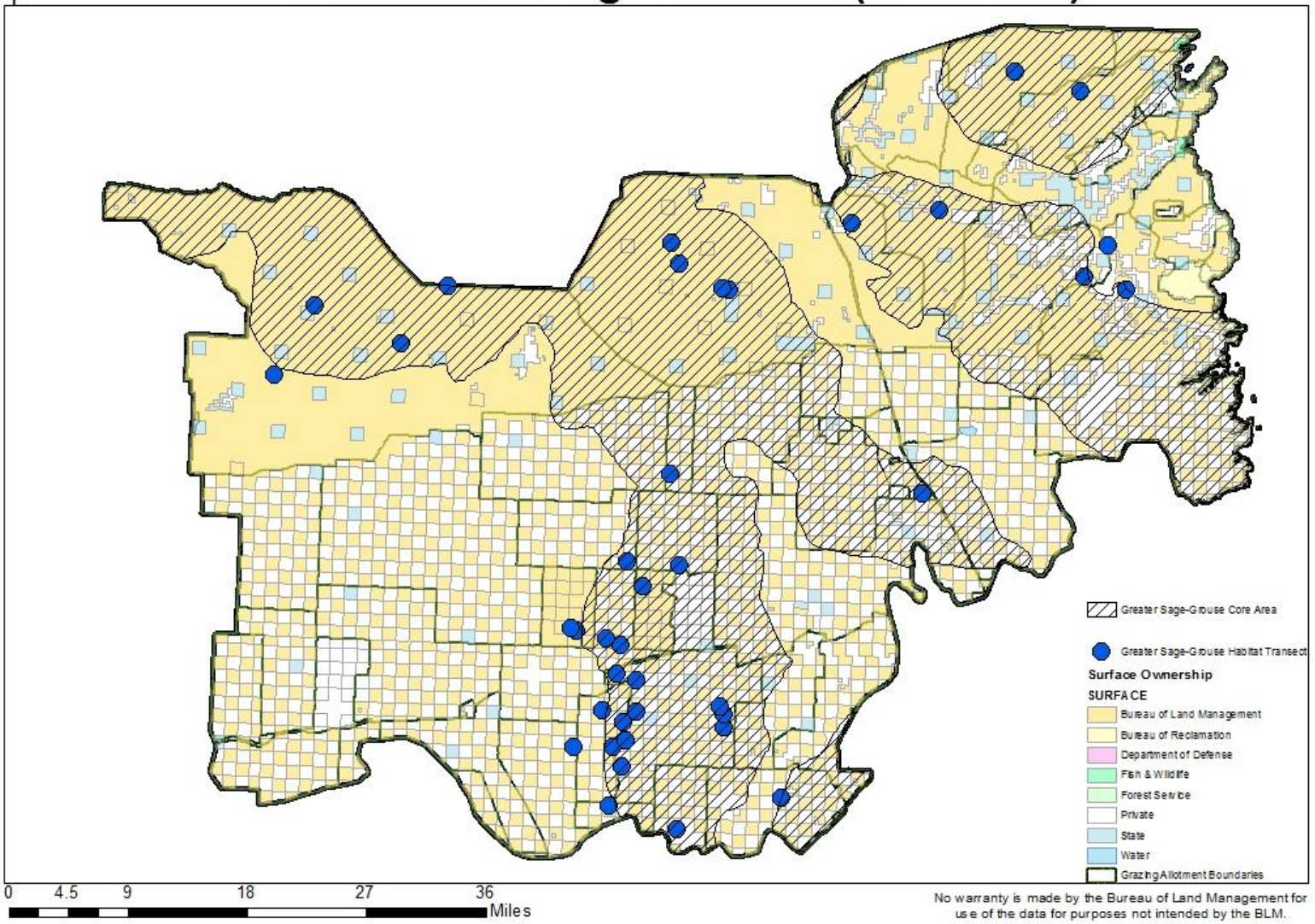
There are opportunities to improve both upland and riparian habitats used by Greater Sage-Grouse, specifically in areas containing too much big sagebrush, lack of species diversity and forb abundance, and not enough residual cover for high nesting success (Standard #4 – Page 4 photo). The 30 transects established in nesting/early brood-rearing habitat in the watershed showed the presence of suitable habitat for 17 locations, with the 13 marginal sites consisting of two short of sagebrush or low forb abundance/new grass heights that relate more to low elevation and precipitation than to livestock grazing (Standard #4 – Page 4 photo). Additional transects may need to be located in more dense big sagebrush, following the research by Kirol indicating a mean canopy cover of 39 percent was being selected for (Map #8). On the north side of Ferris and Seminoe Mountains there is very little dense sagebrush so additional nesting habitat data may be needed. Understory grass and forb cover in nesting transect locations was generally good, although obviously affected by the drought in 2012. Residual grass heights were more than adequate; however, new grass height and forb abundance were both lower in 2012, and showed recovery in 2013, when there was at least average precipitation in April. Additional spring diet composition for Greater Sage-Grouse in this area would be warranted, as a number of the desirable forbs listed in the Greater Sage-Grouse Framework Plan are not found here and/or are not native. Summer and fall brood-rearing habitat is especially dependent on riparian habitat, which is most influenced by livestock management, and stream segments that are not in proper functioning condition are also not providing high quality habitat for grouse. The creation of riparian pastures in many locations, where livestock use is excluded, deferred until fall, or used for short duration grazing, should improve riparian habitat condition for use by Greater Sage-Grouse and other wildlife. Continued implementation of livestock grazing BMPs would improve the condition of both riparian and upland habitats for this species. Monitoring of condition and trend in both these types of habitat will help ensure that the habitat needs of Greater Sage-Grouse are being met. Several miles of fence have already been marked to improve visibility to Greater Sage-Grouse and reduce bird strikes, injury and/or mortality (Standard #4 – Page 4 photo). Data from research on bird movements is also revealing high densities of bird use in areas that fences will be checked for bird strikes and markers installed where needed. New vegetation treatments are following the current Greater Sage-Grouse policy and incorporating local research in terms of designing treatment areas, avoiding nesting sites, and the use of more mosaic treatments in patches or strips to reduce negative effects to Greater Sage-Grouse. The enhanced herbaceous production and cover, particularly under dead shrubs, should improve habitat for nesting and early brood-rearing. Shrub recovery in areas affected by wildfires and prescribed burns is generally occurring within 30 to 50 years, as mountain big sagebrush returns much faster than Wyoming big sagebrush. Shallow soil sites supporting black sagebrush, which does not return very quickly after fire, may need to be closely monitored to improve the understanding of fire ecology in this habitat type. Improved reclamation efforts should also benefit grouse, including the use of more forbs in seed mixtures. However, this continues to be a problem as native forbs for this region are not available as seed for reclamation, particularly succulent species, like clover. Private landowners are working with energy companies to seed desirable species, such as alfalfa, sweetclover, and

milkvetches with BLM assisting in monitoring efforts, since these are not native species and are not being planted on public lands. Manipulation of wild horse distribution and utilization, where they overlap with grouse habitat, would also benefit the species.

Another tool the BLM uses is a timing stipulation attached to any proposed project that is located within Greater Sage-Grouse habitat, which prohibits surface disturbing and other activities from occurring between March 1 and July 15 for the protection of strutting and nesting Greater Sage-Grouse. Generally, projects are not located within one-quarter mile of an identified lek; and proposed projects are moved as far away as possible from active leks. The BLM has a winter Greater Sage-Grouse timing stipulation that prohibits surface disturbing and other activities from occurring between November 15 and April 30 for the protection of winter concentration areas.

The 2008 RFO, RMP, states that surface disturbing activities will be avoided in the identified 100-year floodplains, within 500 feet of perennial waters, springs, and wetland and riparian areas, and within 100 feet of the inner gorge of ephemeral channels These mitigation measures reduce disturbance to the threatened Ute ladies'-tresses plant. Only those actions within areas that cannot be avoided and that provide protection for the resource identified, such as the Ute ladies'-tresses plant, will be approved.

Map 8 - Greater Sage-Grouse Core Areas
Habitat Monitoring Locations (Transects)



BLM State Sensitive Species

***Mammals, Birds and Plants*: Long-eared myotis, fringed myotis, spotted bat, Townsend's big-eared bat, white-tailed prairie dog, Wyoming pocket gopher, pygmy rabbit, and swift fox; and loggerhead shrike, sage thrasher, Brewer's sparrow, sage sparrow, white-faced ibis, trumpeter swan, long-billed curlew, bald eagle, Northern goshawk, ferruginous hawk, peregrine falcon, burrowing owl, and mountain plover; and Cedar Rim thistle, persistent sepal yellowcress, Laramie false sagebrush, and limber pine**: All proposed projects have a field site investigation completed prior to disturbance to determine if suitable habitat exists for the species. Projects are either located outside of suitable habitat or surveys are completed. In general, there should not be any impacts to these species as a result of authorizing actions on BLM-administered lands.

