

BRIDGER MOUNTAIN LANDSCAPE ASSESSMENT of the STANDARDS for HEALTHY RANGELANDS

Lander Field Office

Document for Agency, Permittee, and Interested Public Information
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Executive Summary

This document is a Wyoming Standards of Rangeland Health evaluation for the Bridger Mountain Landscape (BML), Lander Field Office, Wind River/Bighorn Basin District, Bureau of Land Management (BLM). Resource conditions are described for over 73,000 acres of public land. The evaluation pertains to 42 BLM grazing allotments and is based on an interdisciplinary team (ID Team) field assessment conducted during the summers of 2009, 2010 and 2011. Field data support the following general observations about the BML:

- With some localized exceptions, native uplands support healthy, diverse plant communities that allow for rangeland processes to function properly. Evidence of accelerated soil erosion is generally absent in upland areas.
- Most riparian and wetland areas are in Proper Functioning Condition. Key vegetation components necessary to support proper functioning riparian systems are still present in most areas.
- Approximately 89 percent of all upland acres and 92 percent of all riparian acres in the BML meet Rangeland Health Standards. These acres are capable of supporting healthy soils, sustainable watersheds, and current commercial activities including livestock grazing. They are also currently providing healthy habitat for greater sage grouse and other wildlife species that rely on the landscape for habitat.
- Approximately 11 acres of riparian habitat and 8,050 acres of upland habitat fail Rangeland Health Standards. A determination will identify causal factors at the time of permit renewal. Permit renewal Environmental Assessments will analyze alternatives/solutions to failing standards that are determined to be caused by current livestock management.
- The fire cycle in the BML has been altered by aggressive fire suppression and has created certain imbalances, such as juniper encroachment into unsuitable habitats and sagebrush dominance in sagebrush grassland communities. While a healthy understory prevents this from creating a failure of the upland vegetation standard in most areas, management actions going forward should be designed to address these issues wherever they occur.

Chapter I- Background

A. History and Process for Assessing Rangeland Health Standards

The 1995 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 were approved by the Wyoming State Director. The objectives of the rangeland health regulations are 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 of physical function and biological health with elements of law relating to water quality and plant and animal populations and communities. Initially the standards focused on livestock grazing on BLM-administered lands, but the standards were developed to apply to all uses and resources.

Assessing soils, water quality, and habitat for wildlife, fisheries, and threatened and endangered species often does not correspond to allotment boundaries and is more logically evaluated at a larger scale. In January 2001, Instruction Memorandum No. 2001-079, Guidance for Conducting Watershed-Based Land Health Assessments, was sent to Field Offices from the Director of the BLM. This IM transmitted the 4180 Manual Section and 4180-1 Rangeland Health Standards Handbook and provides guidance for conducting assessments and evaluations for ascertaining rangeland health on a watershed basis.

Manual Transmittal Sheet Release 4-110 dated 1/6/2009 states that “evaluation of land health will occur primarily at the watershed level, *but can be completed at other spatial scales to properly evaluate the standard and/or the geographic area.*” In order to complete all Standard Assessments beginning in 2009, the Lander Field Office has adopted an approach of delineating landscapes within the Field Office that are similar biologically and ecologically. The arrangement of watersheds within the Field Office are still a major consideration when delineating landscapes, however, factors such as ecological sites, annual precipitation, wildlife habitat, vegetation and soils are also considered. The difference in grazing management seasons between landscapes is also a factor. Seasons which inform grazing management such as when green growth first appears, critical growth periods, and dormancy are dependent on variables such as elevation and exposure of dominant parts of the landscape toward north, south, east or west.

Our pilot project, the Bridger Mountain Landscape (BML) was chosen to be the first of approximately eleven areas within the Lander Field Office that will be assessed on a large landscape scale for Standards of Rangeland Health (See Map 1). The BML was chosen in part due to its proximity to and interaction with the Badwater Landscape to the south. The Badwater Landscape has major multiple use resource values. Achieving land health assessments and grazing management analysis in the Bridger Mountain Landscape will be an important step toward understanding management issues in the entire Badwater Watershed.

B. Public Involvement

Scoping and public involvement for data collection in the BML have been both formal and informal. Communication has been through letters and telephone calls. Interested parties were invited to participate if desired.

Cooperating agencies from state and federal government have participated in a more formal process involving an introductory meeting and a two-day field tour of the project area. A list of participants and a discussion of the field tour can be found in Appendix A. In addition to this, cooperation agency personnel, particularly from the Wyoming Game and Fish Department and the Natural Resource Conservation Service, have been included as ID team members in the field.

C. Wyoming Rangeland Health Standards

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

Standard 1- 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 where upland ground cover is appropriate for the ecological site, obvious signs of soil erosion are not apparent, and stream channels are stable or improving morphologically.

Standard 2 – Riparian and wetland vegetation have structural, age, and species diversity characteristic of the state of channel succession 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 where riparian/wetland habitat is rated in Proper Functioning Condition (PFC) or Functioning at Risk with an Upward Trend.

Standard 3 – 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 appropriate for the ecological site and are sustaining themselves under existing conditions.

Standard 4 – 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 considered met if habitat needed to support wildlife species is being sustained under existing conditions.

Standard 5 –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 meets state standards.

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

D. BLM Obligations Prescribed Under Rangeland Health Regulations

If an assessment shows that a standard(s) is (are) not being met, factors contributing to the non-attainment are identified and management recommendations are developed so the standard may be attained. An Environmental Analysis which will examine grazing management in the landscape will help determine if current livestock grazing practices are contributing to non-attainment of the standards. If livestock are shown to be contributing to the non-attainment of a standard, as soon as practical but no later than the start of the next grazing season after the determination has been made, management practices will be implemented to ensure that significant progress is being made toward attainment of the standard(s).

E. Assessment Criteria and Methods

BLM used a variety of information sources and the professional judgment of senior staff specialists to conduct upland and riparian health assessments. The best available rangeland ecological site and soils maps were consulted and agency-approved technical references and methodology, including protocols outlined in BLM Manual H-4180-1, “Rangeland Health Standards”, were used to arrive at conclusions about rangeland health conditions.

Selection of Areas Used for Assessment Determinations

In BLM’s response to public comments concerning revised range regulations, the selection of representative areas for range health assessment was addressed: “The Department [of Interior] recognizes that rangelands within a given area may be in functional, healthy conditions *even though individual isolated sites do not meet the standards or guidelines*. However, the

Department believes that general failure to meet the benchmarks *across a broader area*, such as a typical BLM grazing pasture or BLM allotment, would be reliable evidence that the area is not in healthy, functional condition” [italics added] (43 CFR, Fundamentals of Rangeland Health and Standards and Guidelines for Grazing Administration, Vol. 60, No. 35, Wednesday, February 22, 1995). Ecological sites were assessed broadly, with representative areas selected within ecological sites and allotments. Supporting data was collected using step-point and browse transects in representative areas within grazing allotments. The locations of these transects is shown on Map 2, Grazing Allotments, Ecological sites, Transect locations.

Lander Field Office ID Team members assessed upland health based on predominant conditions observed within particular ecological sites. Upland vegetation transects were located in areas that displayed these observed predominant conditions. Soil test pits were dug to confirm that appropriate ecological sites were evaluated. Upland areas isolated in size or occurrence such as those typically found immediately around livestock watering facilities or immediately adjacent to roadways, were not considered to be indicative of overall range health status for the ecological site.

The Bridger Mountain Landscape presented challenges in locating upland transects. Grazing allotments and pastures tend to be small; about five square miles on average. Because of the mountainous nature of the area and the abundance of natural water sources most rangeland health assessments and associated vegetation transects were located no more than one mile from livestock water locations. Some locations were chosen to characterize upland health within 1/2 mile of a water source. Assessment determinations were made after collecting site-specific data and observing as much of the area as possible by vehicle or on foot.

Riparian areas and associated uplands were observed and evaluated throughout the BML. A thorough survey of the area for riparian Proper Functioning Condition was conducted in 1998. All riparian locations were observed while travelling in the BML during the 2009 and 2010 field seasons, and many were observed to still be in PFC as previously rated. Riparian areas that had not been previously assessed, or that had been rated as Functioning at Risk in the last assessment were singled out for PFC assessments during the latest data collection effort.

Browse transects, which are scientific studies that measure attributes of shrub species that are used as food by wildlife, are located based on various criteria. Permanent browse transects measure changes in shrub communities over time and may be located in areas where human influences such as grazing practices or brush treatments are known or suspected to have decreased browse availability in the past. They may also be located in areas of crucial winter range for shrub-dependent wildlife species. Non-permanent browse transects are often conducted as part of other upland vegetation studies such as step-point cover transects.

Assessment Methods for Upland Sites

Current Ecological Site Inventory (ESI) data are not available for this assessment area. Ecological site potential determinations were based on Historic Climax Plant Communities and corresponding stable states as described in Natural Resource Conservation Service (NRCS) Ecological Site Descriptions (ESDs). The ID team used the best available range survey data, which were collected by BLM during a 1983 Range Site Inventory using a modified Soil

Vegetation Inventory Method, to assure that representative plant communities were visited and assessed in each allotment pasture. Due to the difficulty of the terrain and the long-term grazing history of the area, baseline or reference areas were not sought out, but rather existing conditions as they appeared over most of the landscape were compared to the ESDs.

Assessing Plant Cover, Plant Diversity, and Wildlife Habitat

The ID team determined percent plant cover for assessment sites by using a BLM approved method: the step-point transect, (“Sampling Vegetation Attributes”, USDI, BLM Tech. Ref. 1734-4, 1996. The step-point method involves recording observations along a paced (stepped) line at a specified number of paces, then at a specific point, such as a notch in the toe of a boot. A pin is then used to determine what kinds of cover (bare ground, vegetation, gravel, stone, or dead plant litter) are encountered at ground level and/or in the plant canopy above the point.

Due to time constraints, the ID team chose to sample rangeland with a combination of 100 to 200 point step-point transects and ocular estimates. For each assessment site, vegetation data and observations concerning the site’s physical integrity were recorded on Evaluation Sheets derived from “Interpreting Indicators of Rangeland Health”, USDI, BLM Tech. Ref. 1734-6 (2000). In order to assess suitability of upland range for terrestrial wildlife values, BLM also measured vegetation attributes that affect wildlife security and production. These attributes included the age and condition of sagebrush and other browse species. In addition, digital images of upland habitat were taken. Changes or lack of change in vegetation communities was visible from these photos. Finally, professional judgment and knowledge of the area were used to draw conclusions about land health when there were departures from exact stable state descriptions. Spot checks and data collections were conducted on allotments in the area which were assessed in the last decade to determine trend on those allotments and to calibrate professional judgment on similar sites.

Riparian Proper Functioning Condition (PFC) Assessments

The primary method used in evaluating the standard for riparian health is through a qualitative assessment procedure called Proper Functioning Condition (PFC). This process evaluates physical functioning of riparian/wetland areas through consideration of hydrology, vegetation, and soil/landform attributes. A properly functioning riparian /wetland area will provide the elements contained in the definition:

- Dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality
- Filter sediment, capture bed load and aid floodplain development
- Improve flood-water retention and ground water recharge
- Develop root masses that stabilize streambanks against cutting action (TR 1737-15 1998)

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 desired values (e.g., water retention, habitat for wildlife, or forage) over time. PFC assessments have been conducted

in the area since the late 1990s, with the most recent assessments occurring during field seasons 2009, 2010 and 2011. In addition to PFC, photo-points have been used to document riparian condition.

A part of PFC scoring is the determination of upward, downward or not apparent trend. Riparian trend is determined by comparing the present situation with previous photos, studies, inventories, and any other documentation or personal knowledge existing prior to the PFC assessment. If information prior to the assessment is lacking, indicators of “apparent trend” may be deduced during the assessment process. Presence or absence of riparian/wetland species that correlate with soil moisture characteristics can be especially useful. However, care must be taken to relate these indicators to recent climatic conditions as well as management. If insufficient evidence exists to allow recognition of a trend toward PFC (upward) or away from PFC (downward), then trend is considered to be “not apparent” (BLM, TR 1737-15, 1998, p20).

Water Quality Assessment

The quality of the water yielded by a watershed is determined by physical and chemical properties of the geology and soils unique to the watershed, the prevailing climate and weather patterns, current resource conditions, current land uses, and quality of management of those uses. For streams that lack specific water quality data it is unknown if the standard is met.

Chapter 2 – Bridger Mountain Geographic Landscape Environment and Resources Description

A. General

The analysis area considered in this document is referred to as the Bridger Mountain Landscape. The land in The Bridger Mountain Landscape occupies the high country between the Wind River Basin and the Bighorn Basin in central Wyoming. It is bordered by the Wind River Indian Reservation and Bureau of Reclamation lands to the west. Its northern and eastern borders are the boundary of grazing allotments administered by the Lander Field Office. It includes those parts of the upper Bighorn, Nowood and Lower Wind River watersheds that lie within the Lander Field Office. It also includes those parts of the Badwater watershed that lie within the Lander Field Office and also lie within NRCS Precipitation Zones that receive ten or more inches of annual precipitation. Its southern border is the boundary between the five to nine inch precipitation zone to the south, and the 10 to 14 inch precipitation zone to the north. The analysis area occupies approximately 133,306 acres. Approximately 116,201 acres lie within the Lander Field Office.

The BML is situated in the northeast of Fremont County, Wyoming but spills over into Hot Springs County to the north and Natrona County to the east. It contains approximately 12,007 total acres in Hot Springs County 2,287 of which are BLM managed public land, 2,688 in Natrona County, 1,128 of which are BLM managed public land and 2,416 acres in Washakie County, 1,510 acres of which are BLM managed public land. These lands outside Fremont County are outside the Lander Field Office boundary. Grazing allotment boundaries have not been historically established along Field Office or county lines so the LFO manages public lands in grazing allotments that have lands both within the LFO and within the Worland Field Office (Hot Springs and Washakie Counties) and/or within the Casper Field Office (Natrona County).

Land ownership in the BML consists of 55 percent federal lands, 37 percent private lands, and eight percent state lands. Federal ownership includes 73,789 acres administered by the Bureau of Land Management. Land ownership patterns vary from small, 40 acre blocks of public lands to various mixtures of public and non-public lands. (See Map #3).

Human population levels are very low with a few ranch houses and summer cabins, and no towns or settlements within the GMA. Improved roads are limited to dirt and graveled roads which are maintained by the county, federal agencies, and private parties. Human use on public lands within the assessment area is generally related to livestock grazing, communications tower installation and maintenance, and recreation. Recreation is limited in many places due to lack of public access.

B. Climate

Climate in the BML is semi-arid with 10 to 20 inches of precipitation depending on elevation. Precipitation occurs in the form of both snow and rain; June is generally the wettest month for higher elevations and May the wettest month in lower elevations. Snow distribution at lower

elevations is influenced by wind with drifts forming behind taller plants and topographic features. The average summer temperature is 60 degrees and the average winter temperature is 27 degrees.

The amount of precipitation in any particular location depends on topography—precipitation increases with elevation. Some precipitation occurs as thunderstorms, occasionally accompanied by hail, with isolated high-intensity, short-duration thunderstorms occurring between June and September. Summer storms may generate more lightning strikes than precipitation.

This area is also characterized by periodic drought, the latest lasting from 2000 to 2009. Generally, the last spring frost occurs in late May and first frost by mid-September. The frost-free period (temperatures above 32 degrees F) varies from approximately 111 days at lower elevations to 48 days at higher elevations. However, frost may occur during any month of the year.

C. Topography/Landscape Description

Topography of the BML is largely characterized by steep and rugged terrain intersected by narrow stream-cut valleys. Although named the Bridger Mountain Landscape for the central and most dominant mountain range within its boundaries, the landscape also contains foothills of the Bighorn Mountains. The Bridger Mountains run almost east to west and are geologically part of the Owl Creek Mountains. The BML begins on the west end of the Bridger Mountains above the deep cut of Wind River Canyon. The most prominent peaks in this range belong to Stone Mountain, Birdseye Mountain, and Copper Mountain to the west and Guffy Peak, Greer Peak and Fuller Peak to the east. Because Copper Mountain is centrally located and has three main peaks, this area is also known colloquially as the Copper Mountains. Birdseye Pass, a high pass between Birdseye Mountain and Copper Mountain, was once a main roadway between the Wind River Basin and the Bighorn Basin. At the east end of the Bridgers, Bridger Pass, another much broader main pass, separates the Bridger Mountains from the foothills of the Bighorn Mountains. Lysite Mountain rises to the east of Bridger Pass and is one in a series of five or six steep north-to-south ridges, each flanked by two drainages or creeks some of which form minor mountain passes. One of these, Cottonwood Pass, is the main corridor through the mountains in the east part of the block. Farthest east is the Sioux Pass, which leads into the Bighorn Mountains.

