

APPENDIX 1  
UPPER WIND RIVER, DUBOIS WY AREA  
STANDARDS AND GUIDELINES ASSESSMENT

Lander Field Office



## **Executive Summary**

This document is a Wyoming Standards of Rangeland Health evaluation for the Upper Wind River or Dubois Management Area. This area all lies within the Lander Field Office, Wind River/ Bighorn Basin District, Bureau of Land Management (BLM). Resource conditions are described for 27,195 acres of public land. The evaluation pertains to 23 BLM grazing allotments and is based on an interdisciplinary team (ID) field assessment conducted during the summer of 2011.

Field data gathered support the following observations about the Upper Wind River, Dubois Area:

- Native uplands support healthy, diverse plant communities that allow for rangeland processes to function properly. Evidence of accelerated soil erosion is absent in upland areas.
- Riparian areas and wetland areas with perennial water sources are in Proper Functioning Condition. Key vegetation components necessary to support proper functioning riparian systems are present.
- Grizzly bear, gray wolf and Canada lynx are federally listed species known to occupy the analysis area however the area is outside designated Critical Habitat for Canada lynx. There is no suitable habitat for black-footed ferret, Desert yellowhead, Ute Ladies'-tresses or blowout penstemon and the area does not fall within the Platte River watershed.
- The Upper Wind River, Dubois Area currently supports few noxious and invasive upland plant species. There are some isolated spots with whitetop and Cheatgrass, however they are present in minor quantities and in only one or two allotments. This would not cause those allotments to fail Standards for Rangeland Health, attention to controlling and containing the spread of these plants will be an important part of maintaining rangeland health into the future.

## **Background**

### **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 or 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 watersheds, 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.

Standards assessments 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 moving forward, beginning in 2009, the Manual Transmittal Sheet Release 4-110 dated 1/6/2009 states that "Evaluation of land health Lander Field Office has adopted an approach of delineating Geographic Management Areas that are similar biologically and ecologically. The arrangement of watersheds on the landscape are still a major consideration when delineating the Management Areas, however, factors such as ecological sites, annual precipitation, wildlife habitat, vegetation and soils are also considered. The difference in grazing management seasons between geographic areas is also a factor. Seasons which inform grazing management such as early green-up, critical growing seasons, and late or dormant seasons will vary depending on variables such as elevation and aspect.

## **Public Involvement**

Scoping and Public involvement for Standards Assessments in the Upper Wind River, Dubois area have been both formal and informal. For several of the assessments that were completed or begun between 1998 and 2008, formal letters were sent to the grazing permittees, agencies and interested publics informing them of the data collection process and inviting them to participate if they wished. For data collection in 2011, leasee's were contacted by telephone to inform them when BLM would be out on their allotments. When leasee's expressed the desire to participate or observe, data collection schedules were modified to accommodate them. Interested members of the public have been informally included in the process from its inception and have been formally invited to comment or express concerns in letters dated February 2, 2011.

## **Wyoming Rangeland Health Standards**

The standards are the basis for assessing and monitoring rangeland conditions and trend. 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 - Watershed:** Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.

The standard is considered met if upland soil bare ground is appropriate for the ecological site and/or obvious signs of soil erosion are not apparent, and stream channels are stable and improving morphologically.

**Standard 2 – Riparian/Wetland :** 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 if riparian/wetland habitat is rated in Proper Functioning Condition (PFC) or Functioning at Risk with an upward trend and existing management will lead to maintaining or improving resource conditions.

**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.

The standard is considered met if plant communities are sustaining themselves under existing conditions and management. Plant species are also appropriate for the ecological sites on which they are found.

**Standard 4 – Animal and Plant Populations and Habitats; Weeds:** Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats

that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.

The standard is considered met if habitat needed to support wildlife species is being sustained under existing conditions and management.

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

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

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

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

### **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 developed so the standard may be attained. An Environmental Analysis which will examine grazing management in the block 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 progress is being made toward attainment of the standard(s).

### **Assessment Criteria**

BLM used a variety of information sources and the professional judgment of resource 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**

Lander Field Office ID Team members assessed upland and riparian health based on predominant conditions observed within primary ecological sites. Upland areas isolated in size or occurrence that were not meeting standards, such as those typically found immediately around livestock watering facilities, were not considered to be indicative of overall range health status for the pasture. Instead, range health assessments and associated vegetation transects were based on areas at reasonable distances from livestock water in order to avoid localized heavy-use or ungrazed areas that do not accurately reflect the overall impacts of grazing. Assessment determinations were made after observing as much of the area as possible by vehicle or on foot.

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 upland transects in representative areas within grazing allotments. The transect data and locations can be found in the individual allotment files at the Lander Field Office. Transect data is portrayed in the following analysis of the standards.

## **Assessment Methods for Upland Sites**

### *Existing Survey Data and Reference Areas*

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 during the 1980's (The 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. The Fremont County Soil Survey was also used to help interpret observed conditions. 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 two BLM approved methods: step-point transects, and ocular estimates ("Sampling Vegetation Attributes", USDI, BLM Tech. Ref. 1734-4, 1996. Due to time constraints, the ID team chose to sample rangeland with 68 point step-point transects and ocular estimates. Ocular estimates were made on the basis of experience gained from conducting step-point transects. In other words, actual detailed measurements were used as the method of "calibration" for 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 noted vegetation attributes that affect wildlife security and production. These attributes included the age and condition of sagebrush and other browse species. In addition, about 180 digital images of upland habitat were taken, many at previously identified Photo Points. Changes or lack of change visible from these photos will help determine trend and other vegetation attributes. Finally, professional judgment is used to draw conclusions about land health when there are 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 Trend for Proper Functioning Condition (PFC) Assessments**

Riparian trend is determined by comparing the present situation with previous photos, trend 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. When 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. Assessments of upland rangelands for Rangeland Health Standards 1 and 3, and riparian area assessments for Standard 2, have direct relevance to evaluation of Standard 4 (Water Quality). For streams that lack specific water quality data, it is unknown if the standard is met.