Inventories are occurring by BLM Biologists, as time permits, within the watershed to continue to map these species. The BLM has a timing stipulation attached to any proposed project that prohibits surface disturbing and other activities from occurring between April 10 and July 10 that is located within potential mountain plover habitat, and additional protection measures may be applied to proposed projects located within mountain plover occupied habitat. Habitat loss and/or degradation is more difficult to measure and mitigate for these species.

Limber pine trees have expanded historically into shrublands, aspen and cottonwood riparian areas due to natural plant succession and suppression of wildfires. The previous forester at the RFO believed that the more contiguous location of limber pine on Ferris Mountain increased the potential spread of disease, and that more isolated pockets of trees in rockpiles and rims would be less susceptible. The recent wildfires and prescribed burns on Ferris and Seminoe Mountains have reduced the number of limber pine where they killed by fire, but may improve the health of remaining trees by reducing diseased trees and increasing the distance between stands. Recent collections and seedling establishment of limber pine trees resistant to white pine blister rust may potentially be considered for planting on Ferris Mountain to improve the health and maintain this species in this watershed area.

6) Recommendations:

It is determined that the majority of the Great Divide Basin assessment area is meeting Standard #4 with respect to wildlife, due to the existing good condition of native vegetation and its ability to support the diverse wildlife populations. The principal area deemed not to be meeting Standard #4 for wildlife habitat is the central and western portions of Ferris Mountain, about 20,000 acres, due to loss of aspen habitat and the disease, decadence, and encroachment of conifers into shrubland and riparian habitats. Habitat needed to support healthy wildlife populations and listed or proposed threatened and endangered species is generally in acceptable condition; however, this does not mean that there aren't problems or concerns about wildlife habitat. The discussion under Standard #2 – Wetland/Riparian Health and Standard #3 – Upland Plant Health outlines the current conditions and recommendations for improving management of these resources. It has been determined that livestock grazing is not a principle factor in the non-attainment of this standard.

To meet the needs of all wildlife, the management actions identified under the 2008 RFO RMP, Section 2.3.18 *Wildlife and Fisheries*, will continue to be utilized when implementing authorized actions on BLM-administered lands. These will also be used to meet the recommendations described for Standards #2 and #3.

Species of Interest or Concern

Big Game Species - Antelope, Elk, Mule Deer, and Bighorn Sheep

Modify existing sheep-type fences and older cattle-type fences to meet the BLM standards. This should be accomplished in key locations in the short-term, while working towards all fences in the long-term. A specific number of miles should be accomplished each year, and cooperative efforts should be pursued with grazing permittees, WGFD, and conservation districts. When possible, relocate fences to reduce impacts to wildlife movements. Encourage livestock permittees to leave gates open when not needed and/or through as much of the fall through spring seasons to reduce impacts to wildlife moving between seasonal ranges. Documentation of locations where fences are affecting big game movements should continue, particularly for the new fences, such as the Seminoe Road highway fence. Impacts to big game species due to CBM development should be mitigated, particularly if new or additional development of these resources occur in the future, possibly by modifying existing fences to improve access to less disturbed winter habitats.

Management plans should consider other grazers, such as wildlife and wild horses, in making recommendations and to properly assess impacts. Water developments should benefit as many species as possible. In winter ranges, projects should be controllable or small (ephemeral) in nature, as not to encourage year-round wildlife use. Isolated desert water sources, and associated riparian habitat, should be protected and managed to meet the needs of wildlife. Additional water sources such as guzzlers, should be developed to improve water availability and reliability for wildlife (Standard #4 – Page 5 photos). The LFO should be encouraged to convert domestic sheep AUMs in the Whiskey Peak allotment to cattle to prevent disease transmission to bighorn sheep using Ferris Mountain. Monitoring information, particularly trend data for big game crucial winter range, should be coordinated with the WGFD for use in evaluating and adjusting herd objective levels.

Continue to implement vegetative treatments in shrub and woodland habitats to improve the diversity of cover, species, age-class, vertical structure, and mosaic mix of plant communities. Management efforts should also emphasize the use of naturally ignited fires to benefit resource values in accordance to pre-planned conditions and objectives outlined in a Wildland Fire Implementation Plan. Monitor the effects for all treatment projects, to document and analyze results and improve future prescriptions to achieve management objectives. Utilize habitat recommendations for Greater Sage-Grouse and other species in both assessing and planning habitat treatments and continue the development of interagency long-term habitat treatment plans.

Maintain wild horse populations within established herd population levels. Monitor to evaluate the impacts on vegetative communities and wildlife habitat and determine if current levels represent a proper long-term population of wild horses.

Evaluate the need, and institute measures where necessary, to reduce disturbance to big game species on crucial winter ranges, or other habitat areas where needed. This could involve seasonal closures of roads, seasonal closures of habitat for antler collecting, general off-highway vehicle use, transportation planning for oil and gas development, and other activities. Private landowners should be encouraged to leave their lands unfenced, or use fence designs that are compatible with big game movements (USDI-BLM, 2003)).

The BLM should continue to use the seasonal restriction stipulations for big game species which prohibits surface disturbing and disruptive activities within big game crucial winter range during the period of November 15 to April 30. Surface disturbing and disruptive activities within identified big game parturition areas will not be allowed during the period of May 1 to June 30. Disruptive activities

within big game crucial winter range will require the use of BMPs designed to reduce the amount of human presence and activity during the winter months. Surface disturbing and disruptive activities will be managed, on a case-by-case basis, in identified big game migration and transitional ranges to maintain their integrity and function for big game species in these areas. Fences identified to be a problem to big game migration will be modified to meet BLM fence standards and although new fences are allowed in big game migration corridors, they will only be authorized if they meet BLM fence standards. In addition, water developments for livestock and wild horse use will be allowed in crucial winter range when they are consistent with wildlife habitat needs.

Raptors

The BLM should continue to use the seasonal restriction stipulations for breeding and nesting raptors, which prohibits construction and other activities from occurring between February 1 and September 15. In addition, surface structures requiring a repeated human presence will not be allowed within 825 feet of active raptor nests (ferruginous hawks, 1,200 feet); this distance may vary depending on factors such as nest activity, species, natural topographic barriers, and line-of-sight distances (USDI-BLM, 2013)

Threatened, Endangered, Proposed, and Candidate Species

Black-Footed Ferret, Canada Lynx, Greater Sage-Grouse, Blowout Penstemon, Ute Ladies' Tresses, and North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, and Western Prairie Fringed Orchid*:* The BLM will continue to complete informal conferencing and consultation with the Service for authorized activities that would potentially affect the habitat for these species within the watershed. In addition, habitat and species conservation measures for these species are identified in the RFO RMP BA and BO. Appropriate conservation measures applicable from the BO for blowout penstemon would be added to AMP revisions for the Buzzard and Stone allotments where this plant occurs. Both documents will be adhered to for compliance with the ESA and the BLM Wyoming State Director's Sensitive Species List (BLM Manual 6840). Conservation Measures for the Greater Sage-Grouse, when identified, will be applied to all surface disturbing and disruptive activities, as appropriate. Reasonable and Prudent Measures and Terms and Conditions for the black-footed ferret, Canada lynx, blowout penstemon plant, Ute ladies'-tresses plant, and North Platte River species will be applied to all surface disturbing and disruptive activities, as appropriate (USDI-BLM, 2013).

Additional mitigation measures have been identified for the following species.

Black-footed Ferret: If prairie dog towns or complexes suitable as black-footed ferret habitat are present, attempts will be made to avoid locating surface disturbing activities within 164 feet (50 meters) of a town. If a black-footed ferret non-block cleared town or complex cannot be avoided, then consultation with the WGFD is required (USDI-BLM, 2013).