Elevation ranges from 5,200 feet along Birdseye Creek to 8,272 on Copper Mountain. Most of the higher peaks across the landscape block are from 7,000 to 7,500 feet, and the lower valley floors are around 5,500 to 6,300 feet. The lower elevations, streambanks, high saddles, and gentler north-facing slopes tend to be in private ownership while the public land is situated most often in the steeper, higher-elevation uplands and away from streams and creeks.

Badwater Creek, which lies to the south of the project area, originates in the Big Horn Mountains, then flows through the low country from east to west. Snyder Creek, Cottonwood Creek, Lysite Creek, Bridger Creek, Dry Creek, and Hoodoo Creek all originate in the project area and flow to Badwater Creek.

D. Soils and Ecological Sites

The Bridger Mountain Landscape Block consists of Twenty-two soil mapping units from the Soil Survey of Fremont County, East Part and Dubois Area, Wyoming. Most often the mapping units are of two or more soil types, forming complexes or associations. A table of soil mapping units and their characteristics is found in Appendix 2. The table is arranged by high, mid and low elevation soils.

Soils at all elevations in this block are formed in residuum, alluvium, or slope alluvium. In the highest elevations in the heart of the Bridger Mountains they are derived dominantly from schist or gneiss. Other high-elevation soils are derived primarily from sandstones, limestones, or granite. Middle to lowest elevation soils are derived from a variety of parent materials, mostly of sedimentary origin such as sandstones, limestones, and siltstones. Soil surface textures range from clayey to loamy to sandy and depths range from very shallow to somewhat deep.

There is a diversity of soils and associated range sites in the study area. Based on soil mapping units the ecological sites present in the area are predominately Shallow Loamy 10 -14 inch precipitation, Foothills and Basins East, Gravelly 10-14 inch precipitation High Plains Southeast, Shallow Loamy 10-14 inch precipitation High Plains Southeast, Course Upland 10-14 inch precipitation High Plains Southeast, Shallow Loamy 15-19 inch precipitation, Foothills and Mountains East and Loamy 15-19 inch precipitation, Foothills and Mountains East. (For sites visited and evaluated see Map 2: Grazing Allotments, Ecological sites, and Transect locations, and Tables III-1 through III-11 page 28 through 33).

E. Upland Vegetation

Observed upland vegetation is predominantly sagebrush-grass intermixing with juniper woodlands at higher elevations. Bluebunch wheatgrass is the most common grass species. Big sagebrush is the most common species of sagebrush, with basin, mountain, and black sagebrush the other principle types found in this area. Basin big sagebrush occurs in low elevations in association with major drainages. Mountain shrubs, which include bitterbrush, snowberry, serviceberry, chokecherry, and mountain mahogany, occur rarely and are usually confined to snow catchment areas or draws in the higher elevations. Utah or Rocky Mountain juniper woodlands occur throughout, but are concentrated for the most part in the broken country in the Copper Mountain and Birdseye Pass area in the west and in elevations above 6,000 feet in the east.

Perennial grasses that currently occur on the uplands include bluebunch wheatgrass, mutton bluegrass, Idaho fescue, Sandberg bluegrass, thickspike wheatgrass, blue grama, threadleaf sedge, bottlebrush squirrel tail, green needle grass, and Indian rice grass. Common forb species include phlox, penstemon, hawksbeard, aster, fleabane, buckwheat, biscuit root, onion, and milk-vetch. Annuals include cheatgrass, pepperweed and halogeton.

F. Riparian/Wetland Areas

Riparian areas are the interfaces between terrestrial and aquatic ecosystems. As ecotones, they encompass sharp gradients of environmental factors, ecological processes, and plant communities (Gregory et.al., 1991). These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Typical riparian areas are associated with perennially and intermittently flowing streams or springs. Ephemeral streams or washes that do not have vegetation dependent upon free water in the soil are not considered riparian habitat.

Although riparian/wetland habitat makes up a relatively small percentage of the BML, these important communities are some of the most productive found on public lands. Their ecological significance far exceeds their limited physical area. Riparian and wetland areas are major contributors to ecosystem productivity and structural and biological diversity, particularly in drier climates (Elmore and Beschta 1987). They are important for recreation, wildlife habitat, water supply, cultural and historic values, as well as livestock production. Riparian areas provide food and shelter for the animal community and are critically important to birds, amphibians and other wildlife species. Riparian areas affect the quantity and quality of water for on-site and downstream water uses, such as irrigation, water for wildlife and livestock, and recreation. Riparian areas also help store water and reduce risk of flash floods. For riparian areas to provide these benefits, they must have the plant species diversity, structure, and abundance appropriate for the area.

The typical riparian areas on public land in the Bridger Mountain Landscape are small springs and associated herbaceous wet-meadows occupying less than $\frac{1}{4}$ acre or a narrow stream tributary guarded by steep banks. The vegetation associated with either of these sites depends on whether moisture is available on a year round basis or if it comes and goes with the seasons or with precipitation events. Nebraska sedge or water sedge and spike rushes can be found on the wettest sites, along with tufted hair grass. Drier sites may have Baltic rush, timothy, Kentucky bluegrass mat muhly, alkali sacaton or red top. Basin wild rye is a common occurrence along many drainages, streams and springs. Tree-dominated habitat such as cottonwood or willow occurs in strips, along perennial or ephemeral streams. Willow riparian shrublands occur as scattered individuals or as denser communities, on wet sites that are somewhat thermally protected along drainages. Juniper woodlands occur along foothill and mountain streams, especially within steep gradients and confining canyons. Shrubs occur in various types of riparian habitat and may include baneberry, basin big sage, chokecherry, wild rose, gooseberry, or currents. Forbs may include mint, horsetail, cinquefoil, goldenrod, bluebells, false Solomon's seal, thistles, or yarrow.

The Bridger Mountain Landscape contains parts of four watersheds: the Lower Wind River, Upper Big Horn, Nowood and Badwater (See Map 4). Approximately 20,053 acres of the Bridger Mountain Landscape are contained within the Lower Wind River Watershed. BML drainage systems within this watershed flow north, south and west to the Wind River, either directly or via Boysen Reservoir. The high country of Birdseye Pass and the western peak of

Copper Mountain are intersected by several intermittent and ephemeral drainages, the most prominent being Birdseye Creek and Tough Creek which are largely intermittent within the analysis area, although upper tributaries flow year-round. Their main channels flow approximately 5 miles from their sources to the southern boundary of the Bridger Mountain Landscape. They have numerous intermittent tributaries that feed into them from the northwest and northeast. Minor drainages include Woods Basin, Gold Creek Cottonwood Creek and several unnamed drainages.

Only 4,243 acres in the BML are contained within the Upper Big Horn Watershed. Grass Creek, Jones Creek and their tributaries are intermittent streams that flow northwest toward Buffalo Creek which drains into the Big Horn.

The Nowood Watershed drains the north slope of the southern Big Horn Mountains. 12,015 acres of this watershed lie within the analysis area. Stove Creek takes a northward course to the Nowood River. Crawford Creek flows to the Nowood River.

The main watershed in this area, the Badwater drains 94,995 acres within the analysis area. Badwater Creek is fed from the north by creeks and drainages that flow south out of the high country of the BML. Major creeks from west to east include Reservoir Creek, Hoodoo Creek, Dry Creek, Schoening Creek, Dolus Creek, Bridger Creek, Lysite Creek, Cottonwood Creek, Snyder Creek and Sioux Creek. These creeks are interspersed with unnamed intermittent and ephemeral drainages, all fed by minor tributaries from the northwest and northeast. A basic pattern is repeated across the landscape. The main channels all flow from north to south with the perennial sections of the creeks most often lying within deeded land. They are fed by numerous springs and intermittent tributaries that are often on BLM managed public land.

Most of the main stream systems contain interrupted perennial and intermittent seasonally flowing segments. Subsurface recharge and overland flow to these streams are mainly from snowmelt, with peak flows and overland runoff occurring in May and June, tailing off by early July. By mid-July and early August surface flow in many streams is reduced to only short, discontinuous segments.

Lentic sites contain either static water or no surface water, or have limited flow for only a short distance, with no distinct channel in evidence. Lentic systems within the assessment area primarily consist of natural wet meadows, springs or seep sites within mostly upland portions of drainages. These sites are generally relatively small (less than an acre to an acre or two), and during a normal year flow water only a short distance down slope or stream, sometimes drying completely by late summer, prior to fall moisture. A few smaller man-made reservoirs are also characterized as lentic sites.

The majority of creeks and water courses and their associated riparian areas within the BML lie across deeded land, split by public lands for only short, infrequent sections. Water courses on public land consist mostly of intermittent to ephemeral drainages, and include draws and minor tributaries. Where water is more reliable, such as on Birdseye Creek and Lysite Creek, these areas support riparian habitat. As water becomes more limited they do not support wetland vegetation.

G. Grazing

There are 40 allotments permitted for grazing use on public lands in the analysis area. The southern boundary of the area does not match grazing allotment boundaries, but rather, ecological site boundaries. Therefore, 23 of the allotments are completely within the analysis area and 17 are only partially within it. Grazing use is primarily cattle; however several allotments are permitted for sheep. Historical use in this area has shifted from sheep to cattle. The Taylor Grazing Act in 1934 began a process of creating allotments and developing range improvements. Fencing of allotments has been an ongoing, long-term process. Pasture fencing has occurred mostly on some of the larger allotments and on allotments with a low percentage of public land.

Appendix C gives some basic information about each of these allotments and describes how they are sorted into three management categories. Table C1 lists the allotment number, name, BLM public land acreage, number and kind of animal permitted, grazing season, percent public land, total animal unit months (AUMs) available on all lands within the allotment, AUMs available on BLM public land and management category. Table C2 gives more information about category “T” allotments. Some grazing allotments in the BMGMA were assessed for Rangeland Health Standards between 1999 and 2003. Table C3 in Appendix C lists these allotments and indicates whether Standards were or were not met at that time.

H. Wildlife

The LFO-RMP management objectives for wildlife species are to provide habitat quality adequate to support a natural diversity of wildlife, including big game, upland game, waterfowl, non-game species, threatened and endangered species, species of special management interest or concern, as well as to assist in meeting goals of recovery plans. In general, the primary objective of the RMP is to maintain or improve overall ecological quality, thus providing healthy wildlife habitat, within the constraints of multiple-use management. Management of various habitat types to obtain a diversity of vegetative species, cover, age classes, and structure is essential to maintain healthy wildlife populations and the associated habitat types.

The plant communities/habitat types that occur within the Bridger Mountain Landscape (BML) have been described under sections **E.** and **G.** These habitat types vary greatly in their ability to support wildlife, depending on species composition, age classes, single species dominance, horizontal and vertical structure, abundance, mosaic mix with other habitats, and proximity to features such as migration corridors and winter concentration areas (e.g. big game crucial winter range). Hundreds of species of wildlife, including birds, mammals, reptiles, and amphibians are known or expected to occur within the BML. The following standard habitat types that are found within the BML include the following; Greasewood/Sagebrush Riparian Shrubland, Cottonwood Riparian Woodland, Badland, Salt brush Steppe, Sagebrush mixed grass steppe, and Juniper/Limber pine woodland.

The BML provides both seasonal and year-long habitats for numerous wildlife species including big game such as elk and mule deer, trophy game such as mountain lions, predators, small

mammals, birds, amphibians and reptiles. Many of the species found are sagebrush-obligate birds and mammals, as sagebrush habitat is widespread throughout the area. Wildlife diversity in upland habitats is significantly affected by the presence and condition of riparian areas as many species are dependent on both upland and riparian habitats to meet their habitat requirements. Riparian habitats are capable of supporting the greatest variety of birds and mammals due to the presence of water and the species and structural diversity of the plant community. Habitats with the lowest diversity of plants, cover, and structure include badlands and rock outcrops. Badlands are relatively uncommon and make up a small percentage BML. Rock outcrops occur frequently, especially at high altitudes.

There are numerous species of special interest and/or concern that inhabit the BML or use parts of the area for migration, transitional zones or corridors. The most common observed wildlife is big game, particularly pronghorn, elk and mule deer. There are two pronghorn herds, one elk herd and one mule deer herd, all managed by the Wyoming Game and Fish Department (WGFD) that overlaps the BML. Raptors are very abundant and include golden eagles; ferruginous, red-tailed and Swainson's hawks; burrowing owls; and other hawks, harriers and owls. Other, non-game mammals commonly observed are coyotes, badger, cottontail and jackrabbits, ground squirrels, voles and mice. Songbirds are also common and vary by habitat type with sparrows, meadowlark and horned lark most often seen in sagebrush and saltbush areas and warblers, swallows, and flycatcher species observed in riparian habitats. Chukar and gray partridge are common game birds in the BML. No Threatened or Endangered Species are known to be in the BML, although habitat for several BLM Sensitive Species is found in the landscape. Greater sage grouse are an important species of interest and a candidate species for listing under the ESA. Fisheries are also of concern in the BML. Accounts of these species and their habitats are described in the following paragraphs.

Big Game: Pronghorn, Mule deer and Elk.

Habitat for pronghorn, mule deer and elk, including crucial winter range (See Map 5) occurs throughout the BML. Pronghorn is the most visible and numerous big game species in the BML due to open expanses of sagebrush dominated landscape. Pronghorn rely on Wyoming big sagebrush habitat, in addition to other plant communities like saltbush steppe, greasewood, and short grasslands and open juniper woodlands. During the winter, pronghorn diets consist of primarily Wyoming big sagebrush, while spring and summer diets include higher amounts of forbs, grasses, and other shrubs. There are portions of two pronghorn herd units located within the BML. These herd unit areas are identified as the (1) Copper Mountain Herd Unit, and the (2) Badwater Herd Unit, which incorporates the majority of the BML. The northern portion of Township 39 Range 92 within the BML has been identified as pronghorn crucial winter range. This area is part of the Badwater Herd Unit.

Mule deer are the second most abundant big game species following pronghorn in the BML. Mule deer are not found evenly distributed in the BML. They prefer areas with hiding cover and higher precipitation sites with forbs, which tend to occur at higher elevations and along stream drainages in this area. Mule deer select forbs and grasses when green and more nutritious during the spring and early summer, shifting to primarily shrubs in the fall and winter. Compared to pronghorn, mule deer prefer a mixture of sagebrush and other shrubs during the winter. There is one mule deer herd unit that covers the entire BML. This herd unit is identified as the Southwest Bighorn Herd Unit. Most of the mid-elevation area (greater than 50 percent) of the BML has

been classified as mule deer crucial winter range although some mule deer migrate to lower elevations within and surrounding the BML during severe winters (e.g. Badwater Creek area).

Elk also inhabit the BML during the spring, summer and fall periods. Elk normally prefer to stay close to hiding cover, so are most often associated with juniper woodland and or tall shrub land (i.e. mountain sagebrush) communities. They prefer grasses and have a high diet overlap with cattle, but will include more forbs in their spring diet and more shrubs during the winter. There is one elk herd unit that includes the entire BML, referred to as the South Bighorn herd unit. Elk winter or crucial winter range is delineated on about six sections of land in the northeast corner of the BML, however, the majority of the elk winter at lower elevations north of the BML.

Whitetail deer also inhabit a portion of the BML. Whitetail deer are associated with agricultural areas where irrigations systems have been developed to raise hay for livestock. These areas are generally along perennial streams, such as Dry Creek and Cottonwood Creek that flow southward into the Badwater Creek drainage.

Raptors

There are several raptor species that have been observed within the BML, or their nests have been identified within the area. A total of 20 raptor nests have been mapped within or within 0.75 mile of the BML. Raptors that have known nests within the BML include the northern goshawk Cooper's hawk, red-tailed hawk, ferruginous hawk, golden eagle, great horned owl, and prairie falcon. Although nests have not been identified for the northern harrier, burrowing owl, and American kestrel, these species have the potential to nest within the BML.

In 1998, a northern goshawk nest was located in a cottonwood tree on the south side of Copper Mountain. This species generally inhabits deep woods with mostly conifers. The Cooper's hawk, another forest nester, inhabits mixed forests and open woodlands. Both species are fast flyers and hunt for common medium-sized birds such as mourning doves, jays, grouse, and sometimes, small mammals. The red-tailed hawk inhabits a variety of open habitats. The ferruginous hawk inhabits arid open land and grasslands. Both of these hawks feed on small or medium sized mammals, birds and reptiles.

The golden eagle inhabits mountains, foothills and adjacent grasslands. This bird hunts by soaring and then diving down on prey such as rabbits, large rodents, and some birds. Eagles are opportunists and will often feed on carrion such as road killed deer. The two golden eagle nests in the BML may have been built by the same nesting pair, as eagles are territorial and may live up to 20 years in the wild.

These raptors all nest and forage within the BML. Golden eagles often stay year-long, while other species migrate to warmer climates. Prey species are common, with, abundance varying year to year due to weather and climate. Raptor nests are monitored opportunistically by wildlife biologists to determine nest activity and status, although monitoring is generally associated with development projects and activities. There are known nest locations for ferruginous hawks and northern goshawk, although the current status of these nests is not known.

