

Chapter 3

Affected Environment

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes existing conditions of cultural, physical, biological, and socioeconomic resources in the Green Mountain Common Allotment. Past environmental analyses have revealed that the following critical elements of the human environment are either not present in the GMCA allotment or will not be affected: air quality, sole-source drinking water, prime or unique farmlands, hazardous/solid wastes, and environmental justice. In addition to the above, the following elements are also not affected: forest management, fire management, lands and realty, minerals, paleontological resources, transportation, public health and safety, and noise.

GENERAL SETTING

Location

Green Mountain Common Allotment is located south of the Sweetwater River from the Rock Springs Field Office boundary to Sweetwater Station and South of U.S. Highway 287 from Sweetwater Station to Jeffrey City. The allotment lies within the following boundary: Townships 25-27 North, and Ranges 92-98 West (See Map 1-1).

The allotment is composed of a mixture of public, private, and state lands (lands managed by the Office of State Lands and Investments). Private and state lands are scattered throughout the allotment. The private and some state lands are generally located adjacent to water courses or springs. Many parcels of private and state lands within the external boundaries of the allotment have been fenced separately from the allotment. These in-holdings are not considered part of the allotment. Table 3-1 describes the amount of acres by ownership, AUMs, and percent of AUMs within the GMCA:

Table 3-1. Total Acres with Ownership within the GMCA

Land Status	Acres	AUMs	Percent of AUMs
Public	468,407	47,729	86
State	35,058	4,995	9
Private	18,825	3,024	5
Totals:	522,290	55,748	100

The total numbers of acres are approximate, and are based on information generated through the BLM's Geographic Information System (GIS). The BLM does not guarantee the total acreage to be definitively accurate.

Topography and Elevation

General topography in this allotment varies from flatlands to mountains with drainages and rolling hills throughout. Elevations range from 6,361 feet near Cottonwood Creek in the northeast corner of the allotment to 9,072 feet at Sagebrush Park on Green Mountain. Green Mountain and Crooks Mountain lie across the allotment in an east/west direction.

Climate

With the exception of Green Mountain and Crooks Mountain, the climate of this area is semiarid cold desert. The mountains have a subhumid continental climate.

Temperatures can range from winter lows of almost -50 degrees Fahrenheit to summertime highs of in excess of 100 degrees. Annual air temperatures on the sagebrush-covered rangelands averages 33 to 45 degrees Fahrenheit, and, on forested mountain areas, 33 to 38 degrees. South Pass City, which is located about ten miles west of this allotment, has a five years in ten last freeze date of June 26, and a five years in ten first freeze date of August 12. About ten miles east of the allotment, Muddy Gap has a five years in ten last freeze date of May 29 and a first freeze date of September 16, a roughly two month longer growing season than South Pass City's.

Long-term average annual precipitation varies throughout the allotment, with 4.93 inches at Lost Creek Reservoir,

5.62 inches at Picket Lake, 6.23 inches at Bison Basin, 8.50 inches (1960-2007) at the Sweetwater Enclosure (along the Happy Springs Road), and 18.93 inches on Green Mountain. As can be seen from this data, the lowest precipitation occurs in the Great Divide Basin and the most on Green Mountain. Half of this precipitation occurs in the period between April and June, with a secondary peak in the fall. Most of the precipitation occurs as snow.

In the period between 1985 and 1995, the Sweetwater Enclosure rain gauge recorded three years (1992, 1993, and 1995) of above-average moisture and eight years with below-average moisture. The long-term average (1960-1984) annual precipitation for the period was 9.80 inches. The average annual precipitation for the period from 1985 through 1995 was 9.05 inches. The year 1995 was the wettest year in the period with 13.75 inches of moisture. The driest year was 1990 with 5.35 inches of moisture; 1994 was the second driest year of this period with only 6.49 inches.

In the period between 1996 and 2007, the Sweetwater Enclosure rain gauge recorded three years (1997, 1998, and 2004) of above-average moisture and nine years with below-average moisture. The long-term average (1960-1995) annual precipitation for the period ending in 1995 was 8.95 inches. The average annual precipitation for the period from 1996 through 2007 was 7.14 inches. The year 1997 was the wettest year in the period with 9.27 inches of moisture. The driest year was 2006 with 3.30 inches of moisture; 2002 was the second driest year of this period with only 5.69 inches.

In the period between 1999 and 2007, the Sweetwater Enclosure rain gauge recorded one year (2004) of above-average moisture and eight years with below-average moisture. The long-term average (1960-1998) annual precipitation for the period ending in 1998 was 8.90 inches. The average annual precipitation for the period from 1999 through 2007 was 6.74 inches. The year 2004 was the wettest year in the period with 8.59 inches of moisture. The driest year was 2006 with 3.30 inches of moisture; 2002 was the second driest year of this period with only 5.69 inches.