Greater Sage-Grouse: In general, surface disturbing and disruptive activities will be intensively managed using BMPs applied to surface disturbing and disruptive activities to maintain or enhance grouse and their habitats. Surface disturbing activities or occupancy are prohibited on and within one-quarter mile of the perimeter of an occupied Greater Sage-Grouse lek. Disruptive activities are prohibited between 6:00 p.m. and 9:00 a.m. from March 1 to May 20 on and within ¼-mile of the perimeter of an occupied grouse lek. In nesting and early brood-rearing habitat, project proponents will avoid surface disturbing and disruptive activities, within identified grouse nesting and early brood rearing habitat from March 1 to July 15. Surface disturbing or disruptive activities within grouse breeding or nesting habitat will require the use of BMPs designed to reduce both the direct loss of habitat and disturbance to the birds during the critical breeding and nesting seasons. High-profile structures will only be authorized on a

case-by-case basis from ¼-mile to 1 mile of an occupied grouse lek. Surface disturbing and disruptive activities potentially disruptive to delineated grouse winter concentration areas are prohibited during the period of November 15 to March 14 for the protection of these birds during this sensitive time period (USDI-BLM, 2013). Grazing permit renewals and allotment agreements and plans (AMPs/AMAs) which are revised would to be in conformance with current recommendations for management of Greater Sage-Grouse and their habitat (Greater Sage-Grouse Habitat Management Policy on Wyoming BLM Administered Public Lands) (USDI-BLM, IM No. WY-2012-019 or updated guidance).

BLM State Sensitive Species

***Mammals: Long-eared myotis, fringed myotis, spotted bat, Townsend's big-eared bat, white-tailed prairie dog, Wyoming pocket gopher, pygmy rabbit, swift fox; Birds: loggerhead shrike, sage thrasher, Brewer's sparrow, sage sparrow, white-faced ibis, trumpeter swan, long-billed curlew, bald eagle, Northern goshawk, ferruginous hawk, peregrine falcon, burrowing owl, and mountain plover; and Plants: Cedar Rim thistle, persistent sepal yellowcress, Laramie false sagebrush, and limber pine*:** The BLM will continue to intensively manage surface disturbing and disruptive activities that would potentially affect the habitat of these species on a case-by-case basis. In addition, surface disturbing and disruptive activities will be intensively managed to minimize impacts on identified crucial habitat for sensitive species for the purpose of protecting these species and their associated habitats. Additional mitigation measures have been identified for the following species (USDI-BLM, 2013).

White-tailed Prairie Dog: Surface disturbing and disruptive activities in white-tailed prairie dog towns will be avoided. Motorized vehicle use within white-tailed prairie dog towns is limited to either designated roads and vehicle routes or existing roads and vehicle routes, depending on the landownership pattern in the area of specific white-tailed prairie dog complexes. Prairie dog poisoning is prohibited in white-tailed prairie dog towns and complexes, except for demonstrated reasons of human health and safety. Anti-raptor perching devices will be considered, on a case-by-case basis, for any above-ground facilities within ¼-mile of prairie dog towns. Placement of power poles within prairie dog towns will be avoided; however, in the event that power poles are required to be placed within these towns, raptor anti-perch devices will be required (USDI-BLM, 2013).

Mountain Plover: Surface disturbing and disruptive activities located in potential mountain plover habitat are prohibited during the reproductive period of April 10 to July 10 for the protection of breeding and nesting mountain plover. Additional protection measures will be applied if this area is later determined to be within occupied habitat, which is defined as areas where broods and adults have been found (USDI-BLM, 2013).

Fisheries

1) Characterization

Regionally or Nationally Important Recreational Fisherie:

The types and locations of fisheries within the Great Divide Basin/Ferris and Seminoe Mountains watershed have not changed from the 2003 watershed assessment, and should be referenced in support of this document. The Miracle Mile/Pathfinder and Seminoe Reservoirs continue to be managed by the WGFD and Bureau of Reclamation (BOR) as a trout and walleye fishery. The dune ponds have dried up due to long-term hydrologic drought since the late 1980s and do not support any fish. The man-made ponds at A&M Reservoir and Lost Soldier Reservoir (on state land) are stocked annually with rainbow and brook trout, while Bucklin Reservoir is stocked with perch when water levels

will support a fishery. The small streams around the Ferris and Seminoe Mountains support the most fisheries habitat on public lands that are administered by the RFO. They primarily support brook trout, although the WGFD did stock Colorado River cutthroat trout (CRCT) into Arkansas Creek.

Native Fishes

Table 3: Fish Species Known to Occur or Potentially Occurring in the Analysis Area.

Common Name	Scientific Name	Drainage	Source	Management Status
Bigmouth shiner	*Notropis dorsalis*	SW	Patton et al. (1998)	
Creek chub	*Semotilus atromaculatus*	SW	Patton et al. (1998)	
Fathead minnow	*Pimephales promelas*	SW	Patton et al. (1998)	
Longnose dace	*Rhinichthys cataractae*	SW	Patton et al. (1998)	
Sand shiner	*Notropis stramineus*	SW	Patton et al. (1998)	
Longnose sucker	*Catostomus catostomus*	SW	Patton et al. (1998)	
White sucker	*Catostomus commersoni*	SW	Patton et al. (1998)	
Iowa darter	*Etheostoma exile*	SW	Patton et al. (1998)	
Brook trout	*Salvelinus fontinalis*	ALL	WGFD	
Rainbow trout	*Oncorhynchus mykiss*	PS	WGFD	
Cutthroat trout	*Oncorhynchus clarki*	PS	WGFD	
Brown trout	*Salmo trutta*	PS	WGFD	
Walleye	*Stizostedion vitreum*	PS	WGFD	

SW = Sweetwater, PS = Pathfinder-Seminoe, GD = Great Divide, ALL = Sweetwater, Pathfinder-Seminoe and Great Divide.

Some of the fish listed in Table 3 do not occupy most of the streams on a year round basis. Large flow events connecting these streams to the Sweetwater River occur in low frequencies (~50 year event) due to dewatering for irrigation on private lands. But, the cyprinid (minnow) and catostomid (sucker) fishes have the potential to use these streams during high flow events that coincide with spawning migrations making these streams important in carrying out the life cycles of these fishes.

Amphibians

Northern leopard frog is common in the drainages around the Ferris and Seminoe Mountains. Great Basin spadefoot, and tiger salamanders occur within the Great Divide Basin, with sightings much more common during wetter periods. Boreal toad has the potential to occur in the Ferris and Seminoe Mountains, although there are no known populations.

Table 4:
Special status Amphibian Species Known to Occur or Potentially Occurring in the Analysis Area.

Common Name	Scientific Name	Drainage	Management Status
Boreal Toad	*Bufo boreas boreas*	SW, PS	BLM sensitive
Northern Leopard Frog	*Rana pipiens*	ALL	BLM

			sensitive
Great Basin Spadefoot	*Spea intermontanus*	ALL	

SW = Sweetwater, PS = Pathfinder-Seminoe, GD = Great Divide, ALL = Sweetwater, Pathfinder-Seminoe and Great Divide

2) Issues and Key Questions

The issues and key questions discussed in the 2003 watershed assessment are still valid, including: vegetation (livestock) management, beaver habitat, energy development, transportation planning, and invasive species and disease. Principle changes over the last ten years have been the termination of CBM development in the area and wildfires on Ferris and Seminoe Mountains. This raises the key question of how fast aspen and other woody shrubs will return in order to support beaver colonies?

3) Current Conditions

The Miracle Mile on the North Platte River continues to support a "blue ribbon" trout fishery. The BLM and BOR coordinated to fence off portions of stream bank and plant trees to improve bank stability. The A&M and Lost Solder Creek reservoirs continue to be very productive and well-used fisheries. The A&M Reservoir is within a 120 acre exclosure, which is not grazed, and is used by fishermen, as well as recreationists, along the Continental Divide National Scenic Trail. It is maintained with excess water that is not needed in Bairoil for oil field injection, with the balance running down Lost Soldier Creek, which maintains water levels for that fishery a mile outside Bairoil. The BLM drilled a water well above A&M Reservoir to supplement flows when the oil field wells are being maintained, or in the future if excess water is no longer available; however, a larger pump needs to be installed in the well. The smaller pump would be installed in a water well at the upper end of Lost Soldier Creek to supplement flows in the drainage and potentially support brook trout located in about six miles of stream channel.