Nongame Wildlife

Many species of nongame mammals, birds, reptiles, and amphibians are found throughout the BML, in a wide variety of habitats. The Gas Hills and Divide Standard Wildlife Habitat Types describe these habitats and what species are expected to occur in each habitat within the landscape. This information is available in the LFO. The abundance and species diversity of nongame wildlife is greatest in habitat types with high diversity in structure and species of vegetation. Such habitat types include wetland-riparian, limber pine, and mountain shrub land.

Few non-game wildlife inventories have been done in many of the habitat types and little is known about animal communities within specific vegetative types in the LFO. Over 350 species of wildlife, including birds, mammals, reptiles, and amphibians likely occur within the LFO, and most of these species are classified as non-game wildlife. In general, aquatic habitats support the greatest diversity of species and are the least common types of habitat in the BML.

The presence of surface water notably contributes to habitat value for nongame species. Wetland-riparian habitat types, which occupy less than one percent of the BML, are of greatest importance for nongame wildlife. More species of breeding birds are found in riparian habitats than the more extensive surrounding uplands. There are less than 500 acres of wetland habitat in the BML under all ownerships.

Game Birds

Game bird populations within the BML include Chukar partridge, gray partridge and ring-necked pheasant. Game bird populations fluctuate annually but the long-term persistence of these populations is dependent on habitat conditions.

Threatened and Endangered, Proposed or Candidate Species

Six federally designated threatened and endangered species, the Canada lynx, grizzly bear, black-footed ferret, Gray wolf, Ute ladies 'tresses and blowout penstemon, are known to occur within the LFO. However, one candidate species, the greater sage grouse, currently occurs in the BML. The US Fish and Wildlife Service has determined that the greater sage grouse is warranted for protection under the Endangered Species Act, but precluded from listing at this time due to higher agency priorities. Last year, the mountain plover, which can be found in the BML, was proposed for listing under the Endangered Species Act. In May 2011, the U.S. Fish and Wildlife Service determined that the mountain plover does not warrant listing under the ESA.

BLM 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 focus species management efforts towards maintaining habitats under a multiple use mandate. It is not the intent of the sensitive species list to track species statewide as this is done by other entities. The BLM obligation is to determine distribution and manage 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 does not contribute to the need to list the species under the provisions of the ESA. There are 25 BLM sensitive animal species, including five raptors, three bats, one rodent, three grassland obligates, six sagebrush obligates, seven riparian/wetland obligates and 12 sensitive plant species in the LFO. These species include six mammals, 15

birds and four amphibians. Many species are not on the list due to the lack of status, distribution, and habitat requirement information which prohibits any management attention. BLM Sensitive Species List

The BLM has signed an agreement with WGFD with the purpose of the two agencies working together to benefit all wildlife in Wyoming, by cooperating in planning, and sharing data, among other efforts. In addition, the Wyoming Natural Diversity Database maintains a list of Wyoming plant and animal species of special concern.

The BLM sensitive species list is meant to be dynamic. Many species are not included on the list because their status is largely unknown and basic inventory is needed. It is the BLM Wyoming's intent that the WYNDD and WGFD lists should be regularly consulted by field personnel to develop inventory projects. These projects will be designated to gather information on population size, trend, and distribution for these poorly known species. The inventory or monitoring of these species is a BLM priority although allocating the necessary funding to conduct these activities is problematic.

Table II-1 lists the BLM sensitive species that are known to occur in the BML, or where potential habitat occurs within the BML.

Table II-1 BLM Sensitive Species that May Occur in the BML.

<i>Species</i>	<i>Status</i>
<i>Platte River depletion</i>	Threatened and Endangered (downstream)
<i>Long-eared Myotis</i>	BLM Sensitive
<i>Spotted bat</i>	BLM Sensitive
<i>White-tailed prairie dog</i>	BLM Sensitive
<i>Pygmy rabbit</i>	BLM Sensitive
<i>Mountain plover</i>	BLM Sensitive and Proposed species
<i>Northern goshawk</i>	BLM Sensitive
<i>Ferruginous hawk</i>	BLM Sensitive
<i>Peregrine falcon</i>	BLM Sensitive
<i>Greater sage grouse</i>	BLM Sensitive and Candidate species
<i>Burrowing owl</i>	BLM Sensitive
<i>Sage thrasher</i>	BLM Sensitive
<i>Loggerhead shrike</i>	BLM Sensitive
<i>Brewer's sparrow</i>	BLM Sensitive
<i>Sage sparrow</i>	BLM Sensitive
<i>Northern leopard frog</i>	BLM Sensitive
<i>Great Basin spadefoot</i>	BLM Sensitive
<i>Boreal toad (Northern Rocky Mountain population)</i>	BLM Sensitive
<i>Spotted frog</i>	BLM Sensitive
<i>Limber Pine</i>	BLM Sensitive
<i>Owl Creek Miners</i>	BLM Sensitive

<i>Porter's Sagebrush</i>	BLM Sensitive
<i>Persistent Sepal Yellowcress</i>	BLM Sensitive
<i>Shoshonea</i>	BLM Sensitive

Greater sage grouse

Of all the candidate or special status species, Greater sage grouse are of primary concern when evaluating Rangeland Health Standards. Greater sage grouse are common inhabitants within the LFO and portions of the BML. The greater sage grouse is commonly found at lower elevations throughout the BML throughout the year and at higher elevations during the summer.

Sage-grouse populations have exhibited declines throughout the range over the past 30 to 40 years. Sage-grouse are sagebrush obligate species and each aspect of their life cycle requires slightly different elements within the sagebrush communities. Grass height and cover play an important role in the nesting success of sage-grouse. Early brood rearing habitats consist of relatively open stands of sagebrush or narrow, shrub-free stringers of meadows in draws or other areas with abundant soil moisture. During the summer months sage-grouse move to moderately moist sites seeking succulent forbs. During the winter months, sage-grouse often congregate on wintering areas and feed almost exclusively on sagebrush leaves.

In March 2010, the U.S. Fish and Wildlife Service determined that the greater sage grouse warranted listing as a threatened species under the ESA but precluded listing due to higher priority actions. Since the U.S. Fish and Wildlife Service now considers the Greater sage grouse a candidate species under the auspices of the ESA, the State of Wyoming has developed a “Core Population Area” strategy to conserve the sage-grouse. This statewide strategy had gained recognition from the U. S. Fish and Wildlife Service as a sound framework for a policy by which to conserve greater sage grouse. There are six greater sage grouse leks and associated nesting habitat within the BML, but only three of these leks are active (See Map 6). Another lek is located within six tenths of a mile from the BML boundary. Greater sage grouse Core Area, as outlined in BLM IM No. WY-2012-019 makes up approximately 32 percent of the area. The Core Area is located primarily in the eastern part of the BML.

I. Fisheries

Fish habitats are managed according to laws, regulations, BLM policies and principles of fisheries management within the BLM’s multiple-use mandate. The BLM’s responsibility is to manage aquatic habitat; authority for the fish and aquatic life is the responsibility of the WGFD, which regulates fishing. BLM’s management of the habitat directly affects all public lands and indirectly affects all aquatic species both upstream and downstream of BLM-administered lands.

Recreational fisheries within the BML area include only small stretches of perennial streams on BLM-administered lands. Those streams with fisheries or potential fisheries include Lysite Creek, Bridger Creek, Sioux Creek, Hoodoo Creek and Dry Creek. Most sections of these streams are located on private land. The only fisheries located on BLM land within the BML assessment area is on approximately one mile of Alkali Creek. Fisheries have been identified on private lands in Lysite Creek, and Hoodoo Creek. Fisheries also occur in the upper reaches of Sioux Creek and Bridger Creek outside of the LFO boundary. Brook trout and brown trout are

the only “sport” fish found within the assessment area. There are currently no special status native fish species known to occur within the BML. The number of days that fishermen use this area (if any) is unknown, but is expected to be very low for this particular fishery.

The condition of fisheries habitat is related to hydrologic conditions of the upland and riparian areas associated with, or contributing to, a specific stream or water body. Fishery habitat conditions are closely tied to riparian conditions and water quality. Riparian vegetation moderates water temperatures, increases bank stability, supports insects used as an important food source, filters sediment, provides in-stream habitat, and provides organic material for ecosystem function. Rangeland health standards and riparian Proper Functioning Condition ratings are two monitoring methods used by the BLM to determine health of fish habitat.

Livestock grazing is the most important issue with regards to potential adverse impacts on fisheries within the BML. The potential impacts of livestock grazing on stream processes and fish habitats have been well documented. These include the loss of stabilizing riparian vegetation which can lead to stream instability and an associated loss of habitat complexity, the loss of shading vegetation which can lead to elevated stream temperatures, increased sediment delivery, and loss of stream channel complexity provided by fluvial processes and woody debris.

J. Fire and Fuels

Though primary fire ecology research is limited within this project area, it is estimated that historic fire occurrence is extremely variable within the BML. Mature juniper-limber pine woodlands have historically had very little fire due to sparse understory vegetation. Mean fire return intervals in these sites could likely have been up to 200 years. Mean fire return interval is defined as the average period between fires under the presumed historical fire regime. Mountain sagebrush grasslands within this area are estimated to have a mean fire return interval of approximately 80 years. Transitional shrub steppe within this range is dominated by Wyoming big sagebrush and black sagebrush and the mean fire return interval is anywhere between 90 and 140 years due to sparser understory vegetation. Though Wyoming sagebrush stands adjacent to more robust mountain sagebrush communities and may have a historic fire return interval closer to that of the higher elevation sites.

Under historic conditions prior to disturbances such as development and livestock grazing, the higher elevation mountain sagebrush steppe across this range would have been approximately five percent herbaceous dominated, such as would be found immediately after a fire, 15 percent mid-development open shrub steppe with 5-15 percent foliar cover of sagebrush, 30 percent late development open shrub steppe with 15-30 percent foliar cover of sagebrush, and 50 percent late development closed shrub steppe with 30 percent and greater foliar cover of sagebrush.

Within the juniper-limber pine woodlands within this broad area, it is estimated that historically 30 percent would have been affected by a recent fire event with 0-30 percent cover of juniper-limber pine, 30 percent would have evidence of a longer recovery period from fire with open woodland with 21-40 percent foliar cover of juniper-limber pine and 40 percent would be a mature community, relatively unaffected by fire, closed with 40-60 percent foliar cover of woodland species.

Wyoming sagebrush dominated communities within the project area probably were historically 20 percent affected by recent fire and herbaceous dominated, 20 percent with evidence of a longer recovery from fire with some open shrub steppe and 5-25 percent foliar cover of sagebrush, 30 percent still farther removed in time from the most recent fire event, open with 5-30 percent foliar cover of sagebrush, and 30 percent relatively unaffected by fire, closed with greater than 25 percent foliar cover of sagebrush.

Fire and disturbance ecology within this area has been heavily impacted by human actions and intervention. Prehistorically and historically, fire has been used to alter vegetation composition. Plant communities that appear immediately after a fire are dominated by herbaceous species are beneficial to wildlife species such as elk, pronghorn, bighorn sheep and domestic livestock. Due to the low number of significant lightning started fires within the area, the use of prescribed fire has been used throughout this geographic range since early settlement, especially within the sagebrush steppe areas. Knowledge of the location and extent of past prescribed burns implemented by private landowners within this range is limited since fires are generally not recorded, mapped or reported unless the prescribed fire becomes a wildfire. The BLM has implemented several fires within this area over the past ten years. Those fires have occurred generally East of Bridger Creek and into the western toe of the Bighorn Mountains. A notable prescribed burn project was completed in 2008 by the Lander Field Office in the Logan Pasture East of Lysite Mountain.

Over the past 60 years the use of chemical sagebrush treatments such as 2-4-D and Tebuthiuron has been relatively widespread. The primary sub-region within this mountain range where chemical treatments have occurred is from Bridger Creek to Sioux Pass, where mountain sagebrush is much more dominant than in the Copper Mountain area where juniper woodlands are more prevalent. Many of the early herbicide treatments (1950's-1970's) are largely indiscernible from untreated vegetation, as their post-treatment recovery has returned the area to mature sagebrush dominated community, much the same as would be expected before a fire. The herbicide treatments done between 1980 and 2000 are easily noticed on the landscape, and the area has generally returned to 5-15 percent foliar cover sagebrush. The use of herbicide sagebrush thinning has been used more than prescribed burning in the past twenty years as longer timelines and restrictions associated with burning on federal land. Herbicide sagebrush thinning has a unique ability to treat only private lands because it can be used more site-specifically than fire.

Though vegetative treatments have occurred extensively within the Copper Mountain to Eastern Bighorn Mountains area over the past 60 years, it is estimated that approximately 12 percent of the potentially treatable landscape (mountain sagebrush) has been treated within the past 20 years. Most areas that have not had herbicide application or prescribed burn treatments within the past 20 years are relatively unaffected by fire condition with greater than 30 percent foliar cover of mountain sagebrush. There is also evidence of juniper and limber pine encroachment into deeper soiled sites which is potentially indicative that a fire return interval has been missed.

CHAPTER III – Standards Assessments

STANDARD # 1 - Soils

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.

THIS MEANS THAT:

The hydrologic cycle will be supported for water capture, storage, and sustained release. Adequate energy flow and nutrient cycling through the system will be achieved as optimal plant growth occurs. Plant communities are highly varied in Wyoming.

INDICATORS MAY INCLUDE BUT ARE NOT LIMITED TO:

- Water infiltration rates;
- Soil compaction;
- Erosion (rills, gullies, pedestals, capping);
- Soil micro-organisms;
- Vegetative cover (gully bottoms and slopes); and
- Bare ground and litter.

The above indicators are applied as appropriate to the potential of the ecological site.

Members of a BLM Interdisciplinary Team (IDT) visited the study area during 2009 and 2010 and completed 25 Rangeland Health Indicator Evaluation Matrices on various ecological sites and plant associations. Data was collected and compared to baseline data to provide supporting information for interpreting the upland indicators. All field data is part of the public record and is available upon request. For summaries of the results of this process see Table III-1, Upland Qualitative Assessment Summary. The table outlines the findings at all 25 sites throughout the Bridger Mountain Landscape where the IDT completed the 17 Indicators of Rangeland Health Evaluation Matrix. Upland sites where Soil Site Stability and Hydrologic Function were found to be in the -none to slight- or -slight to moderate- departure from expected conditions for soils and hydrology will always meet the standard. If biotic integrity is at a moderate or greater degree of departure from expected, the soils, while not currently exhibiting undue erosion may be at a greater susceptibility for erosion problems. Sites that were found to be in moderate departure from expected conditions are subject to professional judgment depending on the factors influencing the departure. Biotic integrity is discussed under Standard #3 - Upland Vegetation.

Table III-1. Upland Qualitative Assessment Summary

Watershed	Ecological Site	Allotment Name and Number	Plant Association	Degree of Departure from Expected	
				Soil Site Stability	Hydrologic Function
Lower Wind River	Shallow Loamy 15-19 E	Mountain Pasture #01345	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight	None to Slight
	Coarse Upland 15-19 E	J Herbst Summer #01348	Idaho Fescue/ Mixed Shrub	Slight to Moderate	Slight to Moderate
		167A Scott-Robson #01308	Idaho Fescue/ Mixed Shrub	None to Slight	Slight to Moderate
Badwater	Shallow Loamy 15-19 E	Joe John's Pasture #01352	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight	None to Slight
		Lysite Mountain #01329	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight	None to Slight
	Coarse Upland 10-14 SE	Westfall #01344	Mid Bunchgrass/ Big Sagebrush	Slight to Moderate	Slight to Moderate
		Howard Pasture #01356	Mid Bunchgrass/ Big Sagebrush	None to Slight	None to Slight
		Battle Axe Berger #01331	Shortgrass/ Forbs	Slight to Moderate	Slight to Moderate
			Bitterbrush / Big Sagebrush	Slight to Moderate	None to Slight
	Shallow Loamy 10-14 SE	Quien Sabe #01365	Short Grass & Grasslike/Forbs	Moderate	Moderate
	Gravelly 10-14 SE	Top of Mountain #01358	Bluebunch Wheatgrass	None to Slight	None to Slight
	Shallow Loamy 10-14 E	Fuller Allotment #01323	Bluebunch Wheatgrass/ Needleand-thread	None to Slight	None to Slight
			Perennial Grass / Mixed Shrub	None to Slight	Slight to Moderate
		Summer Allotment #01357	Bluebunch Wheatgrass/ Needleand-thread	None to Slight	None to Slight
		Campbell #01353	Mixed Shrub / Bare Ground	Slight to Moderate	Slight to Moderate
		Lysite Mountain #01329	Bluebunch Wheatgrass/ Needleand-thread	None to Slight	Slight to Moderate
		Cottonwood Pass #01310	Bluebunch Wheatgrass/ Wheatgrass/	None to Slight	Slight to Moderate

			Needleand-thread		
		Lybyer North #01305	Perennial Grass /Mixed Shrub	None to Slight	None to Slight
	Loamy 10-14 E	Campbell #01353	Perennial Grass /Mixed Shrub	None to Slight	None to Slight
	Coarse Upland 10-14 E	168 A Stock Driveway #01341	Perennial Grass /Mixed Shrub	None to Slight	None to Slight
Nowood	Shallow Loamy 15-19 E	Henrich Pasture #01367	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight	None to Slight
		Crawford Creek #01304	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight	None to Slight
	Loamy 15-19 E	Cottonwood Pass #01334	Idaho Fescue/ Big Sagebrush	None to Slight	None to Slight
			Idaho Fescue/ Big Sagebrush	None to Slight	None to Slight
		Crawford Creek #01304	Dense Shrub/ Bluegrass	Slight to Moderate	Slight to Moderate

As Table III-1 illustrates, the vast majority of the uplands in the BML are functioning properly and meeting Standard #1 for Rangeland Health. As part of the supporting data for completing the matrices for the 17 Indicators for Rangeland Health, 42 Step-point transects, were conducted. Step-point transects measure bare ground, litter, gravel, stone, vegetative canopy cover and total ground cover. The majority of these transects were established in 2009 to 2010. However, 14 were established in 2000. Six of those established in 2000 were repeated in 2009 and 2010. No apparent trend, up or down was demonstrated by these repeated transects and the most current data is shown in this document. Five more transects established in 2000 were inspected by ID team members to ascertain current conditions by ocular reconnaissance. Tables III-2 through III-10 organize ground cover data from the step-point transects. Table III-11 takes a closer look at transects where data may indicate a problem with Standard #1. Transect numbers indicate allotment numbers (i.e. 01300) and transects within allotments (i.e. T1, T2, etc.). All other values are expressed as percentages. For example, Transect Number 01365-T5 was the fifth transect conducted on allotment 01365 and it had seven percent bare ground.