It is evident from this brief analysis of the Sweetwater Enclosure rain gauge data that during the last nine years (1999-2007) precipitation in this portion of the GMCA has been considerably below the long term average.

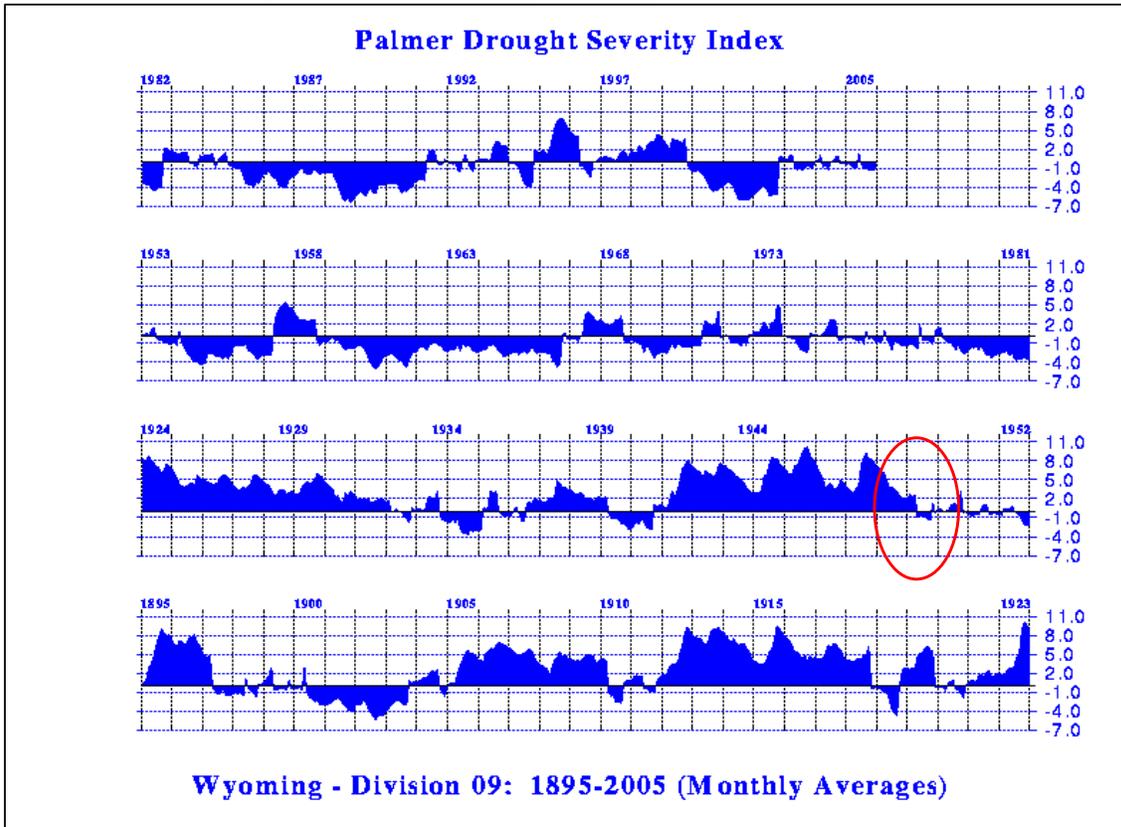
Climatic Conditions Affecting the GMCA

The present drought that the area is experiencing began in about 2000. The severity of recent dry conditions is unprecedented. Present native vegetation production has been substantially decreased in these years. This is also reflected in the voluntary and negotiated non-use, and decreased levels of use, by livestock operators, over this period.

The Palmer Drought Severity Index (PDSI, known operationally as the Palmer Drought Index (PDI)) attempts to measure the duration and intensity of the long-term drought-inducing circulation patterns (see Figure 3-1, below). Long-term drought is cumulative, so the intensity of drought during the current month is dependent on the current weather patterns plus the cumulative patterns of previous months. Since weather patterns can change almost literally overnight from a long-term drought pattern to a long-term wet pattern, the PDSI (PDI) can respond fairly rapidly.