The latest broad-scale sampling of fish populations in the Ferris Mountain area occurred in 2007 by the Casper Fish Division of the WGFD, with 29 sampling points conducted between July and October. Brook trout, an introduced species, was discoverd in Cherry, Pete, and Muddy Creek, although only Cherry and Pete Creek have trout biomass greater than 50 pounds per mile. Arkansas and Pole Canyon Creeks were fishless, but appear suitable to support wild salmonid stocks and were recommended for further investigation for fisheries development. Whiskey Creek was also fishless even though it supported brook trout in 1985. The stream reach sampled is currently not PFC, although lower sections on private and state lands are in better condition. The only native non-game fish species located was longnose dace on lower Pete Creek. The highest numbers of trout per mile and pounds of fish per mile were on the upper reaches of Cherry Creek with 3,432 and 3,297 trout per mile, and 164 and 137 pounds of fish per mile respectively. Three sites on Pete Creek ranged from 2,243 to 2,912 trout per mile and 67 to 117 pounds of fish per mile respectively. Two sites on Pete Creek had brook trout populations that had increased significantly, in the middle section where livestock management had been changed from summer long grazing to short duration fall grazing. At the lowest downstream station, brook trout numbers increased from 158 per mile in 2002 to 1,355 per mile in 2007. At a second site sampling in 1997 estimated 1,337 trout per mile which increased to 2,912 trout per mile in 2007.

Fisheries habitat is improving as livestock management in riparian habitat improves and streams achieve proper functioning condition. The most successful of these is the middle portion of Pete Creek, which supports an expanding beaver population in a willow/waterbirch riparian habitat. The water storage and deeper pool habitat created by beaver are maintaining fish populations through drought periods and produce larger fish. The woody habitat along Cherry Creek is expanding, but there are no beaver present to enhance the fisheries habitat as opposed to Pete Creek. Much of Sand Creek was affected by the 2012 Ferris Mountain wildfire; however, the brook trout population survived and have moved up into stream habitat affected by the fire. The CRCT recently stocked into Arkansas Creek are still present

(2013 BLM observation). Fish habitat in the high gradient portions of these streams is lacking deeper water pool habitat to survive both summer and winter conditions. Muddy Creek, on the southwest side of Ferris Mountain, also supports brook trout along the headwater reach; however, diversions below for irrigated hay meadows prevent it from supporting a fishery. There is also a WGFD walk-in area for the Raymond Ranch reservoir, which is stocked with trout.

The most visible amphibian observed in the Ferris Mountain area is the northern leopard frog, seen along all of the stream drainages. Tiger salamanders are more visible during wet periods, although young salamanders and frog tadpoles are often observed in irrigation ditches associated with Cherry and Pete Creeks. Recent surveys were conducted by the BLM in 2009 and 2010, and WYNDD (contract) in 2011. All surveys included both visual observations and night calling. Tiger salamanders were observed throughout the watershed, while northern leopard frogs were located around Ferris Mountain. Great Basin spadefoot toads were observed along Lost Creek and a reservoir north of Wamsutter, and woodhouse toads were observed in the Sand Creek drainage on the east side of Ferris Mountain. The BLM personnel have observed both species of toads in the wetland habitat on the south side of Bear Mountain (just east of Ferris Mountain), although whether the spadefoot was the Plains or Great Basin species is unknown. The WYNDD survey was within the Ferris Mountain WSA on Cherry, Muddy and Pete Creeks, with only northern leopard frogs located. Although there is potential for boreal toad to occur in this area above 7,500 feet in elevation, there have not been any sightings to date. Other reptiles observed during the 2007 fish sampling included prairie rattlesnakes and garter snakes.

4) Reference Conditions

References to historical stream conditions are limited; please refer to the 2003 watershed assessment for historical accounts of stream habitat conditions. No trout species are native to the analysis area.

5) Synthesis and Interpretation

The discussion for Standard 2, Riparian/Wetland Health, also applies in most cases to fisheries, although fisheries habitat often requires a higher degree of management than a riparian-grassland habitat. Livestock grazing is the principle factor affecting fisheries habitat. Changing the season of use, and/or shortening the duration of use, are the best methods for improving riparian habitat for fish. As streams improve in vegetative health and channel narrowing, water flows improve and temperatures are kept lower. Off-site water development and better use of upland salt/mineral supplements can also aid in the improvement by reducing the dependence of livestock upon and time spent along streams. The other factors that need to be addressed are vegetation treatments to restore aspen woodland and riparian shrubland habitat, and the lack of beaver. The burns that have recently occurred will help restore aspen and riparian habitat on the east end of Ferris Mountain, but additional burns are still needed, particularly in the headwaters of Cherry, Muddy and Pete Creeks. The lack of beaver starts with habitat improvement and the above mentioned vegetation treatments and livestock management. However, beaver could be reintroduced into Cherry Creek, where there is suitable waterbirch to support them. Restoring beaver and the habitat they create would have the greatest beneficial effect on fisheries habitat in the watershed. With the lack of beaver, small rock and log dams/overpours (in conifer cutting areas) could be created to improve pool habitat on any of these small streams. These were recently created on Cherry Creek as part of an Eagle Scout project, and could also be developed with fishermen groups, WCC crews, or other interested parties.

Baseline inventory information is still lacking for native fish and amphibians species in spots within the analysis area. Coordination with the WGFD, additional contracts, and surveys by BLM staff need to be

pursued to reduce or eliminate these data gaps, even though more information is known currently compared to ten years ago.

6) Recommendations

The improved management of riparian habitats through the use of grazing BMPs indicate both an upward trend and meeting Standard #4 for fisheries in some of the streams in the assessment area. However, other sites that should support fisheries, currently do not. Standard #4 for fisheries is not being met on streams, which currently fail Standard #2 – Riparian/Wetland Health and have the potential to support fish populations. There are also sites that are rated in proper functioning condition, but due to the lack of overhead cover (stream shading) exceed temperature requirements for some fish species and will not support them. However, these sites have not yet been defined. Due to the lack of credible data on the status of native fishes in the Seminoe Mountain portion of this watershed, it is unknown whether Standard #4 is being met for these species.

Completing additional inventories for native fishes and native amphibians, including boreal toad, should be a high priority for the fisheries program in coming years, in order to identify site-specific land management opportunities.

Vegetation and Livestock Management

In areas not meeting Standard 2, implement allotment management plans that will provide the management necessary to ensure adequate watershed protection under grazing use to perpetuate vegetation, enhance woody plant vigor, and assure soil stability. In all allotments with fisheries (or the potential to support them), include objectives to enhance these habitats, including but not limited to off-site water development. In allotments containing portions of the Miracle Mile, implement grazing management strategies that reflect the importance of this fishery, both locally and nationally. Implement treatments, including prescribed fires and managed natural ignitions, in conjunction with grazing management, within forested areas to increase the regeneration of aspen stands. Planting of willows, dogwood, and other shrubs in riparian habitat should occur to improve bank stability and stream shading, and consider planting aspen in areas they were historically located but are currently absent. Coordinate with WGFD to transplant beaver into suitable habitat. Construct rock and/or log structures to improve pool habitat for fisheries. Complete installation of the new pump to supply water to A&M Reservoir and transfer from smaller pump to the adjacent well to supply water into Lost Soldier Creek. Add additional rock rip-rap to the dam face of A&M Reservoir.

The recommendations for energy development and transportation planning would remain the same as the 2003 watershed assessment, although currently these factors have minimal impacts on fisheries habitat.

Avoiding the translocation of invasive species to new habitats should be considered a high priority for the RFO. As the distribution of invasive species is not fully known, disinfecting equipment and materials that have been used in riparian or wetland environments should be considered standard precautions. All programs should use the chlorine bath maintained by the fisheries crew for disinfecting their equipment and materials before they are used in a new location (IM No. WY-030-99-007 outlines required disinfection procedures for the RFO).

Weeds

1) Characterization

Weeds, or invasive non-native plants, threaten natural ecosystems and greatly impact natural plant communities throughout the West. These invaders can reduce biodiversity, affect threatened and endangered species, change habitats and natural plant/animal associations, and prevent native species from remaining or encroaching upon a site. Unlike many areas of the West, overall the RFO has a comparatively smaller weed problem than other areas in the Rocky Mountain region. The analysis area is relatively noxious weed free, with small problem areas. Within the analysis area, weed species are predominantly found along roadways and other disturbed areas associated with energy development, recreational use, and livestock grazing activities. Road building, development, grazing, fire suppression, and other activities can directly increase weed establishment and/or maintain their presence within the ecosystem.

The main noxious species present within the area are Dalmatian toadflax, diffuse knapweed, Russian knapweed, Canada thistle, and whitetop. Other noxious species include saltcedar, Russian olive, perennial pepperweed, Scotch thistle, spotted knapweed, burdock, and leafy spurge. There are also several invasive species present which are normally restricted to disturbed areas. These include halogeton, Russian thistle, henbane, cheatgrass, and several annual mustards. Most invasive species are not treated unless they are interfering with reclamation of disturbances, or are a fire hazard around well locations. Some noxious weeds, such as whitetop and Canada thistle, are treated or not on a case-by-case basis.