TABLE III-2: GROUND COVER DATA for Loamy 10-14 SE

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
01365-T5	7	20-30	1	15-25	4	0	88	93

*As described in Technical Guide IIB MLRA (34) Range Site Descriptions

TABLE III-3: GROUND COVER DATA for Loamy 15-19 E

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
01334-T1	10	0-20	19	5-40	1	3	67	90
01334-T2	7	0-20	28	5-40	1	0	64	93
01334-T4	5	0-20	0	5-40	0	0	95	95
01304-T1	17	0-20	17	5-40	0	0	61	83

*As described in Technical Guide IIB MLRA (43B) Range Site Descriptions

TABLE III-4: GROUND COVER DATA for shallow loamy 10-14 SE

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
01365-T1	30	40-60	14	15-25	15	0	41	70
01365-T4	15	40-60	10	15-25	60	1	15 (Basal Cover only)	85

*As described in Technical Guide IIB MLRA (34) Range Site Descriptions

TABLE III-5: GROUND COVER DATA for Shallow Loamy 10-14 E

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
01323-T1	33	15-45	12	10-25	11	0	43	67
01323-T2	20	15-45	16	10-25	15	0	49	80
01323-T3	28	15-45	12	10-25	21	2	37	72
01360-T1	22	15-45	28	10-25	12	5	33	78
01366-T1	15	15-45	28	10-25	4	0	53	85
01357-T1	30	15-45	18	10-25	0	0	52	70
01353-T1	32	15-45	19	10-25	0	0	49	68
01353-T2	32	15-45	17	10-25	2	0	49	68
01329-T1	15	15-45	6	10-25	30	5	44	75
01310-T1	10	15-45	4	10-25	41	2	43	90
01305-T4	14	15-45	7	10-25	36	2	41	86
01309-T1	36	15-45	21	10-25	24	3	16	64

*As described in Technical Guide IIB MLRA (32) Range Site Descriptions

TABLE III-6: GROUND COVER DATA for Shallow Loamy 15–19 E

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
01347-T2	2	0-30	6	15-20	2	0	90	90
01347-T3	0	0-30	8	15-20	1	0	91	100
01345-T1	9	0-30	25	15-20	0	1	65	91
01352-T1	0	0-30	15	15-20	0	0	85	100
01373-T1	4	0-30	14	15-20	5	2	75	96
01329-T2	15	0-30	14	15-20	16	5	50	85
01367-T1	17	0-30	23	15-20	2	0	58	83
01304-T2	17	0-30	14	15-20	19	4	46	83

*As described in Technical Guide IIB MLRA (32) Range Site Descriptions

TABLE III-7: GROUND COVER DATA for Gravelly 10-14 SE

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
01345-T2	7	10-15	13	10-15	29	4	39 (basal only)	93
01365-T3	18	10-15	6	10-15	5	11	60	88
01358-T1	8	10-15	11	10-15	4	2	75	92
01327-T1	8	10-15	14	10-15	19	0	60	92

*As described in Technical Guide IIB MLRA (34) Range Site Descriptions

TABLE III-8: GROUND COVER DATA for Coarse Upland 10-14 SE

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
01331-T2	30	30-40	19	15-25	23	0	30	70
01331-T3	12	30-40	13	15-25	34	0	41	88
01344-T1	25	30-40	14	15-25	22	1	38	75
01344-T4	6	30-40	6	15-25	61	8	22	94
01356-T2	12	30-40	10	15-25	15	0	63	88
01356-T3	26	30-40	11	15-25	28	0	35	74
01365-T2	25	20-30	3	15-25	32	0	40	75

*As described in Technical Guide IIB MLRA (34) Range Site Descriptions

TABLE III-9: GROUND COVER DATA for Coarse Upland 15-19 E

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
01348-T1	6	0-20	9	5-40	0	10	75	94
01348-T2	17	0-20	9	5-40	14	1	59	83
01308-T1	10	0-30	12	5-40	14	6	58	90

*As described in Technical Guide IIB MLRA (32) Range Site Descriptions

TABLE III-10: GROUND COVER DATA for Coarse Upland 10-14 E

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
01341-T1	24	10-30	11	5-30	16	10	47	76

*As described in Technical Guide IIB MLRA (32) Range Site Descriptions

NRCS Ecological Site Guides give a range of percentages of expected cover values for each site. Data collected indicates that most transect locations meet or exceed the cover requirements. Most transects are within acceptable ranges of bare ground and litter and overall ground cover expected for the ecological site or are within the margin of error based on the size of the data sets. Litter appears low on some transects; however, where vegetation percentage is high there was adequate additional litter under the vegetation canopy. Most transects show that the basic cover requirements for soil health and hydrologic function are being met in the areas they represent. Transects listed below in Table III-11 below merit further discussion. A quick look in the 'Bare Ground' and 'Litter' columns will show that all these data sets are outliers that do not

fall within the expected percentage limits for these cover categories. These individual transects are discussed in detail in the paragraphs below.

TABLE III-11: GROUND COVER DATA: A Closer Look at Transect Data

Transect	Eco-Site	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
01365-T5	Ly 10-14 SE	7	20-30	1	15-25	4	0	88	93
01365-T4	Swly 10-14 SE	15	40-60	10	15-25	60	1	15 (Basal Cover Only)	85
01329-T1	Swly 10-14 E	15	15-45	6	10-25	30	5	44	75
01310-T1		10	15-45	4	10-25	41	2	43	90
01305-T4		14	15-45	7	10-25	36	2	41	86
01344-T4	CU 10-14 SE	6	30-40	6	15-25	61	8	22	94
01356-T3		26	30-40	11	15-25	28	0	35	74
01365-T2		25	20-30	3	15-25	32	0	40	75

Transect number 01365-T5 is representative of areas where cheatgrass has become established and is the dominant species. These areas occupy dry draws mostly in the eastern half of the BML. Although cheatgrass dominance is common on Loamy 10-14 SE Ecological Sites it does not dominate all these sites nor is it confined to these sites. Cheatgrass can also be found in disturbed areas such as roadbeds and pipelines throughout the BML, areas near gates, along fencelines, or around livestock water sources, and sometimes discreet upland areas less than ¼ acre in size, usually on south facing slopes. It is estimated that approximately 1,015 acres or less than two percent of the BLM acres in the BML are dominated by cheatgrass. These acres do not meet Standard #1 due to the inability of this annual grass to maintain stable soils.

Transects 01365-T2 and 01365-T4 are representative of areas where observations suggest that soil has been lost and that erosion has occurred in the past to a point where gravel or “desert pavement” is a major component in ground cover. Because soils are not intact in these areas they do not meet Standard #1. The ID Team estimates that approximately 1,195 acres or again, less than two percent of the BLM acres in the BML are occupied by historically eroded soils. This corresponds with the area assessed under Shallow Loamy 10-14 HPSE in Table III-1, Upland Qualitative Assessment Summary, where both Soil Site Stability and Hydrologic Function were found to have a Moderate degree of departure from expected conditions, and with other low elevation areas similar in appearance. It does not represent all Shallow Loamy 10-14 inch HPSE acres in the BML.

Transects 01329-T1, 01310-T4, 01305-T1 and 01356-T3 all show a low percentage of litter. On some transects, some minor signs of erosion were observed. However, the erosion represented only a slight or slight to moderate degree of departure from expected conditions on the sites. The transects represent sites that are within ½ mile of water sources. On all sites visited within ½ mile of water sources overall ground cover was good and excessive erosion was not observed. On most, litter cover was adequate along with vegetation canopy and basal cover. Bare ground was not excessive (even where vegetative expression required failing of Standard #3 – Upland Vegetation.) These areas meet Standard #1.

Transect 01344-T4 was conducted to capture the Juniper woodlands that occupy the rocky foothills southwest of Copper Mountain. Observation would indicate that these are natural features although there is little in the Ecological Site Descriptions or in the Soil Survey to characterize them. They are steep, rocky, and inaccessible and do not lend themselves to human-caused disturbance. There is a good deal of litter immediately surrounding individual shrubs and grass plants, which are healthy and vigorous. These areas meet Standard #1.



Figure 1. Close up and panorama of ecological site where Step Point Transect 1308-T1 was conducted at T40N, R89W Section 21 NW¼NE ¼; in the eastern middle portion of 167A Scott-Robson Allotment. Bare ground was 10 percent. Vegetation cover was 58 percent and litter cover was 12 percent. Vegetation cover, and litter cover contribute to hydrologic cover and protect from risk of erosion.

The discussion under Standard #1 has focused on uplands. Riparian acres are discussed under Standard #2 – Riparian. Acres not meeting that standard due to functioning at risk with a downward or not apparent trend - also fail to meet Standard #1.

The following table lists upland and riparian acres not meeting Standard #1 by grazing allotment. These are *estimated* acres and are derived by direct observation, by extrapolation using GIS and topographic maps, by interpretation of data, and if patterns follow ecological site boundaries, by using estimated percentages of ecological sites affected within grazing allotments.

Table III-12 Estimated Acres by Allotment – Standard #1
 (*Acres are within Bridger Mountain Landscape only)

Allotment Number	Allotment Name	BLM acres in BML	Upland acres not Meeting Standard #1	Riparian acres not Meeting Standard #1	Total acres not Meeting Standard #1
01309	Logan Pasture	2,578*	0	2.0	2.0
01306	Canning	347	10	0	10
01310	Cottonwood Pass	2,317	40	.5	40.5
01323	Fuller Allotment	3,050*	100	2.2	102.2
01324	Hoodoo Creek	2,438*	155	0	155.0
01326	Lichtenstein	1,342*	20	0	20.0
01329	Lysite Mountain	8,194	30	4.0	34.0
01331	Battle Axe Berger	7,270*	40	0	40.0
01343	Tuff Creek	6,016*	80	0	80.0
01344	Westfall	3,620	100	1.8	101.8
01345	Mountain Pasture	1,135	60	0	60.0
01348	J. Herbst Summer	2,385	160	0	160.0
01350	Wm Herbst Summer	699	15	0	15.0
01353	Campbell	2,845*	20	0	20.0
01356	Howard Pasture	1,637*	340	0	340.0
01360	Ruth Fuller Private	89	10	0	10.0
01365	Quien Sabe	5,781*	985	0	985.0

RESOURCE CONDITIONS IN THE BRIDGER MOUNTAIN LANDSCAPE MEET THE STANDARD?

Yes Upland acres meeting this standard = **71,494**

NO Upland acres not meeting this standard = **2,265**

YES Riparian/wetland acres meeting this standard = **130**

NO Riparian/wetland acres not meeting this standard = **11 (10.5)**

STANDARD # 2 - Riparian

Riparian and wetland vegetation has structural, age and species diversity characteristic of the stage of channel succession 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.

THIS MEANS THAT:

Wyoming has highly varied riparian and wetland systems on public lands. These systems vary from large rivers to small streams and from springs to large wet meadows. These systems are in various stages of natural cycles and may also reflect other disturbance that is either localized or widespread throughout the watershed. Riparian vegetation captures sediments and associated materials, thus enhancing the nutrient cycle by capturing and utilizing nutrients that would otherwise move through a system unused.

INDICATORS MAY INCLUDE BUT ARE NOT LIMITED TO:

- Erosion and deposition rate;
- Channel morphology and flood plain function;
- Channel succession and erosion cycle;
- Vegetative cover;
- Plant composition and diversity (species, age class, structure, successional stages, desired plant community, etc.);
- Bank stability;
- Woody debris and instream cover; and
- Bare ground and litter.

The above indicators are applied as appropriate to the potential of the ecological site. Members of BLM interdisciplinary Teams (IDTs) visited riparian areas throughout the BML to assess Proper Functioning Condition (PFC). This work was begun in 1998 and was continued in 2009, 2010 and 2011. Areas where PFC was assessed in 1998 were ground-checked in 2009 and 2010 for changes in condition and trend. Riparian areas rated PFC are also considered to be meeting Rangeland Health Standard #2.

Proper Functioning Condition assessments were conducted on approximately 130 miles of stream riparian habitat within the BML. These stream miles were divided into lengths with similar physical characteristics that are referred to as “reaches.” One of five possible ratings was assigned to each stream reach and wetland area:

- Proper Function Condition (PFC) = Meeting Rangeland Health Standard #2
- Functioning at Risk, Upward Trend (FARU) = Meeting Rangeland Health Standard #2
- Functioning at Risk, Trend not Apparent (FARN) = Not Meeting Rangeland Health Standard #2
- Function at Risk, Downward Trend (FARD) = Not Meeting Rangeland Health Standard

#2

- Non Functioning (NF) = Not Meeting Rangeland Health Standard #2

The following Tables: III-12 through III-15 give detailed information on all reach and spring or reservoir ratings:

Table III-12 PFC for Creeks and Drainages in the Lower Wind River Watershed

Major Stream	Minor Stream or local Spring Source	Stream Type	Miles/ Acres	Allotment	Reach ID	Date(s) Assessed	Vegetative Community Type	PFC/FAR (upward trend)	NF/FAR (static, down, not apparent)
Tough Creek	Main Fork	Intermittent	1.5/ 3.6	Tough Creek #01343	SP5100800 050502 - 02	1998	Grass/ Sedge/ Rush	X	
	West Fork	Intermittent	0.25/ 0.9	Tough Creek #01343	100800050 502-03	1998	Grass/ Rush	X	
Birdseye Creek	Main Channel	Perennial	1.0/ 1.8	Westfall #01344	S21008000 50501-01	1998, 2010	Cottonwood/ Cheatgrass or no understory		X
	Main Channel	Perennial	1.2/ 2.2	Westfall #01344	S21008000 50501-02	1998	Mesic Shrub/Grass	X	
	Unnamed West Tributary	Intermittent	0.7/ 2.1	J Herbst Summer #01348	S21008000 50501-03	1998	Grass/ Sedge/ Rush	X	
	Two Upper Tributaries	Perennial	2.8/ 3.4	J Herbst Summer #01348	S21008000 50501-04	1998	Grass/ Sedge/ Rush	X	

Table III-13 PFC for Creeks and Drainages in the Badwater Watershed

Major Stream	Minor Stream or local Spring Source	Stream Type	Miles/ Acres	Allotment	Reach ID	Date(s) Assessed	Vegetative Community Type	PFC/FAR (upward trend)	NF/FAR (static, down, not apparent)	
Reservoir Creek	Westfall Spring	Wet Meadow and Spring	.1/ 0.5	Westfall #01344	1008000 60406_0 1	1998	Sedge/Rush	X		
	Springs at upper forks of Reservoir Creek	Spring-Fed Wet Meadow	.5/ .7	Westfall #01344	1008000 60406_0 2	1998	Juniper/Shrub/Grass	X		
Hoodoo Creek	West Fork	Intermittent	1.0/ 2.0	Quien Sabe #01365	1008000 60406_0 2	1998	Juniper/Shrub/Grass	X		
Dry Creek	West Fork	Stream	.6/ 1.8	Hoodoo Creek #01324	1008000 60405_0 2	1998	Juniper/Shrub/Grass	X		
	Main and East Fork Tributaries	Stream	4.4/ 26.7	Top or Mountain #01358 And Below the Hill #01318	1008000 60404- 07	1998	Juniper/Willow/Sedge	X		
	Unnamed East Fork Tributaries	Stream	Stream	0.2/ 0.7	Myrtle Reed #01327	1008000 60404_0 3	1998	Mixed Shrub/ Grass/ Forb	X	
		Stream	Stream	0.9/ 6.5	Myrtle Reed #01327	1008000 60404_0 4	1998	Mixed Shrub/Juniper/ Grass	X	
		Stream	Stream	0.4/ 0.9	Myrtle Reed	1008000	1998	Mixed	X	