## Climate

Climate for the analysis area is considered semi-arid with 10 to 20 inches of precipitation depending on elevation. Snow distribution at lower elevations is influenced by wind with drifts forming behind taller plants and topographic features. Precipitation occurs in the form of both snow and rain, with June the wettest month for higher elevations and May the wettest month in the lower elevations.

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 frequently between April and October. Storms that occur July through August are typically drier with more lightning strikes than those in September or October.

This area is also characterized by periodic drought, the latest lasting from 2000 to 2006.

Generally, the last spring frost occurs in late May and first frost by mid- September.

The frost-free period (temperatures above 32° 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. Prevailing winds are west-southwest, with the most intense winds occurring during March and April. December and January are usually the calmest months.

## Topography

Topography of the Upper Wind River, Dubois area is largely characterized by steep and rugged terrain intersected by the Wind River and several side drainages with narrow stream-cut valleys. Elevation ranges from 6,946 feet at Dubois, Wyoming to almost 9,000 feet near the Ramshorn Peak. Most of the higher peaks across the landscape block are from 7,000 to 9,000 feet, and the lower valley floors are around 7,000 feet and below. The lower-elevation lands, streams, highly productive flood plains, and some gentler north and south 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.

## Soils and Ecological Sites

The Upper Wind River, Dubois area consists of a variety of soil mapping units from the Soil Survey of Fremont County, East Part and Dubois Area, Wyoming. Most often the mapping units will be of two or more soil types, forming complexes or associations. A table of soil mapping units and their characteristics is found at the end of this section.

Modern, reconnaissance-level soil surveys cover all of the Upper Wind River, Dubois area. These soil surveys are: the 1993 USDA-Soil Conservation Service Cooperative Soil Survey of Fremont County, East Part and Dubois Area, Wyoming.

Based on soil mapping units the ecological sites present in the area are predominately Shallow Loamy 10-14"precipitation, High Plains Southeast, Shallow Loamy 10 -14" precipitation, Foothills and Basins East, and Shallow Loamy 15-20" precipitation, Foothills and Mountains East.

Soil Mapping Unit	Soil name	Soil Depth	Predominant Surface Texture	Water Erosion Severity	Wind Erosion Severity
111	Badland	12" over bedrock	Sandy Clay Loam, Clay Loam	Severe	Severe

125	Brownsto very bouldery-Decross Variant-/Brownsto complex, hilly	60" +	Very Bouldery Sandy Clay Loam	Moderate	Slight
135	Crago-Pensore complex	Crago-60" + Pensore 13" Over hard limestone bedrock	Crago-60" + Pensore 13" Over hard limestone bedrock	Slight to Moderate	Moderate to Slight
173	Midelight Variant-Winada Variant-Starman gravelly loams, Steep	20 - 40" over sandstone bedrock	Gravelly Loam	Severe	Slight
180	Pensore-Rock outcrop complex	11" Over hard limestone bedrock	Loam	Severe	Slight
193	Rockinchair-Rock Outcrop-Sinkson Complex, Hilly	32" over soft shale bedrock	Sandy Loam, Loam	Severe	Severe
208	Sinkson-Almy-Thermopolis association, rolling	60 + inches	Loam	Moderate	Moderate
211	Thermopolis-Sinkson association, Hilly	60 + inches	Fine Sandy Loam	Severe	Moderate
19	Countyman-Tisworth-Iceslew-Absher	60+ inches	Surface layer is loamy	Moderate	Moderate

## Vegetation

Vegetation is predominantly sagebrush-grass intermixed with scattered mixed 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 next principle types found in this area. Basin big sagebrush occurs in low elevations in association with certain major drainages. Mountain shrubs, including bitterbrush, snowberry, serviceberry, chokecherry, occur in the area and are usually confined to snow catchment areas or draws in the higher elevations.

Perennial grasses that occur on the uplands include bluebunch wheatgrass, mutton bluegrass, Idaho fescue, Sandberg bluegrass, western 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.

Riparian and wetland habitats occur on a very small percentage of these public lands. The typical riparian area on public land is a portion of a perennial creek and the associated riparian zone along the creek. Nebraska sedge or water sedge can be found on these areas, along with tufted hair grass. Drier sites may have Baltic rush, Kentucky bluegrass or red top. Basin wild rye is a common occurrence along

some drainages. Tree-dominated habitat such as cottonwood, aspen or willow occurs in strips, along perennial or ephemeral streams mostly on private land.

### Allotments and Grazing

There are 23 allotments permitted for grazing use on public lands in the analysis area. Grazing use is primarily cattle and horses. No allotments are authorized for sheep grazing due to the proximity of bighorn sheep in the Whiskey Basin Bighorn sheep winter range, the Dubois Badlands, and in the East Fork area and the disease transmission concerns associated with wild and domestic populations of sheep. Historical use in this area is a mix of livestock with use documented as early as the late 1800's. The Taylor Grazing Act in 1934 began a process of establishing range use, creating allotments and developing range improvements. Fencing of allotments has been an ongoing, long-term process. Pasture fencing has occurred primarily based on geographic ease of building with little regard to land ownership patterns. The table lists the allotment name, number, BLM public land acres, number and kind of animal permitted, grazing season, and AUMs available on BLM public land and the management category.