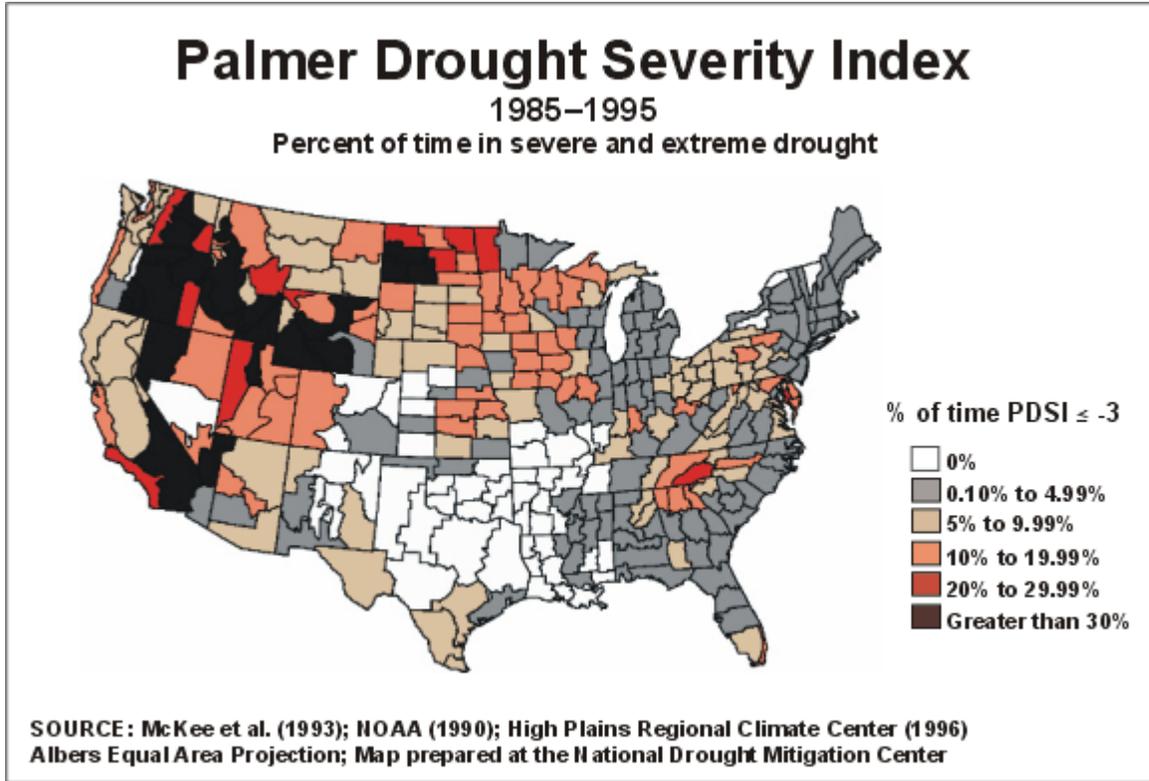
As can be seen in the PDSI figure below, the first fifty years of the last century were wetter, on average, than those of the last half.

Figure 3-1. Palmer Drought Severity Index from 1895-2005



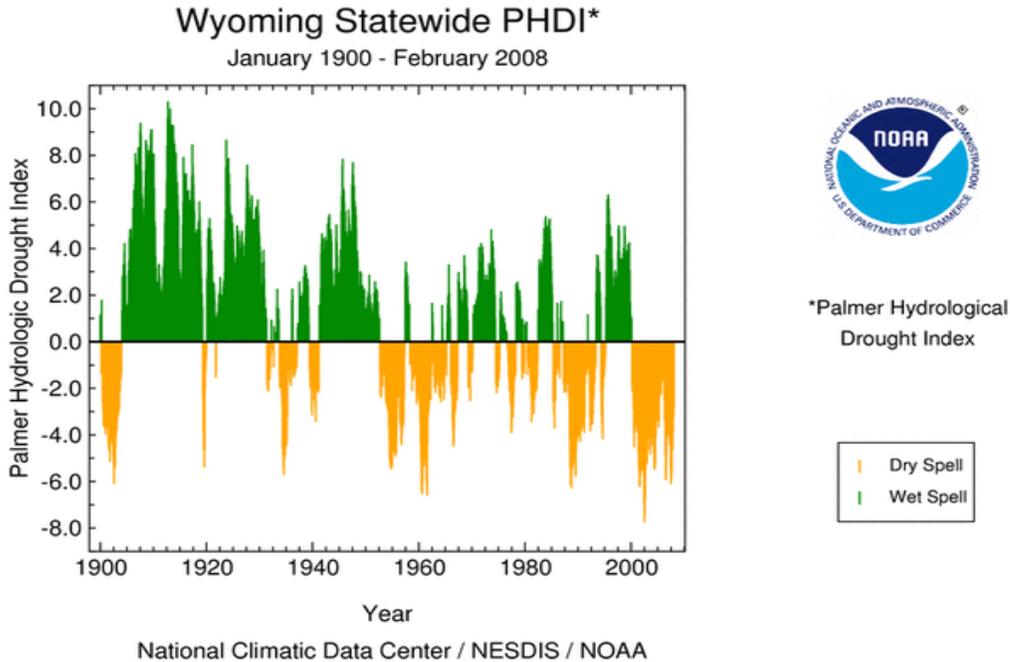
In the PDSI map shown below, the percent of time the area encompassing the GMCA has been in severe and extreme drought has risen to greater than thirty percent in recent years. Although the map only dates through 1995, the recent drought has extended through 2007 and has affected most of the area within the GMCA.