				#01327	60404_05		Shrub/Juniper/ Grass		
	Klondike Spring/ East Fork	Intermittent	.15/ .54	Battle Axe Berger #01331	SP5100800060404-09	2009	Grass/ Sedge/ Rush	X	
		Intermittent	.75/ 2.3	Battle Axe Berger #01331	S2100800060404-08	2009	Grass/ Sedge/ Rush	X	
	Battle Axe Spring	Intermittent	.15/ 0.27	Battle Axe Berger #01331	SP6100800060401-04	2009	Willow/Sedge	X	
Bridger Creek	South Bridger Creek	Stream	.25/ 0.5	Joe John's Pasture #01352	100800060301_01	2009	Grass/Shrub/ Forb	X	
	Greer Draw	Stream	.7 /1.3	Fuller Allotment #01323	100800060301_01	1998	Grass/Shrub	X	
	Poison Draw	Stream	1.4 / 1.7	Fuller Allotment #01323	100800060302_02	1998	Grass/ Rush		X
Lysite Creek	East Fork	Intermittent	0.2 / 1	Lysite Mountain Allotment #01323	100800060303_02	1998	Cottonwood/ Juniper/ Grass/Sedge	X	
		Intermittent	1.1 / 2.8	Lysite Mountain Allotment #01323	100800060303_03	1998, 2009	Cottonwood/ Juniper/ Mixed Shrub/ Grass/Sedge	X	
	Main Fork	Creek	1.1 / 5.3	Lysite Mountain Allotment #01323	100800060303_04	1998	Cottonwood/ Juniper/ Mixed Shrub/ Grass	X	
		Creek	1.5 / 3.6	Lysite Mountain Allotment #01323	100800060303_05	1998	Cottonwood/ Willow/Juniper/ Mixed Shrub/ Grass/Sedge/		X
		Creek	0.1 / 0.4	Lysite Mountain Allotment #01323	100800060303_06	1998	Grass/Sedge		X
Cottonwood Creek	Small Tributary	Spring and Intermittent	0.4 / 0.5	Cottonwood Pass #01310	100800060304_06	2009	Grass/Rush	X	
Sioux Creek	Main Fork and lower East and West Forks	Perennial	3.9 / 11.8	168 A Stock Driveway #01341	100800060103_03	1998, 2009	Cottonwood/ Grass/Sedge	X	
	East and West Fork	Perennial	2.5/ 2.03	168 A Stock Driveway #01341	100800060103_04	1998, 2009	Grass/Sedge/ Rush	X	

Table III-14 PFC for Creeks and Drainages in the Nowood Watershed

Major Stream	Minor Stream or local Spring Source	Stream Type	Miles / Acres	Allotment	Reach ID	Date(s) Assessed	Vegetative Community Type	PFC/FAR (upward trend)	NF/FAR (static, down, not apparent)
Crawford Creek	Main Fork	Perennial	0.6 / 0.36	Crawford Creek #01304	100800080101_01	2009	Grass/ Sedge	X	

Table III-15 PFC for Springs, Seeps and Wet Meadows in the BMGMA

Watershed	Spring / Seep/ Reservoir Name	Allotment	Reach ID	Acres	Date(s) Assessed	Vegetative Community Type	PFC/FAR (upward trend)	NF/FAR (static, down, not apparent)
Lower Wind River	Birdseye Reservoir	Tough Creek #01343	100800050502-04	2	1998	Willow/Grass	X	
	Unnamed meadow	Westfall #01344	100800050502_05	1	1998	Sedge/ Grass	X	
Badwater	Willow Spring	Battle Axe Berger #01331	100800060402-02	.5	2009	Willow/ Sedge/ Grass	X	
	Cowboy Spring	Fuller #01323	100800060402-04	.5	2009	Grass		X
	Fuller Peak Spring	Fuller #01323	100800060302_05	3	2009	Willow/ Sedge	X	
	Philp Reservoir	Lookout Hill #01355	100800060402_01	1.5	1998	Willow/Cattail/ Rush	X	
	Unnamed Spring	Cottonwood Pass #01310	100800060304_05	.5	2009	Grass/Sedge		X
	Unnamed Spring	Logan Pasture #01309	100800060103_07	1.5	2009	Sedge/Grass		X
	Unnamed Spring	Logan Pasture #01309	100800060103_08	.5	2009	Sedge/Grass		X

Approximately 91 percent of all riparian stream miles within the BML were rated PFC or FAR with and upward trend, nine percent FAR, no apparent trend or downward. No riparian was rated as non-functioning. All riparian reaches of Tough Creek, Reservoir Creek, Hoodoo Creek, Dry Creek, Cottonwood Creek Sioux Creek and Crawford Creek were rated PFC. Birdseye Creek has one reach that is FAR with trend not apparent and Lysite Creek has two reaches with FAR with a downward trend. More than half of springs, wet meadows and reservoirs assessed were in PFC. One area in Fuller grazing allotment two in Logan Pasture Allotment and one in Lysite Mountain Allotment were Functioning at Risk with downward or not apparent trends.

Remnants of old beaver dams and gnawed off trees are still visible reminders that beaver used to inhabit the streams in these mountains. Evidence of recent beaver activity was not noted on BLM administered land. Conifer encroachment into historical beaver habitat has played a role in altering the habitat, making it unsuitable for beaver. In addition to conifer encroachment, the lack

of suitable dam/lodge building material and preferred food sources appear to be limiting beaver repopulation in this area.



Figure 2: Examples of Riparian Health in the Bridger Mountain Landscape. The photo on the left is Fuller Peak Spring, in Proper Functioning Condition at T40NR91W Section 30 SE1/4NW1/4. The photo on the right is Cowboy Spring Functioning at Risk with Not Apparent Trend at T40NR91W Section 29 SW1/4SE1/4.

Table III-12 Estimated Acres by Allotment – Standard #2 (*Acres are within Bridger Mountain Landscape only)

Allotment Number	Allotment Name	Riparian acres not Meeting Standard #1
01309	Logan Pasture	2
01310	Cottonwood Pass	.5
01323	Fuller Allotment	2.2
01329	Lysite Mountain	4.
01344	Westfall	1.8

RESOURCE CONDITIONS IN THE BRIDGER MOUNTAIN LANDSCAPE MEET THE STANDARD?

YES Riparian Acres = 130

NO Riparian Acres = 11 (10.5)

STANDARD # 3 – Upland Vegetation

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.

THIS MEANS THAT:

In order to maintain desirable conditions and/or recover from disturbance within acceptable timeframes, plant communities must have the components present to support the nutrient cycle and adequate energy flow. Plants depend on nutrients in the soil and energy derived from sunlight. Nutrients stored in the soil are used over and over by plants, animals, and microorganisms. The amount of nutrients available and the speed with which they cycle among plants, animals, and the soil are fundamental components of rangeland health. The amount, timing, and distribution of energy captured through photosynthesis are fundamental to the function of rangeland ecosystems.

INDICATORS MAY INCLUDE BUT ARE NOT LIMITED TO:

- **Vegetative cover;**
- **Plant composition and diversity (species, age class, structure, successional stages, desired plant community, etc.);**
- **Bare ground and litter;**
- **Erosion (rills, gullies, pedestals, capping); and**
- **Water infiltration rates.**

The above indicators are applied as appropriate to the potential of the ecological site.

The 26 *Rangeland Health Indicator Evaluation Matrices* completed in 2009 and 2010 measured indicators for hydrology, soils, and biotic site integrity. These three characteristics of an ecological site are interactive and interdependent, but in general the indicators for the biotic integrity will pertain to Standard #3. Indicators for upland vegetation health include but are not limited to ground cover and canopy cover, plant community composition, functional/structural plant groups, plant mortality, annual production, reproductive ability, and the presence or absence of invasive plants in the community. Observations and data were compared to baseline data in Ecological Site Descriptions (ESD's) to provide supporting information for interpreting the biotic indicators. For summaries of the results of this process see Table III-16, Biotic Qualitative Assessment Summary.

As the table illustrates, the vast majority of the upland plant communities in the BML are meeting Standard #3. Upland sites where biotic integrity were found to be in the -none to slight- or -slight to moderate- departure from expected conditions for soils and hydrology will meet the standard. Sites that were found to be in moderate departure from expected conditions are subject to professional judgment depending on the factors influencing the departure. Sites found to be in moderate to extreme departure from expected conditions will not meet the standard.

Table III-16. Upland Qualitative Assessment Summary

Watershed	Ecological Site	Allotment Name and Number	Plant Community	Degree of Departure from Expected
				Biotic Integrity
Lower Wind River	Shallow Loamy 15-19 E	Mountain Pasture #01345	Bluebunch Wheatgrass/ Mixed Shrub	Slight to Moderate
	Coarse Upland 15-19 E	J Herbst Summer #01348	Idaho Fescue/ Mixed Shrub	Moderate
Badwater	Shallow Loamy 15-19 E	Joe John's Pasture #01352	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight
		Lysite Mountain #01329	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight
	Coarse Upland 10-14 SE	Westfall #01344	Mid Bunchgrass/ Big Sagebrush	Moderate
		Howard Pasture #01356	Mid Bunchgrass/ Big Sagebrush	None to Slight
			Short Grass/ Forbs	Moderate to Extreme
		Battle Axe Berger #01331	Shortgrass/ Forbs	Moderate
	Bitterbrush / Big Sagebrush		None to Slight	
	Shallow Loamy 10-14 SE	Quien Sabe #01365	Short Grass & Grasslike/Forbs	Moderate to Extreme
	Gravelly 10-14 SE	Top of Mountain #01358	Bluebunch Wheatgrass	Slight to Moderate
	Shallow Loamy 10-14 E	Fuller Allotment #01323	Bluebunch Wheatgrass/ Needleand-thread	None to Slight
			Perennial Grass / Mixed Shrub	Slight to Moderate
		Summer Allotment #01357	Bluebunch Wheatgrass/ Needleand-thread	None to Slight
		Campbell #01353	Perennial Grass / Mixed Shrub	Moderate
		Lysite Mountain #01329	Bluebunch Wheatgrass/ Needleand-thread	Slight to Moderate
		Cottonwood Pass #01310	Bluebunch Wheatgrass/ Needleand-thread	Slight to Moderate
		Lybyer North #01305	Perennial Grass / Mixed Shrub	Moderate

	Loamy 10-14 E	Campbell #01353	Mixed Shrub/ Bare Ground	Moderate to Extreme
	Coarse Upland 10-14 E	168 A Stock Driveway #01341	Perennial Grass /Mixed Shrub	None to Slight
Nowood	Shallow Loamy 15-19 E	Henrich Pasture #01367	Bluebunch Wheatgrass/ Mixed Shrub	Slight to Moderate
		Crawford Creek #01304	Bluebunch Wheatgrass/ Mixed Shrub	Slight to Moderate
		167A Scott-Robson #01308	Bluebunch Wheatgrass/ Mixed Shrub	Moderate
	Loamy 15-19 E	Cottonwood Pass #01334	Idaho Fescue/ Big Sagebrush	Slight to Moderate
			Idaho Fescue/ Big Sagebrush	None to Slight
		Crawford Creek #01304	Dense Shrub/ Bluegrass	Moderate

On a broad scale, using soil mapping units, taking the most common ecological site found on each unit, an ecological site can be assigned across large areas of the landscape. This is the basic information shown in Map 2.

For each of these Ecological Sites there is an Ecological Site Description (ESD) developed by the Natural Resources Conservation Service (NRCS). The ESDs provided by the NRCS help the interdisciplinary teams understand the relationships between the various plant communities that may be found at the sites and the Fundamentals of Rangeland Health. They also provide the reference sheets that define expected conditions so that ID Teams can determine a degree of departure from expected conditions for the Seventeen Indicators of Rangeland Health for each Ecological Site.

The ESDs describe and diagram State and Transition Models for the various plant communities that might exist on each ecological site. ESDs are works in progress and as such are subject to revision and interpretation by professionals in fields such as Rangeland Management, Hydrology, Wildlife Biology and Soil Science. The current ESDs for the Bridger Mountain Landscape describe certain plant communities as Historic Climax Plant Communities (HCPC).

HCPC is a theoretical end point in a succession model. There are other plant communities that are adapted to the site that are also ecologically functional and may be economically or ecologically desirable for the site. The narratives in the ESDs that describe the various plant communities that may be present on the site have additional information regarding whether the communities are functional or impaired. These narratives help guide the ID Team in determining whether an ecological site or certain acres within an ecological site meet or do not meet Standard #3.

Generally speaking, for the ecological sites in the BML, plant communities at HCPC will include cool season native bunch grasses as a major component. Examples of HCPC communities are

Mid Bunchgrass/Big Sagebrush, Bluebunch Wheatgrass, or Bluebunch Wheatgrass/ Needleandthread.



Figure 3: Examples of upland vegetation health on upland range in the Bridger Mountain Landscape. Both photos were taken in the Copper Mountain Wilderness Study Area. The photo on the left and the foreground in the photo on the right represent those parts of the BML that contain healthy shallow loamy rangeland ecological types. For the sites pictured above, the abundance of bluebunch wheatgrass, a native cool season bunch grass easily place them in HCPC according to the ESDs and professional judgment.

The predominate alternate stable states in the BML also contain cool season native bunch grasses, such as bluebunch wheatgrass, Needleandthread, or Idaho fescue as a major component, but include a higher percentage of shrubs and other grasses than the HCPC communities. These are healthy and functioning communities and they meet the standard. These stable states are described in the ESDs as Perennial Grass/Mixed Shrub, Bluebunch Wheatgrass/ Mixed Shrub, Idaho Fescue/Mixed Shrub, or Idaho Fescue/Big Sagebrush communities.



Figure 4: The photo on the left shows a Bluebunch Wheatgrass/Mixed Shrub plant community on a Shallow Loamy 15-19" East Precipitation Zone Ecological Site. The photo on the right shows a Bluebunch Wheatgrass/Needleandthread plant community on a 10 -14" East Precipitation Zone Ecological Site.

An alternate stable state that can be found on rangelands in the BML is a Dense Shrub/Bluegrass stable state. These are states where the cool season bunch grasses such as bluebunch wheatgrass and Needleandthread grass have been replaced by bluegrasses. These states are generally less productive than those with non-bluegrass bunchgrasses. But if they are comprised of good producers such as mutton bluegrass they are functional, stable communities and meet the standard.

Stable states that do not meet Standard #3 are where the biotic community has been compromised or is reduced although it is stable. One such stable state is the Short Grass community. When compared to the Historic Climax Plant Community in the Ecological Site Descriptions or the plant community the ID Team would expect to see on the dominant ecological sites in this landscape (Shallow Loamys, Course Uplands, and Gravellys in the 10 to 14" precipitation zone) there is a substantial decrease in large cool season bunch grasses such as bluebunch wheatgrass and an increase in short, turf-forming grasses or grass-like sedges such as blue gramma or thread leaf sedge, and in small unpalatable bunchgrasses such as Sandburg's bluegrass or prairie june grass. The shrub component is also reduced. This results in lower productivity for the site. This lower quality vegetative community interacts with and affects Standard #1- Soils. The watershed is functioning in some cases and parts of the area may pass the soils standard; however, over time the soils may be at risk and in some cases topsoil has already been lost. For the reasons described above, it is estimated that 2,845 acres do not meet Standard #3 in the BML due to being in some form of Short Grass community. Short Grass communities found in the BML as described in the USDA- NRCS Ecological Site Descriptions include Short Grass/Forb, Blue Grama/Sod, Short Grass and Grasslike/Forbs.



Figure 5: A Short Grass/Forb plant community in the Course Upland 10-14” Precipitation Zone Ecological Site.

A second kind of alternate stable state that does not meet Standard #3 is a state in which the shrub component has become dominant and there is no longer a vigorous, functioning understory to provide forage, water infiltration, or ground cover. According to the ESDs and in the professional opinion of the ID Teams there is a substantial departure from the HCPC not so much in that shrubs have increased, but that in cool season bunch grasses such as bluebunch wheatgrass have almost entirely disappeared from the community. In the BML, these communities are identified as Sagebrush/Bare Ground, or Mixed Shrub/Rhizomatous Grass communities. This kind of stable state is dominated by shrubs and has either a bare ground understory or an understory of rhizomatous, annual or short grasses. Where these communities were found, the soils are at risk for increase erosion, infiltration is reduced, and runoff is increased. Shrubs, primarily sagebrush, comprise much of the production by weight on permanent transects. Sagebrush quantity may be high while quality is low. Sagebrush communities may be composed of predominantly low vigor mature and decadent plants. Plant recruitment appears limited as few seedlings or young plants are found throughout the area. Herbaceous plants are present in the understory but not typically in the desired amounts. It is estimated that 800 acres do not meet Standard #3 in the BML due to dominance of shrubs and an unsatisfactory understory.