Allotment Name	Allotment Number	Livestock Numbers	Livestock Kind	Begin Date	End Date	Public Acres	Permitted AUMS	Management Stat Cd
LIME KILN GULCH	2103	99	CATTLE	5/15	6/30	1150	154	C
LITTLE WARM SP. CNYN	2104	238	CATTLE	9/25	9/27	320	27	M
		136	CATTLE	9/28	9/28			
FIRE RIDGE	2106	2	HORSE	6/15	9/30	154	8	M
WELLS 11	2107	6	HORSE	5/1	6/30	308	31	M
		6	HORSE	8/1	10/31			
GEYSER CREEK	2108	12	HORSE	6/1	9/30	829	50	M
CROSS 14	2109	33	CATTLE	6/1	9/30	669	134	C
LITTLE HORSE CREEK	2110	12	HORSE	5/15	10/31	700	51	I
E A MOUNTAIN 16	2111	86	CATTLE	6/1	6/30	1874	291	M
		44	CATTLE	8/1	9/30			
		117	CATTLE	10/1	10/30			
CROOKED CREEK	2113	140	CATTLE	6/25	9/30	1156	133	C
		60	HORSE	6/25	10/28			
HAT BUTTE	2115	52	CATTLE	6/1	6/30	1000	154	C
		52	CATTLE	9/1	10/30			
ELK RIDGE SOUTHEAST	2116	7	HORSE	6/1	8/31	320	21	C
BLUE HOLES	2117	15	HORSE	3/1	4/30	673	90	C
		15	HORSE	11/1	2/28			
WHITE PASS 31	2119	29	CATTLE	5/1	6/30	637	116	C
		29	CATTLE	10/1	11/30			
WINDY RIDGE	2120	13	CATTLE	4/1	6/30	320	54	C
		14	CATTLE	10/1	10/31			
MASON DRAW	2121	214	CATTLE	5/1	5/30	6720	816	I
		214	CATTLE	6/1	6/30			

		398	CATTLE	10/1	10/30			
TAPPAN CREEK 34	2122	121	CATTLE	6/1	11/15	1081	180	I
BATTRUM MOUNTAIN	2123	118	CATTLE	6/1	10/15	5937	531	C
ALBRIGHT 47	2125	7	HORSE	4/1	6/30	280	28	C
		7	HORSE	10/1	10/31			
CM 49	2126	29	HORSE	6/1	6/30	996	57	M
		28	HORSE	11/10	12/9			
WAGON GULCH	2127	2	CATTLE	6/15	12/15	680	95	C
		13	HORSE	6/15	12/15			
BITTERROOT 60	2128	71	HORSE	5/20	6/17	682	68	C
CROSS 67	2130	18	CATTLE	5/1	9/30	589	91	C
STONE POINT 73	2132	1	HORSE	3/1	6/1	120	12	I
		2	HORSE	10/15	2/28			

### Water Resources and Riparian/Wetland Areas

Riparian zones 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 Upper Wind River, Dubois area 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.

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. 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.

The majority of creeks and water courses and their associated riparian areas within the Upper Wind River, Dubois area are on 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, usually tied to springs or snowmelt, these areas may support riparian habitat. As water becomes more limiting they do not support wetland vegetation. The numerous creeks that originate in the mountains are diverse and support grassland, shrubland and woodland riparian plant communities. In most cases, the highest elevation streams consist of high

gradient, highly armored type systems originating higher in the mountains from springs or snowmelt, fed from additional seeps and springs along their routes.

Riparian grassland habitat types are the most common form of vegetation, but there are also several willow riparian shrublands, and cottonwood woodlands. Riparian grasslands are wetland, stream, or spring-associated grass and grass-like communities, which are maintained by water tables within rooting depth during most of the growing season. Common species include Nebraska and beaked sedges, Baltic rush, spike-sedge, tufted hairgrass, basin wildrye, wheatgrass, saltgrass, Kentucky bluegrass, redtop, mat muhly, alkali sacaton, cinquefoil, horsetail, plantain, mint, aster and thistle. Willow riparian shrublands occur as scattered individuals or as denser communities, on wet sites that are somewhat thermally protected along drainages.

#### Evaluation Method:

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 is not desired or future condition (TR 1737-15 1998). PFC assessments have been conducted in the area since the late 1990s, with the most recent assessments occurring during the summer of 2011. In addition to PFC, photo-points have been used to document riparian condition. The following is the Standards and Guidelines Conformance Review for the Upper Wind River, Dubois area allotments:

### Wyoming Rangeland Standards and Guidelines Conformance Review Summary

#### 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.**

#### **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.

**RESOURCE CONDITIONS IN THE ALLOTMENT MEET THE STANDARD? YES**

Rationale:

Members of a BLM Interdisciplinary Team (IDT) visited the grazing allotments during 2011 and completed 33 *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. For summaries of the results of this process see Table 1, Upland Qualitative Assessment Summary. Table 1 outlines the findings at all 33 sites throughout the Upper Wind River Dubois, Wyoming area 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 meet the standard. Sites that were found to be in a moderate departure from expected conditions are subject to professional judgment depending on the factors influencing the departure.

**Table 1. Upland Qualitative Assessment Summary**

Watershed	Ecological Site	Allotment Name and Number	Plant Association	Degree of Departure from Expected	
				Soil Site Stability	Hydrologic Function
Upper Wind River	Loamy 10 – 14 E	Lime Kiln Gulch #2103	Bluebunch wheatgrass/ Mixed Grass/Mixed shrub	None to Slight	None to Slight
		Little Warm Springs Canyon #2104,		None to Slight	Slight to Moderate
		Little Horse Creek #2110		Slight to Moderate	Slight to Moderate
		Mason Draw #2121		None to Slight	None to Slight
		Batrum Mountain #2123		T-1 None to Slight T-2 None to Slight	T-1 None to Slight T-2 Slight to Moderate
		Albright 47 #2125		None to Slight	None to Slight
		Wagon Gulch #2127		None to Slight	None to Slight
		Bitterroot 60 #2128	Slight to Moderate	Slight to Moderate	
Upper Wind River	Shallow Loamy 10-14 E	Geyser Creek #2108	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight	None to Slight