Figure 3-2. Palmer Drought Severity Index (PDSI) from 1895-2005



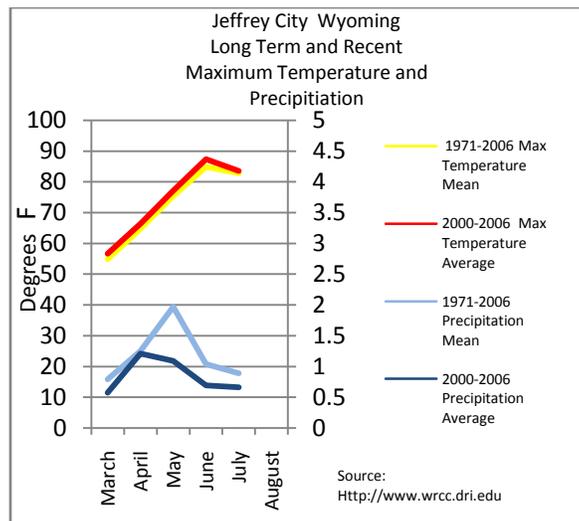
The graph below depicts the hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.). As these impacts take longer to develop, it takes longer to recover from them. The Palmer Hydrological Drought Index (PHDI), another long-term drought index, was developed to quantify these hydrological effects. The PHDI responds more slowly to changing conditions than the PDSI (PDI).

Figure 3.3. Wyoming Statewide Palmer Hydrological Drought Index



Below are plotted the temperatures and precipitation for Jeffrey City during the period 2000 through 2006. As can be seen, temperatures for this period have been one to three degrees higher and critical spring precipitation has been consistently below the long term average.

Figure 3-4. Long-Term and Recent Maximum Temperature and Precipitation Data



AFFECTED RESOURCES AND LAND USES

SOIL AND WATER RESOURCES

Soil Resources

The GMCA contains diverse kinds of soils, from cold, sub-humid mountain soils to warm and cool, semiarid soils on dunes (see Map 3-1).

Single and multi-year droughts are not uncommon. Growing seasons are generally short, with a geographic tendency to become longer from west to east. Table 3-2 presents freeze date information for two locations just over the western and eastern boundaries of the allotment.

The bulk of annual precipitation occurs in the spring, typically beginning in late March, peaking in May, and finally declining rapidly in June. A minor but important second peak occurs during the fall period, September through November. This fall moisture can initiate a second period of growth for cool-season grasses, but more importantly, it will ensure a good frost seal for the soils. This pre-wetting seal allows for the deep permeation of spring precipitation into the soil profile for use by the more desirable, deeper-rooted native grasses and shrubs. Storing moisture deep in the soil profile will ensure its availability for later use. These are the same reasons farmers and ranchers irrigate fields in the fall after harvest, and also why surge irrigation is used to slowly wet a field on a gradient from the highest end to the lowest. This pre-wetting of the soil ensures that water infiltrates into the soil instead of running off as waste and/or leading to erosion. Figures 3-5 and 3-6 illustrate the climate parameters of temperature and precipitation at Jeffrey City.