Figure 6: Examples of Sagebrush/Bare Ground plant communities.

A third kind of stable state that does not meet Standard #3 is an annual plant community. In the BML this is observed in cheatgrass dominated areas. Plant diversity is greatly altered, with cheatgrass, an invasive annual, the major plant component. Cool season bunchgrasses such as bluebunch wheatgrass or Needleandthread grass are rare to non-existent in the community and shrubs such as big sagebrush have also been removed. Some small bluegrasses may be present under the cheatgrass canopy. Many of the ESDs do not describe this community, however, a Bluegrass/Annual plant community described under Course Uplands 15-19” East, was used for a reference for describing the effect this plant community has on uplands. It is estimated that 1,015 acres do not meet Standard #3 in the BML due to having become cheatgrass dominated.

Table III-17 breaks down acres that do not meet Standard #3 by the ecological sites where those acres are found and compares the plant communities found on the failing sites with the functioning communities that would be expected or desired on the sites. These are *estimated* acres, derived by direct observation, by extrapolation using GIS layers and measuring tools, and by interpretation of data.

Table III-17 Standard # 3 Acres by Ecological Site and Plant Communities

Ecological Site	Acres Meeting Standard	Acres Not Meeting Standard - Plant Community Descriptors – Why These Acres Do Not Meet the Standard
Cl 10-14 HPSE	103	
CoUp 10-14 HPSE	1,897	1,520-Acres Short Grass/ Forb community, 125 Acres Cheatgrass Dominated - A functioning community on this site would have a greater component of perennial cool-season bunchgrasses, such as blue bunch wheatgrass, and native shrubs, such as sagebrush.
Gr 10-14 HPSE	8,133	790 Acres Blue Grama/ Sod - A functioning community on this site would have a greater component of perennial cool-season bunchgrasses, such as blue bunch wheatgrass, and native shrubs, such as sagebrush.
Ly10-14 HPSE	1,502	160 Acres Big Sagebrush/Bare Ground, 400 Acres Cheatgrass Dominated - A functioning community on this site would have a greater component of perennial cool-season bunchgrasses, such as rhizomatous wheatgrasses or Needleand thread, or other mid-size grasses and where cheatgrass is dominant there would be more native shrubs, such as sagebrush.
LyOv 10-14 HPSE	0	98 Acres Cheatgrass Dominated - A functioning community on this site would have a greater component of perennial grasses, such as wheatgrasses or Kentucky bluegrass. Some woody plants and perennial forbs along with some annuals would also be present.
SwCl 10-14 HPSE	574	
SwLy 10-	5,597	260 Acres Cheatgrass Dominated, 505 Acres Short Grass/ Forbs,

14 HPSE		and 240 Acres Sagebrush/Rhizomatous Wheatgrass - A functioning community on this site would have a greater component of perennial cool-season bunchgrasses, such as blue bunch wheatgrass and Needleandthread, and where cheatgrass or short grasses are dominant there would be more native shrubs, such as sagebrush.
SwSy 10-14 HPSE	430	
Ly 10-14 E	535	90 Acres Big Sagebrush / Bare Ground- A functioning community on this site would have a greater component of perennial cool-season bunchgrasses, such as blue bunch wheatgrass, rhizomatous wheatgrasses.
SwLy 10-14 E	22,076	145 Acres Cheatgrass Dominated- 30 Acres Grasslike/Forb - A functioning community on this site would have a greater component of perennial cool-season bunchgrasses, such as blue bunch wheatgrass and Needleandthread, and native shrubs, such as sagebrush.
Ly 15-19 E	2,441	20 Acres Cheatgrass Dominated - A functioning community on this site would have a greater component of perennial cool-season grasses, such as Idaho fescue, Columbia needlegrass, or spikefescue and native shrubs, such as sagebrush.
Swly 15-19 E	7,671	30 Acres Cheatgrass Dominated - A functioning community on this site would have a greater component of perennial cool-season grasses, such as Idaho fescue, Columbia needlegrass, or spikefescue and native shrubs, such as sagebrush.

Table III-18 lists upland and acres not meeting Standard #3 by grazing allotment. These are *estimated* acres and are derived by direct observation, by extrapolation using GIS measuring tools, and topographic maps, and by interpretation of data. Where patterns follow ecological site boundaries, and effects vary between allotments, percentages of ecological sites affected were estimated within grazing allotments.

Table III-18 Estimated Acres by Allotment – Standard #3

(*Acres are within Bridger Mountain Landscape only)

Allotment Number	Allotment Name	BLM Acres in BML*	Acres failing Standard #3 due to Short Grass Type Community Types as Described in USDA-NRCS Ecological Site Descriptions	Acres Failing Standard #3 due to Sagebrush/ Bare Ground Community Types as Described in USDA-NRCS Ecological Site Descriptions	Acres failing Standard #3 due to Cheatgrass Dominant Plant Community Compare to Bluegrass/Annual Community Type as Described in USDA-NRCS Ecological Site Descriptions	Total Acres failing Standard #3
01310	Cottonwood Pass	2,317	30	0	40	70
01306	Canning	347	0	0	5	5
01323	Fuller Allotment	3,050	0	0	100	100
01324	Hoodoo Creek	2,438*	57	0	80	155
01326	Lichtenstein	1,342*	250	0	20	300
01327	Myrtle Reed	1,213	20	0		20
01329	Lysite Mountain	8,194	0	0	30	30
01331	Battle Axe Berger	7,270*	780	0	40	820
01343	Tuff Creek	6,016*	0	0	80	80
01344	Westfall	3,620	300	0	60	360
01345	Mountain Pasture	1,135	0	0	60	60
01348	J. Herbst Summer	2,385	0	0	160	160
01350	Wm Herbst Summer	699	0	0	15	15
01353	Campbell	2,845*	0	490	20	510
01356	Howard Pasture	1,637*	180	0	160	340
01360	Ruth Fuller Private	89	0	0	10	10
01365	Quien Sabe	5,741	1230	0	85	1315

RESOURCE CONDITIONS IN THE BRIDGER MOUNTAIN LANDSCAPE MEET THE STANDARD?

YES Acres = 69,434

NO Acres = 4,355

STANDARD #4

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.

THIS MEANS THAT:

The management of Wyoming rangelands will achieve or maintain adequate habitat conditions that support diverse plant and animal species. These may include listed threatened or endangered species (U.S. Fish and Wildlife-designated), species of special concern (BLM-designated), and other sensitive species (State of Wyoming-designated). The intent of this standard is to allow the listed species to recover and be delisted, and avoid or prevent additional species becoming listed.

INDICATORS MAY INCLUDE BUT ARE NOT LIMITED TO:

- Noxious weeds;
- Species diversity;
- Age class distribution;
- All indicators associated with the upland and riparian standards;
- Population trends; and
- Habitat fragmentation.

The above indicators are applied as appropriate to the potential of the ecological site.

Big Game- Pronghorn, Mule Deer and Elk

Much is known about wildlife population trends in the BML. Pronghorn and elk herds are thriving. Mule deer populations have declined in recent decades, but have rebounded somewhat. The population objective for the Badwater Pronghorn herd is set at 3,000 pronghorn, and the current population is estimated at over 4,000. There appears to be a good mix of winter, summer and transitional habitat to support existing populations and objective levels of pronghorn.

Mule deer thrive in a variety of habitats ranging from desert shrubland to alpine tundra. This species achieved maximum abundance during the 1950s and 1960s throughout most of the range. Since then mule deer have declined across the western United States. The most recent declines occurred during the early 1990's and were likely due to the combined effects of drought and severe winters. Severe winters of 1992/93 and 2001/02 and several dry summers have kept deer populations suppressed. Historically, mule deer were common in the BML and even though they are still common, the current mule deer population in the Southwest Bighorn herd unit is about 20 percent below the population objective. Trend count information (fawn: doe ratio) from WGFD has shown a steady increase in fawn production over the past 20 years, although the herd size remains below population objectives.

Currently, elk are doing well across Wyoming and the BML. Elk numbers throughout the LFO are over the population objective established by WGFD. The population objective for the South

Bighorns Elk herd is set at 2,900, with the current population (2010) estimated at over 7,000. This indicates that the elk in this area have successful reproductive rates and survival rates and have the habitat to support them. In general, there are no significant problems with any elk seasonal habitats including parturition areas.

Non- game Wildlife Species and Upland Game Birds

Non-game wildlife abundance and species diversity is below potential on some wetland-riparian habitat types in the BML. In general, habitat conditions are considered adequate to sustain non-game wildlife populations and upland game birds. However, non-game wildlife and game birds will be negatively affected anywhere uplands or riparian areas do not meet Rangeland Health Standards.

Greater sage grouse

Greater sage grouse are monitored throughout the area by WGFD and BLM wildlife biologists to determine the activity status at each lek. Most sage-grouse declines in Wyoming occurred between 1965 and the 1990s. Lek count numbers generally increased from the mid-1990s to 2008 throughout the field office, although annual counts on individual leks varied dramatically. There are six leks within the BML, but only three of these leks have been active in recent years (Map # 6). Over the past decade (2001-2010) peak counts of male sage grouse on these three leks occurred in 2005, 2007 and 2009.

Habitat Conditions in the BML

Range conditions on upland and riparian habitats are stable or improving in most areas. Native plant species are still present and weeds, although present in some areas, have not taken over large areas of rangeland. Impacts from off highway vehicle use and loss of or modification to habitats from developments on private land in mixed land ownership areas have been minimal. Traditional use of the land, particularly livestock grazing, continues to be the primary use on the landscape.

In general, the shrub community in the BML is adequate to support a viable population of pronghorn. Current data also suggest that the sagebrush habitat in the area has a reasonable age structure in most areas with adequate regeneration inter mixed among old-aged/decadent stands of brush. The big sagebrush communities that pronghorn depend on are generally healthy. High cover and density of shrubs that limit understory species is observed at higher elevations and precipitation. In this assessment area the pronghorn crucial winter range does not receive enough concentrated use to show high utilization or plants that are severely hedged from long term heavy use.

Mule deer crucial winter range is a somewhat different story. The majority of the BML is mapped as crucial mule deer habitat so the age structure, composition and condition of the shrub communities can affect the carrying capacity of mule deer. Shrubs make up the majority of mule deer diet throughout the year with shrub use increasing during the winter months. Consequently, trends in mule deer populations may be highly affected by conditions on winter ranges. Crucial winter range in the BML covers 51 percent of the area and a few areas exhibit characteristics of unacceptable habitat.

While most browse transects in mule deer habitat have not shown extensive high utilization and hedging, low reproduction and vigor, or overall decadence, browse transect data from seven sites indicated that 75-100 percent of the browse was moderately to heavily utilized (Appendix D). On 13 sites the age structure of these shrub communities indicates even-aged stands of sage brush with poor or little regeneration. Based on browse transect data, and ID Team observation, GIS measuring tools and topographic maps, approximately 3,580 acres of mule deer crucial winter range contains sagebrush with excessive canopy cover or that has been severely hedged. In addition 490 acres of sagebrush has little or no herbaceous vegetation in the understory. Some of these locations in mule deer crucial winter range are also in the greater sage grouse habitat, including Core Area. Consequently, 4,070 acres do not meet Standard #4.

Elk crucial winter ranges and transition range within the BML is generally not at a desired future condition. Elk prefer areas with Historical Climax Plant Communities or other, similar plant communities that would provide abundant grass for grazing. Some unsuitable habitat areas may overlap with areas that do not meet Rangeland Health Standards. Areas that provide poor mule deer habitat and do not meet Standard #4 due to low quality, decadent sagebrush stands would also provide adequate habitat for elk. In addition to providing hiding cover, many of the dense stands of sagebrush in the BML also contain forbs and grasses in the understory.

Short Grass/Forb or Blue Grama/Forb plant communities also provide poor wildlife habitat. Blue grama which is a shallow rooted warm season species is dominant in the understory in many of these areas. This species forms dense mats in the understory that prohibit the establishment of native bunchgrasses. Cheatgrass is also a common invasive species that offers little benefit to wildlife. Within cheatgrass dominated areas, sagebrush communities are composed predominantly of low vigor mature individuals that are often dwarfed in stature and are often heavily browsed. Much of the area within these plant communities contains mule deer crucial winter range. Herbaceous plants are present in most vegetative communities, but of those portions of the BML that are not meeting Standard #3 herbaceous plants are typically not present in the desired amounts. Grasses and forbs are essential for the breeding, nesting, and foraging requirements of many nongame mammals, birds, sage grouse and big game. Sage grouse are dependent on herbaceous plants under the sage brush canopy for cover and young birds require a diet high in protein that is acquired through ingesting forbs and insects. For these reasons, the acres that fail Standard #3 also fail Standard #4.

Mixed shrub/bare ground plant community were found in the vicinity of three sage-grouse leks. Sage-grouse utilize the area for breeding and nesting. Sage grouse hens will generally nest within a few miles of a lek. The lack of adequate herbaceous cover described under Standard #3 is adversely impacting the quantity and quality of suitable nesting habitat within these areas. Those acres that fail Standard #3 due to lack of understory vegetation will also fail Standard #4 due to inadequate wildlife habitat. Although only 32 percent of the BML is within Core Area, research has shown that sage grouse utilize a much larger area in the BML. The reduced amount of forb production, and lack of adequate herbaceous cover described under Standard # 3 adversely impacts the quantity and quality of suitable nesting habitat. For these reasons as well as those stated above, all acres that fail #3 also fail Standard #4.

Riparian habitats are capable of supporting the greatest variety of birds and mammals due to the presence of water and the species and structural diversity of the plant community. Wildlife diversity in upland habitats is significantly affected by the health of the nearby riparian areas as many species are dependent on both upland and riparian habitats to meet their forage, birthing and cover requirements. The conditions discussed under Standard #2 where there is a failure to meet the standard indicate that riparian areas have shrunk in size and/or have become degraded and now have inappropriate plant communities. These conditions reduce the amount of available habitat for sage-grouse and other wildlife, and subsequently, reduce the kinds and numbers of animals these areas can support. Some of the riparian areas that fail Standard #2 are located in sage-grouse Core Area. Riparian habitat that is not in proper functioning condition probably does not provide the forage, cover and water requirements necessary for sage-grouse chick survival and successful summer and fall brood rearing. Those acres that fail Standard #2 due to non-functioning condition of riparian areas will also fail Standard #4 due to failure to provide adequate wildlife habitat.

Utah or Rocky Mountain Juniper woodland habitat are open (10-15 percent tree cover), seven to 15 foot tall woodlands of pure juniper. They are confined to the BML where they occur at 5,500-6,800 ft. on warm, dry foothills with shallow, sandy or rocky soils, near cliffs and rock outcrops, and on rocky mountain slopes. Juniper woodlands usually are associated with big sagebrush-mixed grass, and big sagebrush steppes. These areas provide excellent cover for big game and other wildlife species. Encroachment of juniper into areas with deeper soils is resulting in the loss of herbaceous vegetation in some areas. The lack of fire has contributed to mature and decadent shrubs in some areas. Juniper provides cover for wildlife species and appears naturally occurring on the rockier, steeper hillsides. No habitat areas were failed because of juniper encroachment. Quantifying the juniper encroachment or prescribing treatment is beyond the scope of this document; however, juniper control is a need that has been expressed by wildlife managers for the Bridger Mountain Landscape.

Noxious Weeds

The Bridger Mountain Landscape is relatively free of noxious weeds except along travel corridors and waterways. Many weeds are confined to irrigated private land or disturbed areas such as pipelines, oil and gas development pads, and roadways. However, any acres affected by noxious weeds cannot pass this Standard. It is estimated that 74 acres of public land in the BML are affected by Wyoming Weed and Pest Control designated noxious weeds.