2) Issues and Key Questions

As new disturbances are continually being created, the area is seeing an expansion of some of these species. Current issues in the assessment area follow:

- Noxious weeds and invasive species are spreading into undisturbed rangeland from the initial sites of introduction along many roadsides, well pads, pipelines, livestock water developments, and other disturbed areas.
- Adequate mitigation measures are in place to address weed control on disturbed areas; however, enforcement of existing stipulations still needs improvement.
- The BOR is not conducting any weed treatments on lands withdrawn from the BLM.
- Some private landowners adjacent to BLM lands have yet to implement noxious weed management programs, thereby negating some of the potential effectiveness of treatments on BLM lands.
- Historically large populations of wild horses (prior to 2006), combined with ongoing conversions from sheep to cattle grazing, have affected the condition of native rangelands, making them more susceptible to invasion by weed species.
- Where recreation is a factor in weed establishment and spread, measures frequently are not being taken to address this issue.
- There are no reasonable measures available to control wildlife movements that spread weeds.

3) Current Conditions

Weed locations are primarily restricted to disturbed areas associated with oil and gas development, recreational use, and livestock grazing activities, such as water developments. Some noxious weed

locations associated with manmade disturbances are being treated either by lease/Right-of-Way (ROW) holders, County Weed and Pest personnel, or the BLM. There are only a few areas where the noxious weeds are spread throughout native rangeland. Some of these areas are being treated to contain the weeds where they are. A goal is to avoid their spread by vehicle, equipment, or animal movements. Most federal, state, and county improved roads are being treated for weeds. Continued oil and gas activity will result in the expansion of some of these species as development-related disturbance continues.

Dalmatian toadflax occurs in two areas. One area is directly north of and adjacent to Rawlins (on private land and BLM) along Highway 287, which is being treated and has been reduced from the 2003 assessment. The other is northeast of Seminoe Reservoir on withdrawn BLM lands managed by the BOR, which has had no chemical treatment. The University of Wyoming and the BLM released a biological control agent (toadflax stem mining weevil, *Mecinus janthinus*) in this large infested area in 2005-2008. The insects are surviving and expanding, except where the wildfire burned in 2012. No insects were located in the burned areas in 2013. The toadflax is still expanding. Five acres here are at risk of infestation, but still meet the standard currently. There are small spot infestations starting along the roads from vehicles spreading the seed, and in undisturbed rangeland from animals redistributing seed.

Diffuse knapweed occurs around Seminoe and Kortes Reservoirs on BLM land, and on withdrawn BLM lands managed by the BOR, and have had mechanical and some chemical treatment. It was originally introduced during construction of a high-voltage power line and is being spread mostly by vehicles along roads in the area. Patches are being treated as they are found.

Russian knapweed is found in many places throughout the assessment area. Hay Reservoir had a rather large infested area of about 1400 acres, which was spreading slowly. The area started receiving treatments by the private landowner and the BLM in 2009, and now contains only small patches scattered about the original area. There are approximately 115 acres of BLM lands not meeting standards on the southwest side of the Ferris Mountains (Ferris Mountain allotment). The infestations are slowly expanding, and are not currently being treated. The majority of the knapweed (>500 acres) is on private lands along roads and hay meadows/irrigation ditches presents a continuing risk of infesting BLM lands. The Muddy Creek Pasture allotment has approximately 20 acres infested, which is not currently being treated and therefore is not meeting standards. Another area is in Bell Springs Allotment which is not presently being treated and is still slowly expanding, partly in response to a gravel pit and road. Fifteen acres here are not meeting the standard. There are scattered small patches around Muddy Gap, which are being treated as they are located on BLM lands. There are also small areas all along the Seminoe Road, which are being treated, with the exception of the Morgan Creek Drainage. The area along Miracle Mile is infested, below Kortes Reservoir on withdrawn BLM lands managed by the BOR, and is not being treated. It poses a risk to adjacent BLM lands, as the seed is being spread by vehicles, water, and animals. Total acres not meeting this standard are approximately 150.

Whitetop occurs along roads and other disturbed areas throughout the analysis area. Most areas are not treated.

Other noxious species present in the analysis area are:

a) Saltcedar occurs in some borrow areas along the Interstate and isolated patches scattered throughout the analysis area. Isolated patches are treated as found. Saltcedar also occurs around Seminoe and Pathfinder Reservoirs on withdrawn BLM properties managed by the BOR, and are not currently being treated.

b) Russian olive is treated as found. Recently treated areas are Lost Soldier Creek near Bairoil and Muddy Creek near Muddy Gap.

c) Canada thistle occurs in and along riparian habitat, and in some cases along roads where runoff water accumulates. As long as the riparian habitat is being properly managed, Canada thistle is not expanding and occupies the niche between the riparian and upland habitats. Areas burned by the Ferris and Seminoe wildfires in 2012 have seen a dramatic increase along the riparian areas. These will be monitored to see if the density reduces as native plants recover from the fire and increased sediment loads are being moved down the drainages. Canada thistle basically occurs throughout the assessment area and is treated along most main roads.

d) Scotch thistle was documented in the Mahoney Dome field, is currently restricted to disturbed areas on well pads and pipelines, and is being treated.

e) Spotted knapweed occurs in two places above Seminoe and Kortes Reservoirs on BLM lands and BLM withdrawn lands managed by the BOR. These patches have had mechanical and limited chemical treatment by the BLM. The knapweed was originally introduced during construction of a high-voltage power line and is being controlled. The second location is along the main road and is also being controlled.

f) Burdock has been documented on BLM lands within the Ferris Mountain wildfire perimeter. Previously it was only known on private lands, but it has moved downstream with increased runoff associated with the burned areas. The patches will need to be treated to prevent expansion.

g) Leafy spurge is known to occur in the Muddy Gap area and is being treated where located. Wildlife are the main agent causing its spread and are carrying it up into and around the Ferris Mountain Wilderness Study Area and towards Green Mountain. Spurge is commonly observed along draws and taller shrub patches in small amounts of an acre or less in size. Altogether there are an estimated 700 acres of leafy spurge scattered across 3,000 acres on the southwest side of the Ferris Mountains that are being controlled.

The invasive species of concern are halogeton, black henbane, and cheatgrass. Other invasive species include Russian thistle, and several annual mustards. Halogeton is widespread throughout the oil and gas areas, lining roadways and pipelines and, in some cases, dominating inadequately reclaimed sites. It is also invading nearby native rangelands on shale and saline upland sites from untreated oil and gas disturbances. Halogeton is poisonous and has caused sheep losses every year in the assessment area. Although it is a stipulation on oil and gas Applications for Permit to Drill and ROWs to control weed species, in many cases this is not occurring. Black henbane is also poisonous and can expand rapidly in disturbed areas, so it is targeted for treatment. Cheatgrass occurs sporadically throughout the assessment area. Disturbed areas along roads, corrals and salt blocks are common locations. However, it can also be observed on rangelands on well-drained, disturbed soils, particularly on south and west facing slopes. The majority of the 2012 Ferris and Seminoe wildfire areas were treated for cheatgrass to ensure the fires would not spread the weed. Areas not treated (within a buffer zone around riparian areas and blowout penstemon occupied habitat) are being inventoried and monitored to watch for expansion. Russian thistle occurs along disturbed roadsides throughout the area on well-drained, disturbed soils. Most invasive species are not treated unless they are interfering with reclamation of disturbances or are a fire hazard around well locations.

4) Reference Conditions

Please refer to the conditions discussed in the 2003 watershed report.

5) Synthesis and Interpretation:

The highest priorities for treatment are the aggressive noxious weed species, such as the knapweeds, saltcedar, and leafy spurge, which are able to spread throughout stable native plant communities. These are promptly treated and monitored, and are not specifically related to livestock grazing. Where livestock grazing is contributing to the invasion or expansion of weed species, management must be adjusted.

Due to the BLM's multiple use philosophy, oil and gas development will continue to occur, providing increased disturbance areas for additional weed establishment. Mitigation practices to control these weeds will continue to be necessary. In addition, the presence of roads and their associated use and maintenance will also continue to provide additional infestation sites. Some annual weed species are initially beneficial in terms of providing cover on reclaimed pads and pipelines that trap snow, reduce runoff, and shade young perennial plants. However, these species should not continue to be the dominant species several years after reclamation has occurred.

A significant portion of the watershed has not been inventoried for weeds, but it is generally assumed that, unless there are disturbances, there probably are not any weedy species present. The exceptions are where noxious weeds are already established in an area, and buffer zone inventories around the patches are not complete. Most invasive species are not treated unless they are interfering with reclamation of the disturbance. As native vegetation is reestablished, many of the invasive species will be crowded out. The species of long-term concern within the assessment area are the noxious species and halogeton.