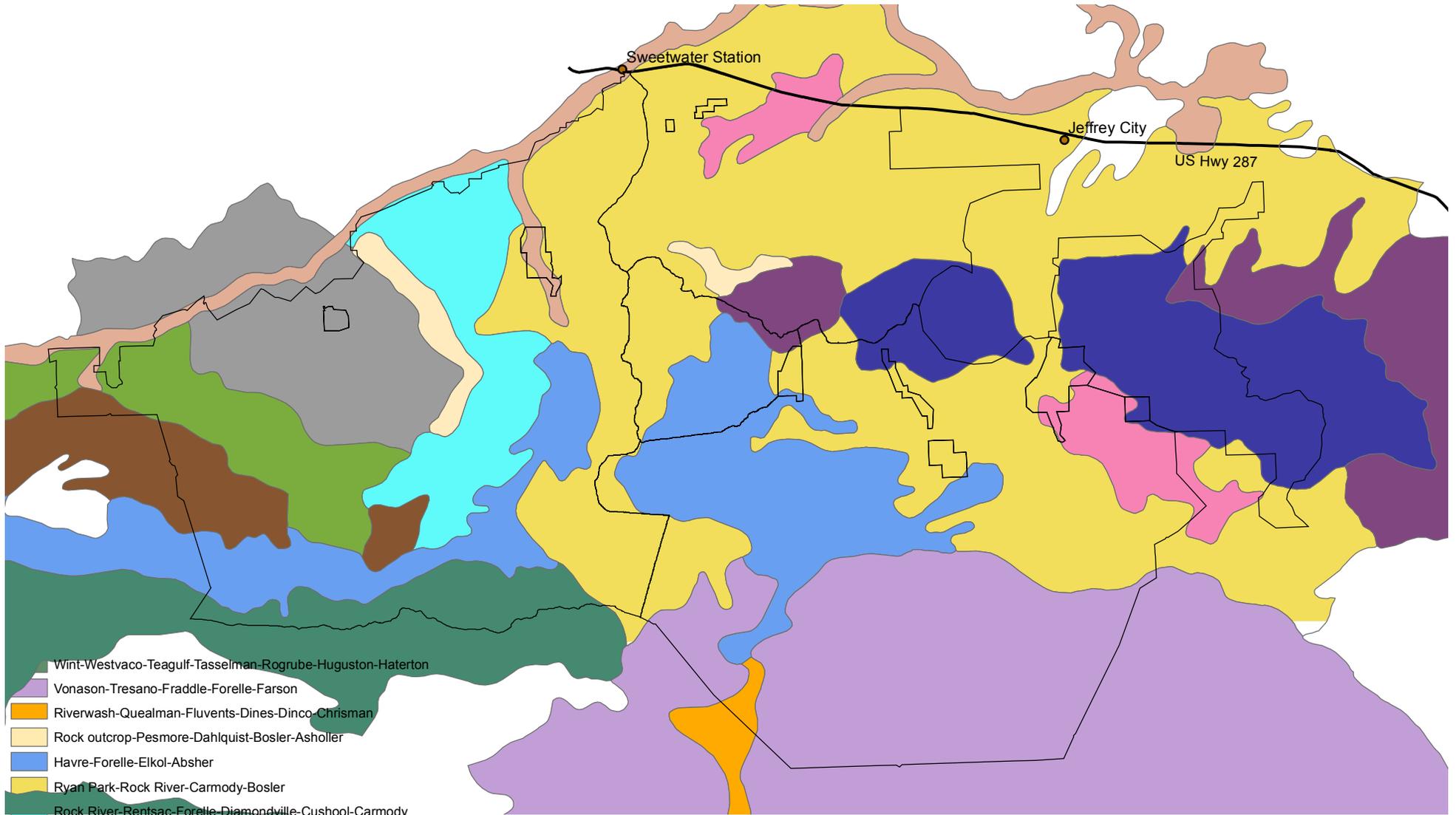
Soils in the western portion of the allotment are commonly underlain by plutonic granitic rocks with mafic intrusions. This portion of the allotment contains the most rock outcrops. Elevations in this area range from 7,000 to 8,500 feet. Slopes vary from nearly level to steep (zero to 65 percent slope). Soils are well-drained, very shallow (less than 10 inches) to moderately deep (20 to 40 inches), and are loamy or gravelly/loamy in texture. These soils are mostly associated with hills, ridges, escarpments, fan aprons, and pediments. Numerous seeps, springs, and wet meadows can be found here, unlike the majority of the allotment (except for the Green Mountains). Water erosion exists as the dominant form of erosion in this area. The annual precipitation in this part of the allotment is 10 to 14 inches, but effective precipitation is lower due to desiccating winds. The growing season remains short, with 60 to 90 frost-free days.

South of Cyclone Rim, the soils have formed in a Wasatch Formation member that is comprised of variegated claystones and lenticular sandstones, some of which may be conglomeritic. Elevations in this area range from 6,300 to 7,500 feet. Slopes vary from nearly level and gently sloping to very steep. These soils are generally well-drained and very deep (greater than 60 inches). Soil textures are loamy, and these soils commonly occur on floodplains, terraces, toe slopes, and fan aprons. Here, both wind and water are effective agents of erosion. The annual precipitation is seven to 14 inches, but effective precipitation is significantly less. The frost-free growing season is 80 to 110 days.

Green Mountain and Crooks Mountain are covered by a thick layer of giant boulder conglomerate; as a result, many of the soils here possess a large percentage of coarse fragments (i.e., gravels, cobbles, stones, and boulders). Elevations range from 7,500 to about 9,000 feet. Slopes typically vary from nearly level to very steep (zero to 75 percent slope). Soils here are well-drained, but can be poorly drained in the less-sloping areas on top of the mountains. Textures vary from cobbly loam, loamy, or gravelly loam. Water erosion is the dominant form of erosion on Green Mountain. Annual precipitation on the tops of these mountains is 18 to 22 inches, and the frost-free period ranges from 40 to 60 days.

To the south of Green Mountain, the Battle Spring Formation gives rise to well-drained loamy, gravelly, and sandy-textured soils that range in depth from shallow (less than 20 inches) to very deep. They occur on nearly level to steep and very steep slopes. These soils formed on terraces, toe slopes, fan aprons, hills, ridges, and sand dunes. Wind erosion is the dominant form of erosion in the dune areas. West of the dunes, both wind and water are important agents of erosion. Elevations in this area generally range from 5,700 to 8,000 feet. The annual