		Cross 14 #2109 Blue Holes #2117 Windy Ridge #2120 Tappan Creek #2122		None to Slight None to Slight None to Slight None to Slight	Slight to Moderate None to Slight Slight to Moderate Slight to Moderate T-2 None to Slight
	Coarse Upland 10-14 SE	EA Mountain #2111 Blue Holes #2117 Mason Draw #2121 CM 49 #2126 Stoney Point #2132	Bluebunch Wheatgrass/ mixed shrub	None to Slight None to Slight None to Slight None to Slight None to Slight	None to Slight None to Slight None to Slight None to Slight None to Slight
	Coarse Upland 15-19 E	Fire Ridge #2106, Wells 11 #2107 Geyser Creek #2108 Cross 14 #2109 Elk Ridge Southeast #2116 White Pass #2119	Mixed Grass/ Bluebunch/Mixed Shrub Bluebunch Wheatgrass/ Mixed Shrub	None to Slight None to Slight None to Slight None to Slight None to Slight	None to Slight Slight to Moderate None to Slight None to Slight None to Slight
Upper Wind River	Shallow Loamy 15-19 E	EA Mountain#2111	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight	None to Slight
		Crooked Creek #2113	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight	None to Slight
		Hat Butte #2115	Mixed Grass/Mixed Shrub/Forest	None to Slight	None to Slight
	Gravelly 15-19E	CM 49 #2126	Bluebunch Wheatgrass/mixed grass/ mixed shrub	Slight to Moderate	None to Slight
	Loamy 15-19 E	Cross 67 #2130	Bluebunch wheatgrass/ Mixed	None to Slight	None to Slight

			Grass/Mixed shrub		
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As table 1 illustrates, the majority of the uplands in the Upper Wind River, Dubois area allotments are functioning properly and meeting Standard #2 for Rangeland Health. As part of the supporting data for completing the matrices for the 17 Indicators for Rangeland Health, 68 Step Point Transects were conducted in 2011 in the Upper Wind River, Dubois Area. Step Point Transects measure bare ground, litter, gravel, stone, vegetative canopy cover, and basal cover. Table 2 organizes ground cover data from the step-point transects.

**TABLE 2: GROUND COVER DATA for Loamy 10-14 E**

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
2110 T-1	35	20-30	20	15-25	2	1	46	66
2110 T-1	28	20-30	29	15-25	0	0	43	72
2121 T-1	32	20-30	33	15-25	1	0	34	68
2121 T-1	32	20-30	30	15-25	4	0	35	69
2121 T-1	15	20-30	21	15-25	9	0	60	86
2121 T-2	45	20-30	12	15-25	1	0	43	56
2121 T-2	36	20-30	18	15-25	4	0	47	66
2121 T-2	41	20-30	12	15-25	2	0	49	60
2123 T-1	23	20-30	34	15-25	3	1	39	77
2123 T-1	17	20-30	23	15-25	9	0	51	83
2123 T-2	32	20-30	30	15-25	0	0	43	70
2123 T-2	42	20-30	11	15-25	0	0	47	58
2125 T-1	20	20-30	19	15-25	4	0	58	80
2125 T-1	20	20-30	29	15-25	7	0	56	90
2127 T-1	33	20-30	20	15-25	0	0	50	68
2127 T-1	14	20-30	15	15-25	3	0	68	86
2128 T-1	36	20-30	11	15-25	7	2	44	64
2128 T-1	51	20-30	20	15-25	10	1	19	50

**TABLE 2: GROUND COVER DATA for Loamy 15-19 E**

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
2130 T-1	18	0-20	15	5-40	8	0	61	83
2130 T-1	10	0-20	9	5-40	4	0	77	90

**TABLE 2: GROUND COVER DATA for Shallow Loamy 10-14 E**

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
2104 T-1	14	15-45	18	10-25	4	7	58	86
2104 T-1	10	15-45	19	10-25	15	0	51	90
2108 T-1	10	15-45	14	10-25	12	3	61	90
2108 T-1	4	15-45	10	10-25	20	4	62	96
2109 T-1	16	15-45	10	10-25	16	6	52	84
2109 T-1	12	15-45	8	10-25	12	0	68	88
2117 T-1	8	15-45	18	10-25	19	5	50	92
2117 T-1	7	15-45	18	10-25	17	4	54	93
2120 T-1	16	15-45	11	10-25	26	5	43	84
2122 T-1	19	15-45	18	10-25	7	1	62	83
2122 T-1	18	15-45	14	10-25	8	0	62	82
2122 T-2	22	15-45	30	10-25	2	0	45	78

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

**TABLE 2: GROUND COVER DATA for Shallow Loamy 15-19 E**

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
2111 T-2	23	0-30	11	15-20	12	1	57	78
2113 T-1	6	0-30	19	15-20	10	0	65	94
2113 T-1	8	0-30	26	15-20	4	0	72	93
2113 T-1	11	0-30	9	15-20	7	0	87	90
2115 T-1	0	0-30	49	15-20	0	0	51	100
2115 T-1	0	0-30	34	15-20	0	0	67	100

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

**TABLE 2: GROUND COVER DATA for Gravelly 10-14 SE**

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
2126 T-1	16	10-15	13	10-15	17	4	53	84
2126 T-1	8	10-15	20	10-15	21	0	51	92

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

**TABLE 2: GROUND COVER DATA for Coarse Upland 10-14 E**

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
2103 T-1	18	10-30	29	5-30	8	0	45	82
2103 T-1	18	10-30	24	5-30	8	0	48	82
2111 T-1	9	10-30	19	5-30	6	3	63	91
2111 T-1	10	10-30	19	5-30	5	4	62	90
2117 T-2	8	10-30	22	5-30	7	12	54	92
2117 T-2	3	10-30	21	5-30	4	11	62	97
2126 T-2	19	10-30	17	5-30	6	14	44	81
2126 T-2	11	10-30	18	5-30	8	5	58	89
2132 T-1	14	10-30	21	5-30	4	11	53	86
2132 T-1	33	10-30	21	5-30	7	11	30	68
2132 T-1	13	10-30	23	5-30	6	14	45	88