Allotment Number	Allotment Name	BLM Acres in BML*	Acres Failing Standard 4 due to Noxious Weeds	Acres Failing Standard #4 Due to Insufficient Sagebrush Understory/Decadent Sagebrush Stands	Acres failing Standard 4 due to also failing Standards 2 or 3	Total Acres failing Standard #4
01304	Crawford Creek	2342	6	160	0	166.0
01309	Logan Pasture	2,578*	0	250	2.0	252.0
01310	Cottonwood Pass	2,317	0	300	70.5	370.5

Allotment Number	Allotment Name	BLM Acres in BML*	Acres Failing Standard 4 due to Noxious Weeds	Acres Failing Standard #4 Due to Insufficient Sagebrush Understory/Decadent Sagebrush Stands	Acres failing Standard 4 due to also failing Standards 2 or 3	Total Acres failing Standard #4
01318	Below the Hill	2,548	0	80	80	80.0
01323	Fuller Allotment	3,050	10	250	102.2	362.2
01324	Hoodoo Creek	2,438*	0	0	155	155.0
01326	Lichtenstein	1,342*	0	0	270	270.0
01327	Myrtle Reed	1,213	0	0	20	20.0
01329	Lysite Mountain	8,194	0	640	34.75	674.75
01331	Battle Axe Berger	7,270*	7	350	820	1177.0
01334	Cottonwood Pass	3,890	2	400	0	402.0
01341	168A Stock Driveway	699*	10	0	0	10.0
01343	Tuff Creek	6,016*	3	0	80	83.0
01344	Westfall	3,620	5	80	361.8	446.8
01345	Mountain Pasture	1,135	0	100	60	160.0
01347	Jones Creek Basin	1,292	0	400	0	400.0
01348	J. Herbst Summer	2,385	0	120	160	350
01350	Wm Herbst Summer	699	2	0	15	17
01353	Campbell	2,845*	12	800	510	832.0**
01354	Stinking Well	550*	4	0	0	4.0

Allotment Number	Allotment Name	BLM Acres in BML*	Acres Failing Standard 4 due to Noxious Weeds	Acres Failing Standard #4 Due to Insufficient Sagebrush Understory/Decadent Sagebrush Stands	Acres failing Standard 4 due to also failing Standards 2 or 3	Total Acres failing Standard #4
01355	Lookout Hill	568*	3	0	0	3.0
01356	Howard Pasture	1,637*	0	100	340	440.0
01360	Ruth Fuller Private	89	0	0	10	10.0
01365	Quien Sabe	5,741	7	0	1315	1322.0
01366	Cabin Pasture	265	3	40	0	43.0

RESOURCE CONDITIONS IN THE BRIDGER MOUNTAIN LANDSCAPE MEET THE STANDARD?

YES Acres = 74,134

NO Acres failing Standards #2 = 11 (10.5)

NO Acres failing Standards #3 = 4,355

NO Acres failing because of noxious weeds = 74

NO Acres failing because of excessive sagebrush canopy cover /decadent sagebrush stands = 4,070

**Includes acres failed under Standard #3 in Sagebrush/Bare Ground community.

NO Total Acres Failing Standard #4 = 8050

STANDARD #5

Water quality meets state standards.

THIS MEANS THAT:

The State of Wyoming is authorized to administer the Clean Water Act. BLM management actions or use authorizations will comply with all Federal and State water quality laws, rules and regulations to address water quality issues that originate on public lands. Provisions for the establishment of water quality standards are included in the Clean Water Act, as amended. Regulations are found in Part 40 of the Code of Federal Regulations and in *Wyoming's Water Quality Rules and Regulations*. The latter regulations contain Quality Standards for Wyoming Surface waters.

Natural processes and human actions influence the chemical, physical, and biological characteristics of water. Water quality varies from place to place with the seasons, the climate, and the kind of substrate through which water moves. Therefore, the assessment of water quality takes these factors into account.

INDICATORS MAY INCLUDE BUT ARE NOT LIMITED TO:

- Chemical characteristics (e.g., pH, conductivity, dissolved oxygen);
- Physical characteristics (e.g., sediment, temperature, color);
- Biological characteristics (e.g., macro- and micro-invertebrates, fecal coliform, and plant and animal species).

RESOURCE CONDITIONS IN THE ALLOTMENT MEET THE STANDARD?

UNKNOWN

RATIONALE: There are no streams located in the BML which are currently listed on the State of Wyoming's impaired water body or monitoring list. Additionally, the BML contains no part of a watershed of any streams listed as impaired or that occur on the state's stream monitoring list.

STANDARD #6

Air quality meets state standards.

THIS MEANS THAT:

The State of Wyoming is authorized to administer the Clean Air Act. BLM management actions or use authorizations will comply with all Federal and State air quality laws, rules, regulations and standards. Provisions for the establishment of air quality standards are included in the Clean Air Act, as amended, and the Wyoming Environmental Quality Act, as amended. Regulations are found in Part 40 of the Code of Federal Regulations and in *Wyoming Air Quality Rules and Regulations*.

INDICATORS MAY INCLUDE BUT ARE NOT LIMITED TO:

- Particulate matter;
- Sulfur dioxide;
- Photochemical oxidants (ozone);
- Volatile organic compounds (hydrocarbons);
- Nitrogen oxides;
- Carbon monoxide;
- Odors; and
- Visibility.

RESOURCE CONDITIONS IN THE ALLOTMENT MEET THE STANDARD? YES

RATIONALE: No known violations of state air quality standards exist.

APPENDIX A:

FIELD TOUR JUNE 16 & 17 2010

Participants:

Jim Cagney, BLM, Field Manager, Lander Field Office
Rubel Vigil, BLM, Assistant Field Manager for Resources
Judi Mott, BLM, Rangeland Management Specialist, Project Lead
Greg Bautz, BLM, Soils Specialist
Jim Wolf, Resource Advisor (Biological Resources)
Jessica Crowder, Wyoming Department of Agriculture, Senior Policy Analyst
Rachel Mealor, University of Wyoming, Extension Range Specialist
Mike Smith, University of Wyoming,
Carey Dobey, Wyoming Game and Fish, Habitat Biologist
Jim Haverkamp, NRCS, Rangeland Management Specialist

Upland sites visited were at the same locations as the following transects:

01339-T1
01334-T1
01329-T1
01353-T2
01323-T1
01356-T2
01365-T3
01348-T2

The tour was a quick and general overview of the Landscape. Riparian areas on BLM lands were located in hard to reach areas so much of the riparian areas observed were on private lands and were included for discussion purposes only. Stops were quick and discussion of the 17 indicators was inclusive of all group members. General conclusions were that upland sites the group visited would meet Standards #1, and #4, and riparian sites would meet Standard #2 and #4. Consensus was not always reached regarding Standard #3. Agreement was hardest to reach in areas with blue grama beds or cheatgrass. Otherwise, the sites that were visited were generally thought to be meeting Standard #3.

APPENDIX B:

SOIL MAPPING UNITS IN THE BRIDGER MOUNTAIN LANDSCAPE

High Elevation Soils								
SMU	Complex or Association	Elevation	Parent Material	Major Soil types and percentages	Location	Rooting Depths	Ecological Sites	Hazard of Erosion
127	Chittum-Bachus-Rock outcrop association, hilly	6,800 to 8,500 ft	Quartzitic sandstone	35 percent Chittum loam	hillslopes	8-20 "	Shallow Loamy 15 to 19, Foothills and Mountains East	Water- moderate
				30 percent Bachus loam	Dip slopes on cuestas	20-40"		Loamy, 15 to 19 inch, Foothills and Mountains East
							Water- severe	
				Wind - moderate				
180	Pensore-Rock Outcrop complex, hilly	6,000 to 7,500 ft	limestone	55 percent Pensore very channery loam	Sideslopes of hills and ridges	10-20 "	Shallow Loamy 10 to 14, Foothills and Basins East	Water- severe
				Wind- slight				
182	Pesmore-Rock outcrop-Asholler complex, steep	6,300 to 8,000 ft	Schist and gniess	50 percent Pesmore very channery sandy loam	Backslopes of hills and ridges, mountain-sides	20- 40"	Gravelly, 10 to 14, High Plains Southeast	Water- severe
				15 percent Asholler channery loam	Ridges and hills	6-20"		Shallow Loamy, 10 to 14, High Plains Southeast
							Water- severe	
				Wind - slight				
195	Rock outcrop-Asholler complex, steep	6,300 to 8,000 ft	schist	15 percent Asholler very channery loam	hills and ridges, mountains	6-20"	Shallow Loamy, 10 to 14, High Plains Southeast	Water- high
				Wind - slight				
198	Rock outcrop-Mosroc complex, hilly	7,000 to 8,000 ft	granite	35 percent Mosroc gravelly loam	mountains ridges, and hillslopes	9-20"	Shallow Igneous, 10 to 14, Foothills and Basins West	Water- moderate
				Wind - slight				
209	Starman-Rock outcrop-Woosley complex	6,800 to 9,000 ft	limestone	50 percent Starman very gravelly loam	Summit of hills, ridges and mountains	8-20"	Shallow Loamy 15 to 19, Foothills and Mountains East	Water- moderate
				15 percent Woosley loam	Side slopes of mountains	20-40"		Loamy, 15 to 19 inch, Foothills and Mountains East
							Water- severe	
				Wind - moderate				

Mid Elevation Soils

SMU	Complex or Association	Elevation	Parent Material	Major Soil types and percentages	Location	Rooting Depths	Ecological Sites	Hazard of Erosion
148	Forelle-Poposhia association, 2 to 12 percent slopes	5,300 to 7,500 ft	various	45 percent Forelle loam	Fan aprons	60 " or more	Loamy, 10 to 14, High Plains Southeast	Water-slight
				Wind - moderate				
			40 percent Poposhia loam	toe slopes and fan aprons	60 " or more	Clayey, 10 to 14, High Plains Southeast	Water-moderate	
				Wind - moderate				
209	Starman-Rock outcrop-Woosley complex, steep	6,800 to 9,000 ft	limestone	50 percent Starman gravelly loam	summit of hills, ridges and mountains	8-20"	Shallow Loamy, 15 to 19 inch, Foothills and Mountains East	Water-moderate
				Wind - slight				
			15 percent Woolsey loam	side slopes of mountains	20- 40"	Loamy, 15 to 19 inch, Foothills and Mountains East	Water-severe	
				Wind-moderate				
211	Thermopolis-Sinkson association, hilly	5,500 to 7,800 ft	Sandstone or siltstone	60 percent Thermopolis loam	hills and ridges	6-20"	Shallow Loamy, 10 to 14, Basins and Foothills East	Water-severe
				Wind-moderate				
			20 percent Sinkson loam	Fan aprons	60 " or more	Loamy, 10 to 14, Basins and Foothills East	Water-moderate	
				Wind - moderate				
221	Woosley-Decross-Starman association, rolling	6,800 to 9,000 ft	limestone	40 percent Woosley loam	mountain-sides	20- 40"	Loamy, 15 to 19 inch, Foothills and Mountains East	Water-moderate
								Wind - moderate
			various	30 percent Decross loam	fan aprons and toe slopes	60 " or more	Loamy, 15 to 19 inch, Foothills and Mountains East	Water-moderate
								Wind - moderate
			limestone	15 percent Starman gravelly loam	hills and mountains	10- 20"	Shallow Loamy, 15 to 19 inch, Foothills and Mountains East	Water-moderate
								Wind - slight

Low Elevation Soils

SMU	Complex or Association	Elevation	Parent Material	Major Soil types and percentages	Location	Rooting Depths	Ecological Sites	Hazard of Erosion
117	Blackhall-Carmody association, hilly	5,500 to 7,000 ft	sandstone	45 percent Blackhall fine, sandy loam	Hills, ridges and knobs	6-20 “	Shallow Sandy, 10 to 14, High Plains Southeast	Water-severe
				35 percent Carmody fine, sandy loam	hills	20-40”		Wind – severe
118	Blazon-Rock outcrop-Carmody complex, hilly	5,300 to 7,000 ft	shale	50 percent Blazon clay loam	hills and ridges	4-20 “	Shallow Clayey, 10 to 14, High Plains Southeast	Water-severe
			sandstone	15 percent Carmody gravelly sandy loam	hills and ridges	20– 40”		Wind – moderate
135	Crago-Pensore association, undulating	5,300 to 7,000 ft	limestone	60 percent Crago gravelly loam	Fan aprons, foot slopes, and piedmonts	60” or more	Gravelly, 10 to 14, High Plains Southeast	Water-slight
				20 percent Pensore very channery sandy clay loam	Summit and shoulder slopes of hills and ridges	10-20”		Wind - moderate
136	Cragosen-Carmody-Blazon complex, hilly	6,000 to 7,500 ft	Sandstone and conglomerate	50 percent Cragosen gravelly loam	Summit of hills and ridges	6-20”	Shallow Loamy, 10 to 14, High Plains Southeast	Water-severe
			sandstone	20 percent Carmody gravelly sandy loam	Summit of hills and ridges	20– 40”		Wind – slight
			shale	15 percent Blazon sandy clay loam	Backslopes of hills and ridges	4-20 “	Sandy, 10 to 14, High Plains Southeast	Water-severe
141	Dahlquist-Rock River complex, 1 to 12 percent slopes	6,000 to 7,500 ft	various	55 percent Dahlquist very cobbly loam	Fan aprons, and fan piedmonts	60” or more	Coarse Upland, 10 to 14, High Plains Southeast	Water-slight
				25 percent Rock River sandy loam	Fan aprons	60” or more		Sandy, 10 to 14, High Plains Southeast
								Water-slight
								Wind – severe

142	Diamond-ville Forelle association, rolling	5,300 to 7,500 ft	sandstone	50 percent Diamond-ville loam	hillslopes	20– 40”	Loamy, 10 to 14, High Plains Southeast	Water-moderate
			various	30 percent Forelle loam	Toe slopes and fan aprons	60” or more		Loamy, 10 to 14, High Plains Southeast
148	Forelle-Poposhia association, 2 to 12 percent slopes	5,300 to 7,500 ft	various	45 percent Forelle loam	fan aprons	60” or more	Loamy, 10 to 14, High Plains Southeast	Water-slight
				40 percent Poposhia loam	toe slopes and fan aprons	60 “ or more		Clayey, 10 to 14, High Plains Southeast
207	Sinkson-Almy sandy clay loams, 0 to 6 percent slopes	6,500 to 7,500 ft	Sandstone and siltstone	50 percent Sinkson sandy clay loam	Fan aprons	60 “ or more	Loamy, 10 to 14, Foothills and Basins East	Water-slight
			Sandstone inter-bedded with shale	30 percent Almy sandy clay loam	Fan aprons	60 “ or more		Loamy, 10 to 14, Foothills and Basins East
208	Sinkson-Almy-Thermopolis association, rolling	5,500 to 7,800 ft	Sandstone and siltstone	45 percent Sinkson loam	Fan aprons	60 “ or more	Loamy, 10 to 14, Foothills and Basins East	Water-moderate
			Sandstone inter-bedded with shale	20 percent Almy loam	Fan aprons	60 “ or more		Loamy, 10 to 14, Foothills and Basins East
			Sandstone or siltstone	20 percent Thermopolis loam	Hills and ridges	6 – 20”	Shallow Loamy, 10 to 14, Foothills and Basins East	Water-severe

APPENDIX C:

GRAZING ALLOTMENTS IN THE BRIDGER MOUNTAIN LANDSCAPE

Table C1: Allotment Characteristics

Allotment Number	Allotment Name	BLM Acres in BML*	# and Kind of Animals	Grazing Season	percent Public Land	Total Animal Unit Months	BLM Animal Unit Months	Management Category
01304	Crawford Creek	2342	300 Cattle 88 Cattle	6/15 to 9/20 6/15 to 10/14	35 35	966 354	338 124	I
01305	Lybyer North	490*	350 Cattle	4/26 to 5/31	64	414	265	I
01306	Canning	347	5 Horses 13 Cattle 13 Cattle	3/1 to 2/28 3/1 to 5/1 8/10 to 2/28	16 16 16	62 25 88	10 4 14	M
01307	Mallet-Smith Pasture	137	80 Cattle	7/1 to 9/30	10	240	24	C
01308	167A Scott-Robson	168*	320 Sheep 64 Cattle 320 Sheep 64 Cattle	5/1 to 6/15 5/1 to 6/15 10/15 to 12/17 10/15 to 12/17	7 7 7 7	100 100 100 100	7 7 7 7	M
01309	Logan Pasture	2,578*	413 Cattle	6/1 to 9/15	42	1452	610	M
01310	Cottonwood Pass	2,317	302 Cattle 302 Cattle	6/11 to 6/15 10/18 to 11/1	83 83	149 149	124 124	C
01318	Below the Hill	2,548	28 Cattle	6/1 to 9/29	70	111	78	M
01319	Twidale	18*	32 Cattle 32 Cattle 1 Horse	5/1 to 5/31 10/1 to 10/30 11/1 to 2/28	58 58 58	33 31 3	19 18 2	C
01323	Fuller Allotment	3,050	136 Cattle 136 Cattle	5/24 to 6/25 8/7 to 10/28	79 79	148 370	117 293	I
01324	Hoodoo Creek - Dry Creek Pasture only	2,438*	340 Cattle 340 Cattle	6/1 to 6/26 9/1 to 10/10	36 36	292 447	105 161	I
01326	Lichtenstein	1,342*	620 Sheep 235 Sheep 72 Cattle	12/1 to 2/28 3/1 to 4/15 1/1 to 2/28	86 86 86	367 71 140	316 61 120	I
01327	Myrtle Reed	1,213	41 Cattle	5/1 to 10/31	29	248	72	I