Map 3-1: General Soil Association Units - USDA NRCS Wyoming 2006



- Wint-Westvaco-Teagulf-Tasselmann-Rogrube-Huguston-Haterton
- Vonason-Tresano-Fraddle-Forelle-Farson
- Riverwash-Quealman-Fluvents-Dines-Dinco-Chrisman
- Rock outcrop-Pesmore-Dahlquist-Bosler-Asholler
- Havre-Forelle-Elkol-Absher
- Ryan Park-Rock River-Carmody-Bosler
- Rock River-Rentsac-Forelle-Diamondville-Cushool-Carmody
- Rock River-Milvar-Milren-Dahlquist
- Venapass-Silas-Lander variant-Lander
- Zeomont-Ryark-Ryan Park
- Youga-Quander
- Lymanson-Irigul-Hoodle
- Rock outcrop-Lymanson-Hoodle-Gelkie
- Rock outcrop-Cryluha-Coutis-Conpeak

This map was derived from USDA-NRCS STATSGO general soils map information and is used here to illustrate the variation in soil in the GMCA. Map unit descriptions have not yet been written by USDA NRCS for these map units. Information on individual soil series can be found in the USDA NRCS Fremont County East Part and the Dubois Area soil Survey and on the internet at: <http://soils.usda.gov/technical/classification/osd/index.html>.



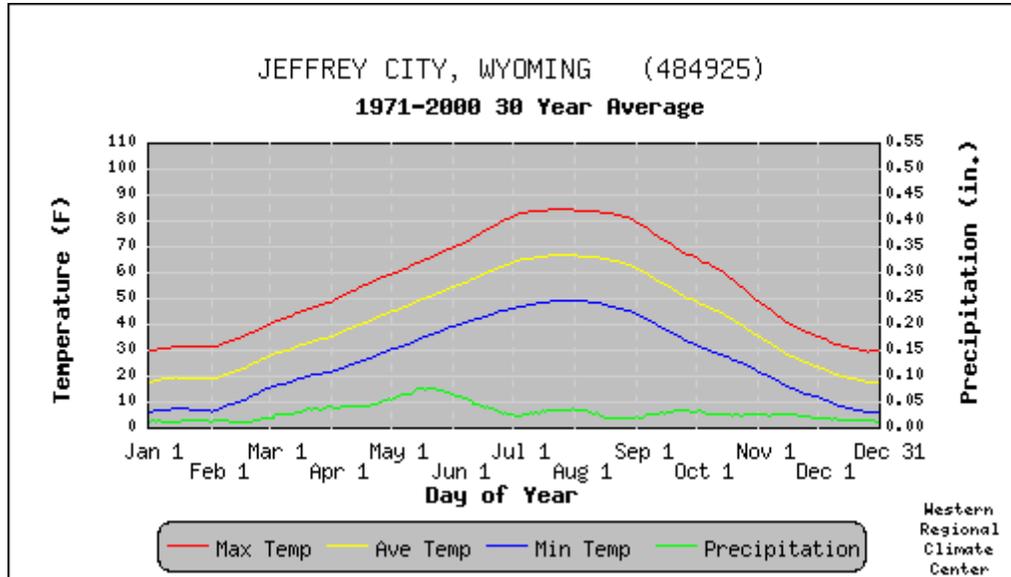
NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

Table 3-2. Freeze Dates in Spring and Fall Recorded at South Pass City and Muddy Gap

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
SOUTH PASS CITY*			
<i>Last freezing temperature in the period January through June:</i>			
1 year in 10 later than--	June 27	July 3	June 30
2 years in 10 later than--	June 30	June 28	June 29
5 years in 10 later than --	June 7	June 18	June 26
<i>First freezing temperature in the period August through December:</i>			
1 year in 10 earlier than--	Aug. 16	Aug. 2	Aug. 27
2 years in 10 earlier than--	Aug. 23	Aug. 9	Aug. 1
5 years in 10 earlier than --	Aug. 4	Aug. 23	Aug. 12
MUDDY GAP*			
<i>Last freezing temperature in the period January through June:</i>			
1 year in 10 later than--	May 10	May 28	June 15
2 years in 10 later than--	May 6	May 23	June 9
5 years in 10 later than--	Apr. 28	May 13	May 29
<i>First freezing temperature in the period August through December:</i>			
1 year in 10 earlier than--	Sept. 18	Sept. 10	Sept. 5
2 years in 10 earlier than --	Sept. 25	Sept. 15	Sept. 9
5 years in 10 earlier than--	Oct. 7	Sept. 25	Sept. 16