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

**TABLE 2: GROUND COVER DATA for Coarse Upland 15-19 E**

Transect	Bare Ground	Expected Bare Ground	Litter	Expected Litter	Gravel	Stone	Vegetation	Ground Cover
2106 T-1	6	0-20	28	5-40	1	3	62	94
2106 T-1	3	0-20	47	5-40	0	1	49	97
2107 T-1	13	0-20	24	5-40	1	0	65	87
2107 T-1	21	0-20	32	5-40	0	0	53	85
2107 T-1	8	0-20	32	5-40	1	0	59	92
2108 T-3	14	0-20	27	5-40	30	17	125	92
2108 T-3	14	0-20	27	5-40	19	3	37	86
2109 T-4	7	0-20	24	5-40	1	0	69	93

2116 T-1	16	0-20	14	5-40	5	5	70	86
2116 T-1	13	0-20	19	5-40	9	4	55	87
2119 T-1	13	0-20	16	5-40	5	2	64	87
2119 T-2	3	0-20	17	5-40	0	3	77	97
2119 T-3	18	0-20	19	5-40	0	0	63	82
2119 T-3	5	0-20	16	5-40	2	0	78	95
2121 T-3	12	0-20	12	5-40	5	18	53	88
2121 T-3	29	0-20	26	5-40	9	3	33	71
2121 T-3	19	0-20	17	5-40	10	12	42	81

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

NRCS Ecological Site Guides give expected cover values for each site. Data collected indicates that most transect locations meet or exceed the cover requirements. All transects are within acceptable ranges of bare ground and litter expected for the ecological site or are within the margin of error based on the size of the data sets and the step-point method.

Water infiltrates into soils to be stored as plant available moisture to produce characteristic vegetation. The robust root systems of the cool season bunchgrasses that dominate these soils have been shown to be the most beneficial type of cover for maintaining soil infiltration rates that keep erosion to tolerable levels.

The hazard of water erosion is greatest in those uplands immediately adjacent to the streams and springs. According to the National Range and Pasture Handbook (NRPH) of November, 2001: "On pasturelands, several researchers found that 70 to 75 percent ground cover is a critical threshold with regard to runoff – cover exceeding 70 percent is slight. Runoff accelerates rapidly below 70 percent cover." (NRPH 7.1-16)

The relationship of hydrologic cover is inversely related to runoff potential in that high hydrologic cover would indicate low runoff potential (Van Haveren, 2000). From numerous studies from around the western United States it is known that hydrologic cover must be at least 70 percent to reduce runoff from rainfall and to protect soils from erosion (Van Haveren, 2001).

Ground cover for the sixty eight (68) 2011 transects averaged 83 percent ranging from 50 to 100 percent. This is well above the 70 percent needed to reduce runoff from rainfall and protect soils from erosion.

In the above mentioned Van Haveren publication from 2000 the largest component of hydrologic cover was litter, averaging 82 percent. For the Allotments in the Upper Wind River, Dubois area 2011 litter constituted 20 percent of the hydrologic cover which was well within what was expected for the sites.

Litter is important to rangeland soil health as it is necessary for the physical protection of the soil surface from erosion. The breakdown of litter, dead plant roots and soil microorganisms by the soil biota produces organic matter. This organic matter is important as it provides exchange sites to hold soil nutrients for plant use. It also promotes good soil structure by encouraging soil particle aggregation. This increases soil porosity, promotes water infiltration, increases available soil water holding capacity, decreases soil crusting, and makes soils less prone to compaction. A soil in good physical condition is more productive. Finally, soil organic matter acts as a buffer against rapid changes in acidity, sodicity, and salinity. (USDA – NRCS Soil Quality Information Sheet – Rangeland Sheet 6, 2001.)

Adequate cover from both vegetation and litter, is indicative of site stability (Packer, 1951). According to transect data bare ground averaged 23 percent, ranging from 0 to 43 percent, and a strong inverse relationship exists between this bare ground and hydrologic cover (see Figure 1). Soils are stable, ground cover is adequate, therefore the standard is met.

## **STANDARD # 2**

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.

### **Resource conditions in the allotment meet the standard? YES**

Rationale: The riparian areas in the Upper Wind River Dubois area allotment are tributaries of the Wind River. It was determined by the S&G interdisciplinary team that the small sections of riparian areas on the BLM were in proper functioning condition (PFC). The riparian/wetland vegetation has diversity in species and age class providing protection in case flood or bank full. There was large coarse and woody material on all reaches and/or woody vegetation capable of withstanding large flood events.

Members of BLM interdisciplinary Teams (IDTs) visited riparian areas throughout the Upper Wind River, Dubois area to assess Proper Functioning Condition (PFC). Some work was begun in 1998 and the PFC was reassessed in 2011 for changes in condition and trend

Proper Functioning Condition (PFC) assesses condition of riparian function, which is a result of interactions between geology, soil, water, and vegetation (USDI, BLM, TR1737-9, 1993).

The term "Proper Functioning Condition" is used to describe both the assessment process and the condition of a specific riparian/wetland area. PFC assessments provide a consistent approach that

considers indicators such as hydrology, vegetation, erosion, and depositional processes in the evaluation of the condition of riparian/wetland areas. A specific riparian area whose condition is designated to be “at PFC” is in a state of resiliency that will hold together during high-flow events with a high degree of reliability. The indicators are applied as appropriate to the potential of the ecological site. Riparian areas rated PFC are also considered to be meeting Rangeland Health Standard 2.

Proper Functioning Condition assessments were conducted on stream riparian habitat within the Upper Wind River, Dubois area. 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 table displays the detailed information on the reach ratings in the Upper Wind River Dubois area.