Weed treatments and inventory have been ongoing as funding allows, and are partnered with landowners wherever possible to spread treatments out and treat entire infested acreages, rather than just portions of BLM lands. The Wyoming Landscape Conservation Initiative (WLCI) has been a large partner in getting leafy spurge (at Muddy Gap since 2007) and Russian knapweed (at Hay Reservoir since 2009) treated and under control. Without those dollars and those of the private landowners, the weeds would be much worse.

6) Recommendations

Due to the existing good condition of native vegetation and the weed treatment program in place to control and/or eradicate identified weed problem areas, it is determined that the majority of the watershed is meeting Standard #4 with respect to weeds. There are known areas of noxious weeds that are rapidly expanding and are not being treated. These areas affect approximately 400 acres, but are not due to livestock grazing management. The following recommendations, in addition to following the Rawlins Weed Prevention Plan (BLM, 1999), would expand upon the success already achieved and help meet desired resource conditions in the future.

Continue inventory and treatment efforts in the area to identify and contain or eradicate noxious weeds. Continue to work with ROW/lease holders in their treatment of weedy species, as well as work with landowners on concurrent treatments with private lands. Enforcement of stipulations on APDs/ROWs to control weeds must occur.

Re-initiate contact with BOR personnel to encourage weed treatment on BOR withdrawn lands, especially where the weeds are putting BLM managed lands at direct risk of invasion.

Identify all weed species that need to be treated throughout the assessment area. Although some may not be a major focus for treatment, they can be a significant problem within localized areas.

Address road maintenance equipment movement procedures to address the spread of noxious weeds from/to other areas. Procedures, such as cleaning equipment, from one site to the next, minimizing disturbance of native vegetation, and prompt reseeding after construction are important.

Continue to support a certified weed-free hay program for those recreational and livestock grazing users that bring in livestock and hay from other areas. In addition, there may be a need to address livestock movement from pasture to pasture to curtail weed spread within an allotment. There may also be a need to monitor livestock shipped into the area from other states; a potential source of noxious weed introductions.

Continue to support a certified weed-free seed and mulch program for reclamation of disturbed lands.

STANDARD 5 – WATER QUALITY

Water quality meets state standards.

1) Characterization

The state of Wyoming determines water quality status, and the BLM works with state agencies to correct identified issues regarding water quality where they occur on the BLM-Administered public lands. The Great Divide Basin has no external outlets, so that either point or non-point pollution sources will mostly have a local effect. Waters in this basin are primarily designated Class 3B waters by the state of Wyoming. The North Platte River drainage supports both fisheries populations and municipal water sources; and therefore, is a higher management concern. The Miracle Mile is designated as a Class 1 water, while Pathfinder and Seminoe Reservoirs are designated as Class 2AB waters by the State of Wyoming.

2) Issues and Key Questions

The issues and key questions are similar to those described in the 2003 watershed assessment, except for the new uranium development at Lost Creek in the Great Divide Basin. This project will use In-Situ Recovery (ISR) to remove underground uranium with minimal surface disturbance. The Environmental Impact Statement stated that the quality of ground water would not be affected by the ISR process due to soil layers that restrict water movement; however, fluctuations in water levels in adjacent water wells may occur. The key question is: If ground water levels in adjacent water wells could be affected by the ISR process, then why wouldn't water quality be affected, and how will this affect the livestock, wildlife and wild horses which drink from these water wells?

3) Current Conditions

There are currently no waters listed as impaired by the state of Wyoming within the Great Divide Basin/Ferris and Seminoe Mountains watershed. Indirect indicators of water quality include upland and riparian monitoring, including photo-points, transects, and personal observations. The trends described under Standard 1 and 2, in terms of reduced bare ground and improved vegetation cover and bank stability along streams, reflect in improving conditions for water quality as well. Reduced stream width

also relates to cooler water temperatures, increased oxygen levels, and improved macro-invertebrates in these streams.

4) Reference Conditions

Refer to the reference conditions discussed in the 2003 watershed report.

5) Synthesis and Interpretation

Although there are no current or past impaired water bodies within the assessment area, indirect indicators of water quality issues should still be identified, monitored and corrected. Livestock grazing, energy development, excess wild horse populations, off-road vehicle use and other human practices contribute to non-point pollution. The current trends discussed in the earlier Standards all reflect on reducing the potential for water quality issues. The fencing of seeps, off-site water development, and improved livestock management in riparian/wetland habitat have likely improved water quality. Continued coordination with the conservation districts and additional monitoring of water quality metrics including macro-invertebrates should be pursued.

Water quality also includes or is affected by the quantity of water involved. It is likely that the recent wildfires and prescribed burns may increase stream flows, and monitoring would be warranted to detect any trends in stream flows. However, with the removal of dense conifers and recovery by aspen and herbaceous vegetation, increased water flows should occur that will also enhance water quality. Future use of fire on Ferris Mountain in the Cherry and Pete Creek drainages (and others) should also lead to increased water yield and quality in streams below. In the longer term, aspen recovery and beaver transplants and pond creation should also improve water storage and water quality in many of the streams in the Ferris and Seminoe Mountains area.

6) Recommendations

Within the Great Divide Basin/Ferris and Seminoe Mountains assessment area, the state of Wyoming has not identified any water quality impairment. The BLM will continue to implement or refine BMPs for livestock grazing, which promote perennial vegetation to stabilize stream banks and improve cover and litter on uplands. Season and duration of use are the principle factors in considering management changes to address this standard, although off-site water development may reduce livestock dependence on watering at streams resulting in bank sloughing and wider channels.

Identify and correct existing road problems that alter surface water flows and result in accelerated erosion. Incorporate measures into new projects and environmental assessments, which will mitigate alterations to surface water flows.

The numbers of wild horses in the assessment area must be maintained at AML. Off-site water development should be pursued in the Lost Soldier Creek drainage to reduce channel impacts from both livestock and wild horses that would improve water quality and fisheries habitat.

Promote mixed-age shrub and woodland communities with higher proportions of young and middle-aged stands, which have greater amounts of herbaceous cover to reduce runoff and soil erosion and increase infiltration and ground water recharge. Promote vegetation treatments, including prescribed burns and managed natural ignitions, to increase early seral plant communities, such as aspen woodland, to enhance water flows in streams. Support reintroduction of beaver into streams with adequate woody habitat, to improve water storage and late season release of water to augment stream flows.

STANDARD 6 – AIR QUALITY

Air quality meets state standards.

1) Characterization

The closest and most current air quality information (since 2003 watershed assessment) is obtained from the CD-C Project Area centered at Wamsutter. An EIS is being completed for continued/expansion of natural gas development in this area, with excerpts of the affected environment section incorporated into this document.

Regional air quality is influenced by a combination of factors including climate, meteorology, the magnitude and spatial distribution of local and regional air pollution sources, and the chemical properties of emitted pollutants. The CD-C Project Area is located in a semiarid (dry and cold), mid-continental climate regime. The area is typified by dry, windy conditions with limited rainfall and long, cold winters. The nearest meteorological measurements were collected at Wamsutter, Wyoming (1897-2012), located near the center of the project area at an elevation of 6,800 feet above mean sea level.

The annual average total precipitation at Wamsutter is 7.1 inches, with annual totals ranging from 3.8 inches (1979) to 13.6 inches (1983). Precipitation is greatest from spring to summer, tapering off during the fall and winter months. The region has cool temperatures, with average temperature (in degrees Fahrenheit [˚F]) ranging between 7.1˚F and 28.6˚F in January to between 48.9˚F and 84.5˚F in July. The frost free period generally occurs from May to September.

The CD-C project area is subject to strong and gusty winds, often accompanied by snow during the winter months, producing blizzard conditions and drifting snow. The closest comprehensive wind measurements were collected in the project area at the Wyoming Department of Environmental Quality meteorological monitoring station located approximately 2 miles northwest of Wamsutter. From the data collected it is evident that the winds originate from the west to southwest nearly 36 percent of the time and from the south to southeast over 37 percent of the time. The frequency and strength of winds greatly affect the transport and dispersion of air pollutants. The annual mean wind speed is 11.4 miles per hour (mph), and that relatively high average wind speed indicates the presence of good dispersion and mixing of any potential pollutant emissions resulting from the CD-C project sources.