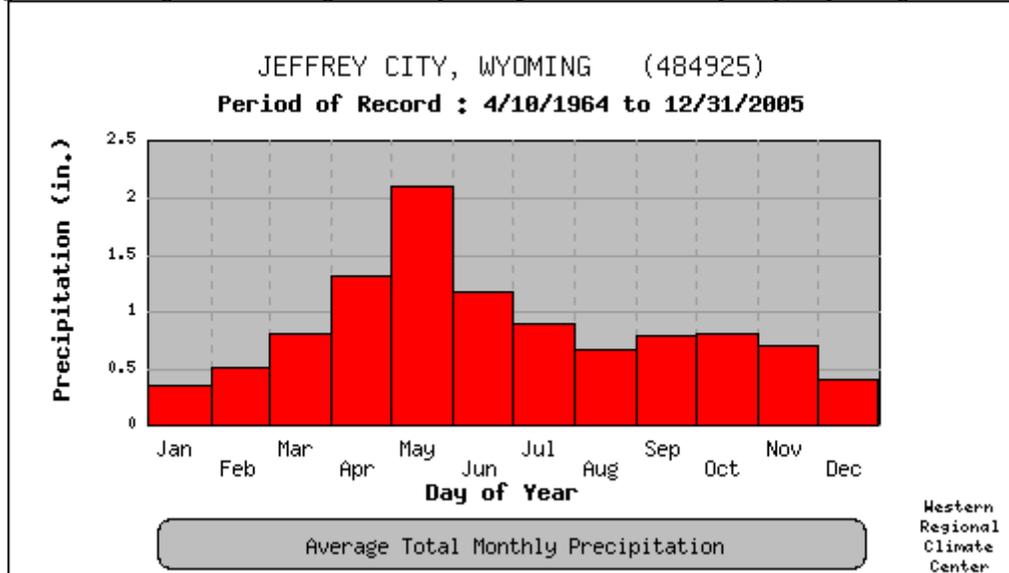
* The period of record is as follows: South Pass City, 1951-81 and Muddy Gap 1950-90. (From the USDA NRCS Soil Survey of Fremont County, East Part, and the Dubois Area, Wyoming, 1993.)

**Figure 3-5. Long-Term Temperature and Precipitation Data for Jeffrey City, Wyoming
(1971 - 2000 Temperature and Precipitation)**



Data is smoothed using a 29-day running average.

- Max. Temp. is the average of all daily maximum temperatures recorded for the day of the year between the years 1971 and 2000.
- Ave. Temp. is the average of all daily average temperatures recorded for the day of the year between the years 1971 and 2000.
- Min. Temp. is the average of all daily minimum temperatures recorded for the day of the year between the years 1971 and 2000.
- Precipitation is the average of all daily total precipitation recorded for the day of the year between the years 1971 and 2000.

Figure 3-6. Long-Term Average Monthly Precipitation for Jeffrey City, Wyoming (1964-2005)

■ - Average precipitation recorded for the month.

precipitation for this part of the allotment is about 10 to 14 inches. The frost-free period is 80 to 110 days. This southeastern area has the longest frost-free period in the allotment.

Relevant historical background information can be found in the BLM's Phase 1 Watershed Conservation and Development (WC&D) inventory, conducted in the mid-1970s. Two significant kinds of information from this period are ground cover estimates and erosion condition classes.

Good upland watershed condition is necessary for the maintenance of healthy lowlands and acceptable water quality, and also keeps both wind and water erosion at levels that permit soil formation. The amount of bare ground and, conversely, vegetation present is critical in keeping erosion to tolerable levels for the maintenance of soil productivity. Rill and gully erosion are typically the dominant forms of water erosion in this region. Sufficient amounts of ground cover in the uplands protect against rill and gully formation.

Phase 1 WC&D inventory, located in the Lander Field Office files, contains raw transect data for the GMCA. As can be seen from this data, most of the transects recorded have bare ground estimates for the tall sagebrush type (number 041) and low sagebrush type (number 042) of less than 35 percent. Vegetative cover estimates range roughly from 20 to 45 percent, comparable to the vegetative cover estimates given in the United States Department of Agriculture-Natural Resource Conservation Service (USDA-NRCS) Range Site Guides. The Sandy, Loamy, and Clayey range sites in the 10- to 14-inch Precipitation Zone High Plains Southeast, seven- to nine-inch Precipitation Zone Green River and Great Divide Basin, and 10- to 14-inch Precipitation Zone Foothills and Basins West Major Land Resource Areas (MLRAs) comprise the majority of the acreage in the GMCA.

The Soil Surface Factor (SSF) figures in the Lander Field Office files show soil condition classes recorded at the time of the Phase 1 WC&D inventory. These were computed by assigning values to seven soil surface factors (SSF) and adding them for a total score. That number then determined which condition class the investigated site fit into: Stable 0-20; Slight 21-40; Moderate 41-60; Critical 61-80; or Severe 81-100. Those condition classes are compared to projected future condition classes under different management scenarios. As can be seen, little change was expected to occur in the uplands with or without management changes.

From the Phase 1 WC&D inventory, one could conclude that upland erosion was at acceptable levels during the time of the inventory. The consensus of BLM personnel who spend much time in this allotment is that conditions have not changed much in the uplands since the time of the Phase 1 WC&D inventory.