#### PFC for Creeks in the Upper Wind River Watershed

Major Stream	Minor Stream or local Spring Source	Stream Type	Miles	Allotment	Reach ID	Date(s) Assessed	Vegetative Community Type	PFC/FAR (upward trend)	NF/FAR (static, down, not apparent)
Geyser Creek	Main Fork	Perennial	.5	Geyser Creek #2108		1998 2011	Grass/ Sedge/ Rush/Mixed Forest	X	
North Fork Crooked Creek	Main Channel	Perennial	1.25	Crooked Creek #2113		1998, 2011	Willow/ Nebraska Sedge	X	
Tappan Creek	Main Fork	Perennial	.75	Tappan Creek #2122		2011	Willow/ Nebraska Sedge	X	
West Fork Tappan Creek	Main Channel	Perennial	2.75	Batrum Mountain #2123		2011	Willow/ Nebraska sedge	X	
Pole Creek	Main Channel	Perennial	.75	Bitterroot 60 #2128		2011	Aspen/ Nebraska Sedge	X	
Wind River	Main Channel	Perennial	.75	Stoney Point #2132		2011	Douglas Fir/Grass/ Sedge/Rush	X	
East Fork Long Creek	Main Channel	Perennial	<.20	Cross 14 2109		1998 2011	Grass/Sedge/ Willow		X FAR Upward Trend
East Fork Long Creek	Main Channel	Perennial	.25	Cross 14 2109		1998 2011	Willow/Grass/ Sedge	X	

## **PFC Assessment Results for the Upper Wind River, Dubois Area**

The interdisciplinary team determined that all of riparian stream miles within the allotments in the Upper Wind River, Dubois area on public lands were rated in PFC except one segment of less than .25 of a mile on Long Creek which was rated at functioning at risk with an upward trend.

Beaver are not common overall, old remnants of old dams and gnawed off aspen trees are still visible reminders of their presence. Beaver can still be found on public land riparian areas, but are scattered and rare, occupying a fraction of historical habitat. Beaver activities are evident in private land irrigated meadow areas. The processes that occur with the hydrologic modification by beaver are natural, so many areas in stages of readjustment are normal under these influences. In some instances, conifer encroachment into historical beaver habitat has completely altered the habitat, making it unsuitable for beaver use due to a lack of suitable dam/lodge building materials and preferred food sources. Some of the gradient readjustment and revegetation of dams and ponds that comes after the beaver have gone seems to be actively occurring at this time, although there are instances where it has already successfully occurred, or has yet to earnestly begin. The riparian evaluations revealed that throughout the valley, this process can still be observed. In many cases, historical beaver activity has readjusted through natural processes, and has resulted in intermittent stream channels with scattered seep sites emerging from old pond areas, classified as lentic.

### **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.

#### **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.

**Resource conditions in the allotment meet the standard? Yes**

Rationale: Data collected in the Upper Wind River, Dubois Area that pertain to this standard include: step-point cover transects; landscape level assessments using the 17 Indicators of Rangeland Health and other field observations.

On a broad scale, this information is based on the ecological range sites with the various allotments. On a smaller scale these classifications, based on soil mapping units, include other ecological (range) sites. When evaluating the Standards for Rangeland Health in the Upper Wind River, Dubois area, care was taken to concentrate on the predominant ecological (range) sites that were known to be present on the landscape.

The 33 Rangeland Health Indicator Evaluation Matrices completed in 2011 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 soil and site stability and hydrologic function will pertain to Standard I and 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 to provide supporting information for interpreting the biotic indicators. For summaries of the results of this process see Table 3, Biotic Qualitative Assessment Summary.

As the table illustrates, the vast majority of the upland plant communities in the Upper Wind River, Dubois area are meeting the Standard for Watershed Health. Table 3 outlines the findings at all 33 sites throughout the watershed where the IDT completed the 17 Indicators of Rangeland Health evaluation matrix. Upland sites where biotic integrity was 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. Based on the data collected, this standard is met.

**Table 3. Upland Qualitative Assessment Summary**

Watershed	Ecological Site	Allotment Name and Number	Plant Association	Degree of Departure From Expected
				Biotic Integrity
Upper Wind River	Loamy 10 – 14 E	Lime Kiln Gulch #2103	Bluebunch wheatgrass/ Mixed Grass/Mixed shrub	Slight to Moderate
		Little Warm Springs Canyon #2104,		None to Slight
		Little Horse Creek #2110		Slight to Moderate
		Mason Draw #2121		None to Slight
		Battrum Mountain #2123		None to Slight
		Albright 47 #2125		None to Slight

		Wagon Gulch #2127 Bitterroot 60 #2128		None to Slight
Upper Wind River	Shallow Loamy 10-14 E	Geyser Creek #2108	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight
		Cross 14 #2109		None to Slight
		Blue Holes #2117		None to Slight
		Windy Ridge #2120		Slight to Moderate
		Tappan Creek #2122		None to Slight
	Coarse Upland 10-14 SE	EA Mountain #2111	Bluebunch Wheatgrass/ mixed shrub	None to Slight
		Blue Holes #2117		None to Slight
		Mason Draw #2121		None to Slight
		CM 49 #2126		None to Slight
		Stoney Point #2132		None to Slight
Coarse Upland 15-19 E	Fire Ridge #2106, Wells 11 #2107	Mixed Grass/ Bluebunch/Mixed Shrub	None to Slight	
	Geyser Creek #2108	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight	
	Cross 14 #2109		None to Slight	
	Elk Ridge Southeast #2116		None to Slight	
White Pass #2119	None to Slight			
	Shallow Loamy 15-19 E	EA Mountain#2111	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight
		Crooked Creek #2113	Bluebunch Wheatgrass/ Mixed Shrub	None to Slight
		Hat Butte #2115	Mixed Grass/Mixed Shrub/Forest	None to Slight
	Gravelly 15-19E	CM 49 #2126	Bluebunch	None to Slight

			Wheatgrass/mixed grass/ mixed shrub	
	Loamy 15-19 E	Cross 67 #2130	Bluebunch wheatgrass/ Mixed Grass/Mixed shrub	None to Slight

**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.

**Resource conditions in the allotment meet the standard? Yes**

**RATIONALE:** The leases have healthy riparian areas and upland areas as described under Standards No.2 and No.3. The condition of these habitats directly affects the quality of the habitat they provide for wildlife. Riparian habitats typically support the greatest variety of birds and mammals due to the presence of water and the species and structural diversity of plant community. The conditions discussed under Standard No.2 indicate the riparian areas are in proper functioning condition. The conditions described have resulted in maintaining the amount of available habitat and, subsequently, maintaining the kinds and numbers of animals these areas can support.