Allotment Number	Allotment Name	BLM Acres in BML*	# and Kind of Animals	Grazing Season	percent Public Land	Total Animal Unit Months	BLM Animal Unit Months	Management Category
01329	Lysite Mountain	8,194	329 Cattle 15 Horses	5/16 to 9/1 3/1 to 2/28	68 68	1514 180	1030 124	I
01331	Battle Axe Berger North Pasture East Pasture West Pasture	7,270*	34 Horses 64 Cattle 5 Horses 50 Cattle 30 Cattle 5 Horses 50 Cattle	3/1 to 2/28 3/1 to 2/28 3/1 to 2/28 12/1 to 1/1 10/1 to 2/28 1/1 to 3/15 1/1 to 4/30	45 45 70 70 70 57 57	408 318 27 53 149 12 196	184 143 19 37 104 7 112	M
01332	Bow & Arrow	584*	15 Horses 50 Horses 153 Cattle	6/1 to 9/30 4/10 to 6/15 10/1 to 12/1	33 33 33	61 109 312	20 36 103	M
01334	Cottonwood Pass	3,890	345 Cattle	6/11 to 10/20	55	1500	825	I
01337	DePass Ranch	528	10 Cattle	3/1 to 2/28	100	120	120	C
01340	168A North of Seeps	794	100 Cattle 10 Horses 23 Cattle	5/1 to 6/1 6/1 to 9/30 9/20 to 12/1	100 100 100	105 40 55	105 40 55	C
01341	168A Stock Driveway	699*	28 Cattle 10 Horses	12/1 to 12/31 12/1 to 12/31	100 100	29 10	29 10	M
01343	Tuff Creek	6,016*	260 Cattle 17 Cattle	4/1 to 7/31 11/16 to 7/31	78 78	1,042 59	813 46	C
01344	Westfall	3,620	104 Cattle 11 Horses 11 Horses 18 Cattle	6/1 to 12/20 3/1 to 7/31 8/1 to 12/20 8/1 to 2/28	71 22 100 100	200 55 51 125	142 12 51 125	I
01345	Mountain Pasture	1,135	72 Cattle	5/20 to 1/15	48	571	274	C
01346	Bonneville Reservoir	405*	156 Cattle 12 Horses 283 Cattle	4/15 to 6/10 4/15 to 6/10 10/1 to 12/31	84 84 84	293 23 856	246 19 719	I
01347	Jones Creek Basin	1,292	428 Cattle	7/1 to 10/10	34	1435	488	I

Allotment Number	Allotment Name	BLM Acres in BML*	# and Kind of Animals	Grazing Season	percent Public Land	Total Animal Unit Months	BLM Animal Unit Months	Management Category
01348	J. Herbst Summer	2,385	180 Cattle 12 Horses	6/1 to 9/30 10/1 to 4/30	38 38	721 84	274 32	M
01350	Wm Herbst Summer	699	95 Cattle	10/15 to 12/15	31	194	60	C
01352	Joe Johns Pasture	1,109	693 Sheep 29 Cattle	6/1 to 10/1 8/15 to 11/30	45 45	560 102	252 46	C
01353	Campbell	2,845*	13 Horses 46 Cattle 435 Sheep 510 Sheep	4/15 to 1/1 5/13 to 11/30 5/15 to 7/15 9/1 to 12/10	32 32 32 32	113 306 178 338	36 98 57 108	M
01354	Stinking Well	550*	759 Sheep 285 Sheep 44 Cattle	12/1 to 4/15 5/15 to 6/15 12/1 to 5/31	79 79 79	678 59 261	536 47 206	I
01355	Lookout Hill	568*	85 Cattle 1148 Sheep 1185 Sheep	4/1 to 6/28 11/20 to 12/10	71 71 71	125 672 163	89 477 116	M
01356	Howard Pasture	1,637*	35 Cattle 75 Sheep 415 Sheep	1/1 to 2/28 4/1 to 7/31 12/15 to 2/28	67 67 67	67 60 207	45 40 139	I
01357	Summer Allotment	182	32 Cattle	6/15 to 7/14	100	32	32	M
01358	Top of Mountain Pasture	910	51 Cattle	6/15 to 10/15	11	209	23	C
01359*	Ramage Ranch	2,645	308 Cattle 201 Cattle	11/1 to 5/15 5/1 to 6/20	62 62	1984 337	1230 209	I
01360	Ruth Fuller Private	89	100 Cattle 50 Cattle	5/15 to 5/23 6/26 to 8/6	9 9	33 66	3 6	C
01361	Copper Mountain	288	78 Cattle	7/1 to 9/30	17	235	40	C
01365	Quien Sabe Ranch Pasture West Pasture South of Mountain	5,741	 310 Cattle 352 Cattle 300 Cattle 545 Cattle	 4/1 to 5/10 5/11 to 6/10 6/1 to 6/30 10/1 to 11/15	 7 96 51 51	 414 358 296 824	 29 344 151 420	 I

Allotment Number	Allotment Name	BLM Acres in BML*	# and Kind of Animals	Grazing Season	percent Public Land	Total Animal Unit Months	BLM Animal Unit Months	Management Category
01366	Cabin Pasture	265	10 Horses 70 Sheep 14 Cattle	5/1 to 11/30 3/1 to 2/28 3/1 to 2/28	16 16 16	69 169 169	11 27 27	C
01367	Heinrich Pasture	81	33 Cattle	5/15 to 11/1	6	183	11	I
01373	Copper Mountain	277	180 Cattle	6/1 to 10/15	2	800	16	C
02520	Woods Basin	173	7 Cattle	6/20 to 9/30	100	24	24	C

*Only acres within the Bridger Mountain Landscape are included in this Assessment

Table C2: Factors used in Categorization of Category I Allotments*

Allotment Number	Allotment Name	1	2	3	4	5	6	7	8	9
01304*	Crawford Creek	x	x					x	x	x
01305*	Lybyer North	x				x		x	x	x
01323*	Fuller Allotment	x				x		x	x	x
01324*	Hoodoo Creek	x	x	x	x	x		x	x	x
01326*	Lichtenstein	x	x	x				x	x	x
01327*	Myrtle Reed	x	x			x	x	x	x	x
01329*	Lysite Mountain	x			x	x	x	x	x	x
01334*	Cottonwood Pass	x	x	x		x		x	x	x
01344*	Westfall	x			x			x	x	x
01347*	Jones Creek Basin	x						x	x	x

Allotment Number	Allotment Name	1	2	3	4	5	6	7	8	9
01354*	Stinking Well	x	x	x		x		x	x	x
01356*	Howard Pasture	x	x	x		x		x	x	x

*Factors used in Categorization of Category I Allotments are as follows:

1 – Ecological site inventory results indicate vegetative production is not satisfactory, key species are not present in satisfactory amounts, and species composition indicates less than satisfactory range condition.

2- Allotment evaluation indicates utilization, trend, and condition n of the vegetative resource is not satisfactory.

3- Allotment analysis shows significant forage competition between grazing animals and indicates sufficient forage is not available to support present levels of livestock and management objective levels of other grazing animals.

4 – The distribution of grazing animals is not satisfactory. Significant problems exist around wetlands, riparian areas, and meadows.

5- Turnout dates and season of use are not consistent with range readiness and sound range management principles.

6- Significant conflicts with other land uses are evident.

7 – Analysis of the allotment’s soil survey information indicates (as per SCS Range Site Guides) potential for high productivity in the various range sites.

8 – Analysis of the allotment’s vegetative composition information gathered during the ecological site inventory indicates that current vegetative productivity by range site is below the potential, as indicated by SCS Range Site Guides.

9 – There is a potential for positive economic return on public investment.

Management categories (I, M, or C) indicate whether an allotment has one or more significant problems or whether federal investment for improvements is feasible. I, or Improve category allotments are allotments that have one or more significant resource problems, M, or Maintain category allotments have no significant resource problems, and C, or Custodial Allotments are characterized by the fact that federal investment is not feasible because of lack of potential for return on public investment. The categories are used to prioritize monitoring and standards assessments among the 291 administered by the Lander Field Office. In the case of assessing standards on a large

landscape scale, all allotments within the designated landscape are assessed regardless of category. Table B2 in Appendix B shows the factors used in categorization of all category I allotments in the BML. Typically, the allotments with the most boxes checked will be the areas needing the most attention. However, categories were last assigned in 1987, so it is reasonable to assume that some of these factors may have changed.

TABLE C3: Standards Conformance Reviews Prior to creation of BMGMA

Allotment Number	Allotment Name	Standard 1	Standard 2	Standard 3	Standard 4	Standard 5	Standard 6	
01359	Ramage Ranch	Yes	N/A	Yes	No	Yes	Yes	
01324	Hoodoo Creek	No	Yes	No	No	Unknown	Yes	
01373	Copper Mountain	Yes	N/A	Yes	Yes	Unknown	Yes	
01307	Mallet-Smith	Yes	N/A	Yes	Yes	Unknown	Yes	
01358	Top of Mountain	Yes	N/A	Yes	Yes	Unknown	Yes	
01327	Myrtle Reed	Yes	Yes	Yes	Yes	Unknown	Yes	
01337	De Pass Ranch	Yes	Yes	Yes	Yes	Unknown	Yes	
01329	Lysite Mountain	Yes	Yes	Yes	Yes	Yes	Yes	
01334	Cottonwood Pass	Yes	N/A	Yes	Yes	Yes	Yes	
01341	168 A Stock Driveway	Yes	Yes	Yes	Yes	Unknown	Yes	

APPENDIX D:

BROWSE TRANSECTS

TABLE D:1 Browse Transect Data

Allotment	Transect	Shrub Species	Wildlife Habitat	Pellets	percent Lightly Utilized	percent Moderately to Heavily Utilized	Age Diversity
Mountain Pasture # 01345	01345-T1	Wyoming Big Sage, Threetip Sage		Elk, Pronghorn, Cattle	100	0	Yes
J. Herbst Summer	01348-T2	Black Sage, Mountain Sage	Mule Deer CWR	Mule Deer, Pronghorn, Cattle	19	81	Some
	01331-T3	Wyoming Big Sage, Threetip Sage	Pronghorn CWR, Mule Deer CWR	Mule Deer	100	0	No
	01331-T4	Wyoming Big Sage,	Pronghorn CWR, Mule Deer CWR	Mule Deer, Pronghorn	44	56	Yes
Top of Mountain	01358-T1	Wyoming Big Sage, Threetip Sage, Rubber Rabbit Brush, Fringe Sage, Skunkbush Sumac	Mule Deer CWR	Mule Deer, Elk, Pronghorn, Cattle	57	43	Some
Joe John's Pasture	01352-T1	Wyoming Big Sage, Threetip Sage, Black Sage	Sage Grouse Core	Pronghorn, Cattle	53	47	No
Myrtle Reed	01327-T1	Wyoming Big Sage,	Mule Deer CWR	Mule Deer, Elk	89	11	No
Battle Axe Berger	01331-T2	Wyoming Big Sage, Winterfat	Pronghorn CWR, Mule Deer CWR	Mule Deer, Pronghorn, Sagegrouse	50	50	Some
	01331-T3	Wyoming Big Sage, Threetip Sage	Pronghorn CWR, Mule Deer CWR	Mule Deer	100	0	No
	01331-T4	Wyoming Big Sage,	Pronghorn CWR, Mule Deer CWR	Mule Deer, Pronghorn	44	56	Yes
Fuller Allotment	01323-T1	Wyoming Big Sage	Sage Grouse Core	Pronghorn, Sage-grouse, Cattle	0	100	No
	01323-T2	Wyoming Big Sage, Black Sage, Rubber Rabbit Brush,	Mule Deer CWR, Sage Grouse Core	Pronghorn, Sage-grouse, Cattle	6	94	No
	01323-T3	Wyoming Big Sage	Mule Deer CWR, Sage Grouse Core	Cattle, Mule Deer	100	0	Some
Summer Allotment	01357-T1	Wyoming Big Sage, Threetip Sage	Sage Grouse Core		100	0	Yes
Campbell	01353-T1	Wyoming Big Sage,	Sage Grouse Core		100	0	Yes

		Black Sage, Threetip Sage					
	01353-T2	Wyoming Big Sage, Threetip Sage	Sage Grouse Core		100	0	No
Lysite Mountain	01329-T2	Wyoming Big Sage, Black Sage,	Mule Deer CWR, Sage Grouse Core	Mule Deer, Elk, Cattle	100	0	Some
Henrich Pasture	01367-T1	Wyoming Big Sage, Threetip Sage	Elk CWR, Sage Grouse Core	Mule Deer, Pronghorn, Sage-grouse, Cattle	41	59	No
Cotton- wood Pass 01334	01334-T1	Wyoming Big Sage, Black Sage, Rubber Rabbit Brush	Elk CWR, Sage Grouse Core	Pronghorn, Sage-grouse, Cattle	47	53	No
	01334-T2	Wyoming Big Sage, Black Sage, Threetip Sage	Elk CWR, Sage Grouse Core	Pronghorn, Cattle	28	72	No
Cotton- wood Pass 01310	01310-T1	Wyoming Big Sage, Winterfat, Threetip Sage	Mule Deer CWR	Pronghorn, Cattle	16	84	No
Logan Pasture	01309-T1	Wyoming Big Sage, Black Sage	Mule Deer CWR	Cattle	100	0	Some
167A Scott Robson	01308-T1	Wyoming Big Sage	Mule Deer CWR	Mule Deer, Pronghorn, Cattle	4	96	No
168 A Stock Driveway	01341-T1	Wyoming Big Sage, Winterfat, Rubber Rabbit Brush	Mule Deer CWR	Mule Deer, Pronghorn, Cattle	22	78	No

APPENDIX E:

GLOSSARY

Most of the following definitions are taken from *A Glossary of Terms Used in Range Management* published by the Society for Range Management. Also, USDA – NRCS *Rangeland Soil Quality Information Sheet* definitions were used. Other definitions are taken from the Grazing Administration Code of Federal Regulations, Chapter 43, Section 4100.0-5 or Bureau of Land Management manuals and technical references, and from USDA – SCS *Soil Survey of Fremont county, East Part and Dubois Area, Wyoming 1983*

Alluvium: Material, such as sand, silt or clay, deposited on land by streams.

Animal Unit Month (AUM): The amount of forage required by an animal for one month of grazing.

Badlands: Steep or very steep, commonly non-stony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material.

Association, soil: A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Complex, soil: A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of soils or miscellaneous areas are somewhat similar in all areas.

Ground cover: The percentage of material, other than bare ground, covering the land surface. It may include live and standing dead vegetation, litter, gravel, cobble, stones, boulders, and bedrock. Ground cover plus bare ground would total one-hundred percent.

Litter (organic): The fallen leaves, stems, bark, flowers, and seeds of trees, shrubs, forbs, and grasses; detached lichen; animal feces and dead insects and other animals; and unidentifiable amorphous woody organic matter (humic litter) lying on the mineral soil surface.

Mesic: Growing in conditions of medium water supply.

Noxious weed: A weed arbitrarily defined by law as being especially undesirable, troublesome, and difficult to control. In Wyoming the following plants are defined as *Noxious Weeds* according to the Wyoming Weed and Pest Control Act of 1973 [§§§§ 35-7-372]: *Field bindweed, Canada thistle, Leafy spurge, Perennial sow thistle, Quack grass, Hoary cress, Perennial pepperweed, Ox-eye daisy, Skeletonleaf bursage, Russian knapweed, Yellow toadflax, Dalmatian toadflax, Scotch thistle, Musk thistle, Common burdock, Plumeless thistle, Dyers woad, Houndstongue, Spotted knapweed, Diffuse knapweed, Purple loosestrife, Tamarisk (salt cedar), Common St. Johnswort, and Common tansy.*

Proper Functioning Condition (PFC): This refers both to a *method* for assessing riparian zones / wetlands and *functionality rating*.

In performing the PFC *method* of assessment each riparian zone / wetland is judged against its *capability* and *potential* as characterized by three components: hydrology, vegetation, and erosion/deposition (soils). Here the term *potential* refers to: *The highest ecological status a riparian –wetland area can attain.... Also, referred to as the” potential natural community”*. The term *capability* refers to: *The highest ecological status an area can attain given political, social, or economic constraints which are often referred to as limiting factors*.

As a *functionality rating* riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bed load, and aid floodplain development; improve flood-water retention and ground-water recharge; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support biodiversity.

Residuum (residual soil material): Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock weathered in place.

Rangeland health: Rangeland health is the degree to which the integrity of the soil, the vegetation, the water, and the air as well as the ecological processes of the rangeland ecosystem are balanced and sustained.

Slope alluvium: Sediment transported on hill or mountain slopes and deposited on the lower parts of those slopes.

Vegetative cover: The percent ground cover provided by all live vegetation (basal cover of grasses plus foliar cover of forbs and shrubs).

APPENDIX F:

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