2) Issues and Key Questions

Although much of the discussion in the 2003 watershed assessment is still valid and should be reviewed, a few factors have changed over the last 10 years that led to new and valid questions. With the near doubling of road acres west of Highway 789 (and obviously additional miles as part of the Atlantic Rim natural gas project, what effects does dust from roads have on reducing plant growth or palatability, and the habitat these plants provide for insects, birds, and other wildlife? With the Atlantic Rim natural gas project, what levels of methane are escaping collection and being released to the atmosphere through methane seeps without production occurring versus that observed at much higher levels with initial production and do these areas need to be fenced off to protect the public or animals in the area? (Standard #6 – page 1 photo).

3) Current Conditions

Monitoring of air pollutant concentrations has been conducted within both the CD-C Project Area and at the cumulative study area. The study area encompasses five Prevention of Significant Deterioration (PSD) Class I areas and three sensitive Class II areas. The five Class I areas are located within the CD-C cumulative study area are the Bridger, Fitzpatrick, Mount Zirkel, Savage Run and Rawah Wilderness

Areas, and the three sensitive Class II areas are; the Popo Agie Wilderness Area, Dinosaur National Monument, and Wind River Roadless Area. Air pollutants monitored at these sites include carbon monoxide (CO) , nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns in effective diameter (PM_{10}), particulate matter less than 2.5 microns in effective diameter ($PM_{2.5}$), and sulfur dioxide (SO_2). Background concentrations of these pollutants define ambient air concentrations in the region and establish existing compliance with ambient air quality standards. Air quality related values (AQRVs), such as visibility, atmospheric deposition, and the change in water chemistry associated with atmospheric deposition at acid sensitive lakes, have been identified as a concern at several Class I and sensitive Class II areas within the study area. Visibility for the region is considered to be very good. Atmospheric deposition refers to the processes by which air pollutants are removed from the atmosphere and deposited onto terrestrial and aquatic ecosystems.

The Prevention of Significant Deterioration (PSD) Program is designed to limit the incremental increase of specific air pollutant concentrations above a legally defined baseline level. Incremental increases in PSD Class I areas are strictly limited, while increases allowed in Class II areas are less strict. Through the PSD program Class I areas are protected by Federal Land Managers (FLMs) by management of air quality related values (AQRVs), such as visibility, aquatic ecosystems, flora, fauna, etc. The 1977 Clean Air Act amendments established visibility as an AQRV that Federal land managers must consider. The 1990 Clean Air Act amendments contained a goal of improving visibility within PSD Class I areas. The Regional Haze Rule finalized in 1999 requires the states, in coordination with federal agencies and other interested parties, to develop and implement air quality protection plans to reduce the pollution that causes visibility impairment.

4) Reference Conditions

Please refer to the current conditions discussed in the 2003 watershed report.

5) Synthesis and Interpretation:

The Clean Air Act as amended requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered to endanger public health and the environment. The NAAQS prescribe limits on ambient levels of these pollutants in order to protect public health, including the health of sensitive groups. The EPA has developed NAAQS for six criteria pollutants: NO_2, CO, SO_2, PM_{10}, $PM_{2.5,}$ O_3, and lead. Lead emissions from CD-C project sources are negligible, and therefore, the lead NAAQS is not addressed in this analysis. States typically adopt the NAAQS but may also develop state-specific ambient air quality standards for certain pollutants.

The CD-C Project Area lies entirely within eastern Sweetwater County and western Carbon County in Wyoming; this area is part of the State of Wyoming's Concentrated Development Area and is therefore subject to CDA restrictions on emissions set forth in the WDEQ-AQD's March 2010 "Oil and Gas Production Facilities Chapter 6, Section 2 Permitting Guidance" (WDEQ-AQD, 2010). The Guidance states, "…all new or modified sources or facilities which may generate regulated air emissions shall be permitted prior to start up or modification and Best Available Control Technology (BACT) shall be applied to reduce or eliminate emissions". The Guidance establishes presumptive BACT requirements for emissions from the following source categories for new facilities, affecting tank flashing, dehydration units, pneumatic pumps, pneumatic controllers, well completions, produced water tanks, blow down/venting, and other sources of pollutants.

In addition, the trends in reducing bare ground observed over the last forty years need to be continued or maintained. Greater plant cover and litter help protect soil function and stability, resulting in less

bare ground or soil particles that are available to add dust to the atmosphere during wind and storm events.

The U.S. Supreme Court ruled in 2007 that EPA has the authority to regulate greenhouse gases (GHGs) such as methane (CH_4) and carbon dioxide (CO_2) as air pollutants under the Clean Air Act as amended; however, there are currently no ambient air quality standards for GHGs, nor are there currently any emissions limits on GHGs that would apply to sources developed in oil and gas activities. Both the exploration/construction and production phases of energy development will cause emissions of GHGs. Methane comprises much of the chemical composition of natural gas, and nitrous oxide, CO_2 and methane are emitted by engines used for drill rigs, compressor engines, etc. Methane is also emitted from grazing animals through belching and excrement bodily functions.

6) Recommendations

Within this assessment area there is no air quality criteria pollutant non-attainment areas for either state for federal standards as determined by the Wyoming Department of Environmental Quality-Air Quality Division. Due to prevailing winds and limited pollution within the general area, overall air quality meets this Standard.

BLM will continue to work with energy companies, livestock permittees and other partners to utilize BMPs for oil and gas development, livestock grazing, and off-road vehicle use to maintain or improve air quality conditions across this watershed. Continue to implement mitigation measures on new oil and gas development operations, while attempting to resolve existing issues. Dust abatement due to vehicle traffic is an important concern, both on a resource basis and a public safely basis. Collect information about methane releases through seeps and determine if those volumes change with future natural gas production from coal beds.

Continue to implement prescribed burning and other vegetation treatment projects to provide for fuel breaks to ensure catastrophic wildfires do not occur. Treatments would greatly reduce the risk of large amounts of particulate matter in the air from larger, landscaped wildfires.

SUMMARY

Standard 1 – Watershed Health

Due to the existing diversity and amount of vegetative cover on uplands and declining levels of bare ground, the stable channels and improving trend in stream vegetation, the livestock management that provides for plant growth to maintain cover and vigor, the management responsibility by industry and agencies to design and mitigate impacts from roads on hydrologic flow events and soil erosion, the rest from grazing for most of the Ferris Mountain wildfire (and late season deferment on the rest of it) to promote plant recovery, and the generally small number of management issues that need to be dealt with, it is determined that the four watershed areas described within the Great Divide Basin/Ferris and Seminoe Mountains assessment report are meeting Standard #1.

Standard 2 – Riparian/Wetland Health

There has been continued improvement in riparian/wetland condition within the assessment area over the last ten years, considering that management of riparian habitat only started about 25 years ago. Although PFC may have been reached in most areas, there will likely continue to be improvements in channel width, bank stability, and desired species, such as like willows and sedges. However, there are still some specific areas that need improvement and others that will just take more time to reach a desired future condition. Five allotments previously failing this Standard are not meeting it, and three other allotments listed below have improved with just very short stream reaches or seeps left to still meet PFC. Allotments containing riparian/wetland habitat that do not meet this standard have been previously described and include: Buzzard (2 miles), Cherry Creek (1/4 mile), Ferris Mountain (.10 mile), and Seminoe (1/4 miles). The seeps within Battle Springs Flats warrant continued monitoring for both wild horse and livestock use and impact.

Standard 3 – Upland Plant Health

Due to the diversity, vigor, productivity, high native species composition, the current trends documented or observed in plant communities, the current livestock management, current wildlife populations and wild horse numbers, and management responsibility shared and demonstrated by the various agencies, industry, and agricultural businesses in the watershed, it is determined that the majority of upland vegetation in the Great Divide Basin/Ferris and Seminoe Mountains watershed is meeting Standard #3 – Upland Plant Health, with the following exceptions. Aspen stands, although healthier than they appeared 10 years ago, still do not meet the standard for vegetation health due to their reduced acreage (compared to historical), competition from conifer encroachment, and concerns over persistence of disease and general clone health within the plant community. Conifer encroachment into shrub stands, long-term lack of fire, and the disease and decadence within the conifers in terms of white pine blister rust, mistletoe, and the mountain pine beetle epidemic are still affecting upland plant health on the Ferris and Seminoe Mountains. Total acreage of areas not meeting this standard previously was approximately 24,000 acres within the watershed. The recent wildfires and prescribed burns have reduced this number down to about 20,000 acres that still need some form of treatment to improve upland plant health. Livestock grazing is a component in the management scenario of these plant communities, but it is not the principle factor in non-attainment of this Standard.