The habitat needed to support healthy wildlife populations including proposed, threatened, and endangered species, is generally in good condition. Elk and pronghorn herds are above Wyoming Game and Fish Department (WGFD) population objectives and mule deer and bighorn sheep are at or below desired objectives. WGFD biologists are proposing to reduce the mule deer objective as they feel the current objective has never been, or never will be, attainable. The bighorn sheep herds have been

reduced through disease; therefore numbers are below desired objectives due to sickness and not as a result of habitat health. The WGFD does not have a current population estimate for moose but believe the population is stable.

Since big game species occupy habitats utilized by other wildlife species that are more difficult to inventory and monitor, the presence of big game is typically used to indicate the availability and suitability of habitat for these other wildlife species. Big game herd numbers indicate that allotment lands are capable of supporting healthy herds at or near desired population objectives, therefore it is assumed the lands are also meeting the habitat needs for many other wildlife species including those on the Wyoming BLM Sensitive Species List. Habitat fragmentation is being addressed by the combined efforts of the Wyoming Game and Fish, U.S. Forest Service, The Nature Conservancy, private land holders and the Bureau of Land Management in the acquisition of various game winter ranges and conservation agreements that limit rural development.

Browse transect data collected by the ID team during 2011, indicates that on an overall basis the browse community in the Upper Wind River, Dubois area is generally supporting the needs of the wildlife that depend on it. (See table 4). This data is also supported by the information in the discussed in Standards #2 and #3.

**TABLE 4: Browse Transect Data**

Allotment	Transect	Shrub Species	Wildlife Habitat	Pellets	Percent Lightly Utilized	Percent Moderately to Heavily Utilized	Age Diversity
Blue Holes	01345-T1	Wyoming Big Sagebrush, Rubber Rabbitbrush	Mule Deer and Elk CWR	Elk, Pronghorn, Horses, Mule Deer	100 Wyoming Big Sagebrush	60 Rubber Rabbitbrush	Yes
Lime Kiln Gulch	01348-T1	Black Sagebrush, Mountain Sagebrush	Elk, Mule Deer, and Bighorn Sheep CWR	Mule Deer, Elk, Pronghorn, Bighorn Sheep, Horses, Cattle	100		Some

Plant species on the Wyoming BLM Sensitive Species list that may occur on the allotments include limber pine and Dubois milkvetch. These species were found when conducting the Health Assessments and were determined to not be threatened by impacts from livestock grazing or trampling. Limber pine health is being affected by pine beetle and rust infestations, but livestock grazing is not contributing the loss of limber pine.

There is no suitable habitat in the allotments for the federally listed black-footed ferret, Desert yellowhead, Ute Ladies'-tresses or blowout penstemon and the area does not fall within the Platte River watershed. Grizzly bear, gray wolf, and Canada lynx are species listed under the Endangered Species Act known to occupy the analysis area however there are no BLM lands within designated Critical Habitat for Canada lynx. During formal consultation with the US Fish and Wildlife Service (USFWS), it was determined that livestock grazing would not affect the habitats for grizzly bear, gray wolf, or Canada lynx. It was determined, however, that grizzly bears may be killed or relocated as a result of conflicts with livestock;

therefore, the USFWS issued to the Lander Field Office an “incidental take” of 4 grizzly bears related to livestock grazing activities.

It is determined that the allotments in the assessment area are meeting Standard # 4 and that they are capable of sustaining a diverse mix of plant and wildlife species appropriate to the habitats on a landscape scale.

**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 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 these allotments which are currently listed on the State of Wyoming's impaired water body or monitoring list. Additionally, these allotments contain 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. See attached correspondence from Wyoming DEQ dated March 8, 2004.

**Part 2- Factors related to nonconformance with standards**

No factors related to nonconformance have been identified.

**Part 3- Selected guidelines are necessary to change grazing management.**

Regular monitoring of livestock use is needed to ensure livestock are not causing rangeland health standards to fail. The BLM will continue to work in partnership with Fremont County Weed and Pest to treat and manage noxious weed infestations. The allotments will continue to be managed in the cooperation with the grazing lessees to ensure the terms and conditions of the grazing leases are being followed

**Part 4- Identification of specific actions including permit/lease terms and conditions.**

Modifications to the current leases are needed at this time to incorporate new terms and conditions to address threatened and endangered species and paleontology. It is also recommended that a review of monitoring data be completed at the mid-term, five years from the present time to insure that monitoring data is kept up to date and that the current livestock use continues to maintain upland and riparian health so that any needed changes could occur to help achieve rangeland health objectives 10 years from now. It is recommended that the "I" category allotments be changed to "M" category allotments. New terms and conditions would be as follows:

**ADDITIONAL TERMS AND CONDITIONS:**

Additional terms and conditions reflect existing laws and regulations. These terms and conditions are listed below and pertain to range improvements, cultural resources, predator control actions on public lands and Threatened and Endangered or Special Status Species.

1. Range Improvements: Failure to maintain range improvements to BLM standards in accordance with signed cooperative agreements and/or range improvement permits may result in the suspension of the annual grazing authorization, cancellation of the cooperative agreement or range improvement permit, and/or the eventual cancellation of this permit/lease.
2. Livestock supplements: Feeding supplemental forage on BLM administered lands other than salt or minerals must have prior approval. Forage to be fed or stored [so1] on BLM administered lands must be certified noxious weed-free. Salt and/or other mineral supplements shall be

placed at least one-quarter [so2]mile from water sources or in such a manner as to promote even livestock distribution in the allotment or pasture.

3. Administrative Access: The permittee/lessee shall provide reasonable administrative access across private and leased lands to the BLM and its agents for the orderly management and protection of BLM administered lands.
4. Rangeland Health Standards and Guidelines: The terms and conditions of this lease may be modified if additional information indicates that revision is necessary to conform to 43 CFR 4180.
5. Predator Control: The permittee/lessee and/or his/her employees shall not use or place poison or M-44 devices for prairie dog or predator control on BLM-administered public lands. Predation control actions will be carried out by the Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS), or the Wyoming Game and Fish Department, or whoever has the responsibility for the offending species.
6. Human Remains/Cultural Resources/Paleontological Resources: As a condition of this authorization, the holder of this grazing permit/lease shall comply with the regulations identified in 43 CFR 7 and 43 CFR 10 which are on file at the BLM office. These regulations provide for the protection of archaeological resources, historical resources, paleontological resources, human remains, funerary items, sacred objects, and objects of cultural patrimony. Any cultural and/or paleontological resource (historic, prehistoric, or fossil) discovered by the holder, or any person working on the holder's behalf on public or Federal land, shall be immediately reported to the authorized officer. The holder shall suspend all operations affecting the resource in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values.
7. Gray Wolf: If wolves are encountered and appear to be threatening permitted livestock on the allotment or if livestock depredation occurs and is believed to have been caused by wolves, it should be reported to the Fish & Wildlife Service (406-449-5225 ext. 204), the BLM Field Office (307-332-8400), and the Wyoming Game & Fish Department (307-332-2688) within 24 hours. Livestock carcasses or parts of carcasses should be removed ½ mile from any inhabited dwelling, sleeping area or tent, road, trail or recreation site in as timely a manner as possible. Carcasses should also be removed 100 yards from live water.

Control of wolves on BLM-administered public lands will be carried out by the Animal & Plant Health Inspection Service (APHIS) Wildlife Services in coordination with the Fish & Wildlife Service, the BLM, and the Wyoming Game & Fish Department. If a wolf carcass is found, it should be reported to the law enforcement department of the Fish & Wildlife Service (307-332-7607) and the Fish & Wildlife Wolf Biologist (406-449-5225 ext. 204) immediately.

No disruptive activities are allowed within 330 feet (100 meters) of an identified wolf den site between April 1 and June 30. If a den site is discovered on BLM-administered lands, its location should be reported to the BLM Field Office (307-332-8400) as soon as possible.

8. Grizzly Bear.

Conservation measures identified in the Wyoming BLM's Statewide Programmatic Grizzly Bear BA will help to prevent human/grizzly bear conflicts although livestock/grizzly bear conflicts are likely to continue. The following measures will be applied as terms and conditions to all BLM grazing lease authorizations in the analysis area:

To avoid potential conflicts, all livestock carcasses, or parts of carcasses, will be either packed, dragged, or otherwise transported to a location a minimum of 1/2 mile from any inhabited

dwelling, sleeping area or tent, road, trail or recreation site and be moved at least 100 yards from live water.

All human and prepared livestock and pet food, garbage, and other odorous substances will be stored, handled and disposed of in such a manner as to make it unavailable to bears. Uneaten horse feed should not be left on the ground after feeding livestock. Burying food, garbage, refuse, or grease is prohibited.

## 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.

**Basal cover (area):** The cross sectional area of the stem, or stems, of a plant, or all plants, in a stand. Herbaceous plants are measured at, or near, the ground level; larger woody plants are measured at breast, or another designated, height.

**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.

**Hydrologic cover:** The sum of organic litter (dead plant parts, feces, etc.) and live vegetation basal area. Rock and bare mineral soil are not included.

**Density of herbage (vegetative) cover:** Consists of general estimates of overhead (vertical) ground cover for the current year's growth of all usable vegetation on a given range type. Density is recorded as the decimal proportion of the ground that is covered as viewed from directly above. Values for each species are obtained through composition estimates of the percentage of total density attributable to each. These two estimates are made concurrently as the examiner traverses the type.

**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.

**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.

**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.

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

## LITERATURE CITED

Packer, Paul E. 1951. *An Approach to Watershed Protection Criteria*. Journal of Forestry 49(9):639-644.

United States Department of Agriculture. Natural Resources Conservation Service. National Range and Pasture Handbook. 2001. Washington, D.C.

United States Department of Agriculture. Natural Resources Conservation Service. 1997. *Cooperative Soil Survey of the Natrona County Area, Wyoming*. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

United States Department of Agriculture. Natural Resources Conservation Service. 1993. *Cooperative Soil Survey of the Fremont County, East Part and Dubois Area, Wyoming*. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

United States Department of Agriculture. Natural Resources Conservation Service. 2001. Soil Quality Information Sheet (Rangeland Sheet 6) *Rangeland Soil Quality – Organic Matter*. Washington, D.C.

United States Department of the Interior. Bureau of Land Management. 1959. Deming Two-Phase Range Condition Survey East Granite-Rattlesnake Unit. Unpublished. Lander Field Office 4400 Range Management Files. Lander, Wyoming.

United States Department of the Interior. Bureau of Land Management. 1975. Phase I Watershed Survey Sweetwater Rocks No. 358 and Dry Creek No. 351 Units. Unpublished. Lander Field Office 7220 Watershed Management Files. Lander, Wyoming.

United States Department of the Interior. Bureau of Land Management. 1983. Range (Ecological) Site Condition Survey Gas Hills Planning Unit. Unpublished. Lander Field Office 4410 Range Management Files. Lander, Wyoming.

United States Department of the Interior. Bureau of Land Management. 1998. Riparian Area Management TR 1737-15. *A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas*. National Applied Resource Sciences Center. Denver, Colorado.

United States Department of the Interior. Bureau of Land Management. 1999. Riparian Area Management TR 1737-16. *A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas*. National Applied Resource Sciences Center. Denver, Colorado.

Van Haveren, Bruce P. 2000. *Ground Cover Dynamics in a Sagebrush Steppe Community*. BLM Resource Notes 19:1-2. USDI Bureau of Land Management. Denver, Colorado.

Van Haveren, Bruce P. 2001. *Landscape Stability Indicators for Sagebrush Steppe Ecosystems*. BLM Resource Notes 44:1-2. USDI Bureau of Land Management. Denver, Colorado.