Standard 4 – Wildlife/Threatened and Endangered Species/Fisheries Habitat, Weeds

It is determined that the majority of the Great Divide Basin assessment area is meeting Standard #4 with respect to wildlife, due to the existing good condition of native vegetation and its ability to support the diverse wildlife populations. The principal area deemed not to be meeting Standard #4 for wildlife habitat is the central and western portions of Ferris Mountain, about 20,000 acres, due to loss of aspen

habitat and the disease, decadence, and encroachment of conifers into shrubland and riparian habitats. Habitat needed to support healthy wildlife populations and listed or proposed threatened and endangered species is generally in acceptable condition; however, this does not mean that there aren't problems or concerns about wildlife habitat. The discussion under Standard #2 – Wetland/Riparian Health and Standard #3 – Upland Plant Health outlines the current conditions and recommendations for improving management of these resources. It has been determined that livestock grazing is not a principle factor in the non-attainment of this standard.

The improved management of riparian habitats through the use of grazing BMPs indicates both an upward trend and meeting Standard #4 for fisheries in some of the streams in the assessment area. However, other sites that should support fisheries currently do not. Standard #4 for fisheries is not being met on streams, which currently fail Standard #2 – Riparian/Wetland Health and have the potential to support fish populations. There are also sites that are rated in proper functioning condition, but due to the lack of overhead cover (stream shading) exceed temperature requirements for some fish species and won't support them. However, these sites have not yet been defined. Due to the lack of credible data on the status of native fishes in the Seminoe Mountain portion of this watershed, whether Standard #4 is being met for these species is unknown.

Due to the existing good condition of native vegetation and the weed treatment program in place to control and/or eradicate identified weed problem areas, it is determined that the majority of the watershed is meeting Standard #4 with respect to weeds. There are known areas of noxious weeds that are rapidly expanding and are not being treated. These areas affect approximately 400 acres, but are not due to livestock grazing management. Areas of known Russian knapweed infestations that are not being treated on public land include the southwest side of the Ferris Mountains, an area within the Bell Springs Allotment, and about 40 acres near the Bennett Peak WSA.

Standard 5 – Water Quality

Within the assessment area, water quality impairment has not been identified by the State of Wyoming pertaining to the 303(d) list of impaired water bodies.

Standard 6 – Air Quality

Within the assessment area, there are no air quality criteria pollutant non-attainment areas for either state or federal standards as determined by the Wyoming DEQ. Due to prevailing winds and limited pollution within the general area, overall air quality meets this Standard.

Allotments Described in this Report That Do Not Meet Standards Due to Livestock Grazing:

Buzzard allotment	Standard 2, 4 – Riparian/Wetland, Fisheries Habitat
Cherry Creek allotment	Standard 2, 4 – Riparian/Wetland, Fisheries Habitat
Ferris Mountain allotment	Standard 2, 4 – Riparian/Wetland, Fisheries Habitat
Seminoe allotment	Standard 2 – Riparian/Wetland

Areas Described in this Report That Do Not Meet Standards Due to Other Causes:

Ferris and Seminoe Mountain Area	Standard 3 – Upland Plant Health
Central and West Ferris Mountain	Standard 4 – Wildlife Habitat
Ferris Mountain-Southwest Side	Standard 4 – Weeds
Bell Springs Russian Knapweed	Standard 4 - Weeds

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EXHIBIT "A"

ALLOTMENT #	ALLOTMENT NAME	AUTHORIZATION #	OPERATOR NAME	AUM'S
00605	DALEY RANCH			959
00701	BELL SPRINGS	4903092	STEWART CREEK LLC	346
00705	RED DESERT ALLOTMENT	4903083	STRATTON SHEEP COMPANY	1960
00706	G.L.	4903035	HAY RANCH LIMITED PARTNERSHIP	1,268
00707	HAYSTACK	4915579	PBR PROPERTIES, LLC	4,209
00709	JAWBONE	4903092	STEWART CREEK, LLC	1326
00710	MONUMENT DRAW	4903016	FILL-MORE BEEF, LLC	1,634
00711	MONUMENT LAKE	4903083	STRATTON SHEEP COMPANY	6327
00713	NORTH CRESTON-WEST	4903096	THAYER BRUCE	1,178
00714	LATHAM	4903065	P. H. LIVESTOCK COMPANY	1,782
00715	NORTH TIPTON	4903072	ROCK SPRINGS GRAZING ASSOCIATION	1,334
00716	NORTH WAMSUTTER	4903070	P. H. LIVESTOCK COMPANY	2,935
00717	RUBY KNOLLS	4903009	KIRK A. SHINER DVM	1,625
00718	SANDSTONE	4903077	TALL GRASS, LLC	4,446
00718	SANDSTONE	4903085	MEADOW RANCH, LLC	605
00719	SEPARATION RIM	4914975	RICHARD CARTER	884
00723	SHAMROCK PASTURE	4903091	S DIAMOND RANCH, LLC	1
00741	BROWNS CANYON	4900214	D BAR Z LLC	995
00756	COYOTE SPRINGS	4900319	SK LAND AND CATTLE COMPANY	2,775
00801	LARSON KNOLLS	4903092	STEWART CREEK, LLC	616
02026	LITTLE CAMP CREEK	4903151	BRUCE CORBETT	294
02027	MUDDY CREEK PASTURE	4903151	BRUCE CORBETT	21
10102	STEWART CREEK	4914975	RICHARD CARTER	2,756
10102	STEWART CREEK	4903015	BARTLETT, JESS & DEBBI	529
10102	STEWART CREEK	4903092	STEWART CREEK LLC	4,982
10103	CYCLONE RIM	4900143	JOLLEY LIVESTOCK GRAZING ASSOC., LLC	197
10103	CYCLONE RIM	4903266	PETERSON LIVESTOCK, LLC	85
10103	CYCLONE RIM	4903037	HILL LAND AND LIVESTOCK	1,061
10103	CYCLONE RIM	4903043	JOLLEY LIVESTOCK GRAZING ASSOC., LLC	3,683
10103	CYCLONE RIM	4903083	STRATTON SHEEP COMPANY	19,280
10103	CYCLONE RIM	4903152	SALISBURY LIVESTOCK COMPANY	2,986
10201	BUZZARD	4903062	PATHFINDER CATTLE COMPANY, LLC	11,413
10202	BUZZARD RANCH MEADOW	4903062	PATHFINDER CATTLE COMPANY, LLC	339
10203	CHERRY CREEK	4903269	ELLEN M. FOX	948
10203	CHERRY CREEK	4900311	CHERRY CREEK GRAZING ASSOCIATION, LLC	3,893
10204	DESERT CLAIM	4903019	MARTIN ANNIS	75
10205	BAR ELEVEN	4903089	CORP. OF THE P.B. OF THE L.D.S. CHURCH	11,419

10207	FERRIS MOUNTAIN	4903026	FERRIS MOUNTAIN RANCH, INC.	4,711
10209	JUNK CREEK	4903062	PATHFINDER CATTLE COMPANY, LLC	2,095
10212	LONG CREEK	4903039	PATHFINDER CATTLE COMPANY, LLC	1,453
10215	POLE CANYON	4903019	MARTIN ANNIS	750
10216	SAND CREEK	4903062	PATHFINDER CATTLE COMPANY, LLC	402
10217	SAND CREEK RANCH PASTURE	4903062	PATHFINDER CATTLE COMPANY, LLC	108
10218	SEMINOE	4903055	MILLER ESTATE CO.	11,066
10219	STATION 8	4903019	MARTIN ANNIS	804
10220	TAPERS	4903036	ARCHIE AND BRENDA LLOYD	99
10221	STONE	4903031	760 RANCH LLC	9,773
10222	WOOD CREEK	4903027	FORSBERG RANCH	294
10604	COAL BANK WASH	4903016	FILL-MORE BEEF, LLC	480
10607	ECHO SPRINGS	4903000	ADAMS & ADAMS	2304
10609	FILLMORE	4903016	FILL-MORE BEEF, LLC	3,374
10615	RINER	4903040	RODEWALD GRAZING ASSOC., LLC	3,134
10619	SOUTH RED DESERT	4903021	HEATH LAND AND ENERGY	756
10620	SOUTH WAMSUTTER	4903000	ADAMS & ADAMS	1,115
10621	TIPTON	4903065	P. H. LIVESTOCK COMPANY	4752
10626	LAZY Y S RANCH	4903000	ADAMS & ADAMS	1321
10720	SHAMROCK HILLS	4903091	S DIAMOND RANCH, LLC	1,678
10722	CHAIN LAKES	4903075	LADDER LIVESTOCK COMPANY, LLC	1,380