The SSF alone does not tell the whole erosion story, as lowland sites were not included in the Phase 1 WC&D inventory. In some areas, like this allotment, where rill and gully erosion are the predominant forms of erosion by water, some researchers have found that approximately 75 percent of the sediment reaching a basin outlet can be derived from channel erosion and gully erosion (Trimble, 1974; Trimble, 1976; Trimble, 1981; Heusch, 1980). Thus, most of the sediment moving through the lowland systems is generated in those lowlands, not from the uplands. This sediment can still adversely affect water quality and fish habitat.

Water Resources

A general overview of water quality and availability can be found in the Affected Environment sections of the Green Mountain Grazing EIS (1982) and the Lander RMP (1986). The first of these documents contains a table that presents water consumption by large grazing animals in the Green Mountain Grazing EIS area. About 172 acre feet per year were calculated to be consumed; for the 300 reservoirs in the EIS area, about 1,620 acre feet of water are lost through evaporation. Both documents state that most of the perennial streams have good water quality. Both documents describe fecal coliform, suspended sediment, and total dissolved solids as being of special concern, as they would be the most sensitive detectors of poor water quality resulting from adverse environmental impacts. Also, see Section 3.3.6.5, Affected Environment; Special Status Species, for a brief discussion of the Platte River Depletion allowance, which is primarily concerned with threatened and endangered species conservation.

As the State of Wyoming biennially updates the State Water Quality Assessment Report, also known as the 305(b) Report, and the Impaired Waterbody List, also known as the 303(d) List, water quality standards and water quality classification changes would be incorporated into the management of the allotment.

There are provisions of the Clean Water Act that deal with instituting measures (i.e., Best Management Practices) to improve the water quality of streams that are known to not meet the needs of designated beneficial uses and/or violate surface water quality standards. These BMPs are developed with State of Wyoming oversight. Further, Executive Order 11752, December 17, 1973, mandates that federal agencies shall provide national leadership to protect and enhance the quality of air, water, and land resources through compliance with applicable federal, state, interstate, and local pollution standards (BLM Manual 7200.03.B.4). These streams can be found on the 2006 WDEQ Impaired Waterbody List, also known as the 303(d) list. There are several subsections to the 303(d) list:

- 1) “Impaired waterbodies” are those streams which have been subjected to a state’s stream assessment process and found to not be meeting water quality standards/designated beneficial uses.
- 2) “Waterbodies to be monitored” are those streams which have been nominated to the impaired waterbodies list in the past, but for which there is not sufficient information to make an assessment at this time without further monitoring studies being conducted. All such waterbodies will be monitored and assessed over the next several years by the WDEQ.
- 3) “Waterbodies to be delisted” are those waterbodies previously nominated to the past 303(d) lists for which sufficient information exists for an assessment of non-impairment/meeting state water quality standards to be made.

No impaired waterbodies occur in the GMCA at this time. Crooks Creek is listed as an impaired waterbody for oil and grease contamination just outside the GMCA boundary.

According to the 305(b) Report of 2006, “Ambient monitoring of Crooks Creek, a tributary of the Sweetwater near Jeffrey City, revealed a significant amount of oil in sediments, a violation of water quality standards. The source of oil is unknown at this time, but this stream is a high priority targeted water on Table A of the 303(d) (Impaired Waterbody) list, and is scheduled for TMDL development” (p. 54).

Several streams do occur on WDEQ’s list of “waterbodies to be monitored” on the BLM public lands: 4.97 miles of West Cottonwood Creek (waterbody ID WYNP10180006-558-1), 3.23 miles of the West Fork Middle Cottonwood Creek (waterbody ID WYNP10180006-215-2), and 3.73 miles of Mormon Creek (waterbody ID WYW10180006-549-1). The status of these and several other streams can be seen in Table 3-3.

Table 3-3. Status of WDEQ Stream Monitoring (GMCA)

Name	Waterbody ID	Class	Year Scheduled	Year Monitored	Decision
Cottonwood Creek	WYNP10180006215-2	2AB	1999	2000	
Cottonwood Creek	WYNP10180006558-1	2AB	1999	2000	M-2005
Willow Creek	WYNP10180006	2AB	1999	2000	
Mormon Creek	WYNP10180006-549-1	2AB	1999	2000	M-2000, M-2003, M-2004,
Sweetwater River from junction with Alkali Creek and upstream	WYNP10180006				Delisted from impaired status in the late 1990s.
Granite Creek	WYNP1010006			2000	M-2005
Crooks Creek From: T28N, R92W Sec. 18 SWNE and downstream.	WYNP10180006	2AB			I-1998
M= Additional monitoring needed					

Surface waters of the State of Wyoming are placed, by WDEQ, into subclasses under one of the appropriate four classes of water quality:

- 1) **Class 1** (most stringent standards) waters are those waters in which no further degradation of water quality will be allowed. In this allotment, portions of the Sweetwater River above its confluence with Alkali Creek and any tributaries that are not designated differently are Class 1 waters (see Appendix 7) for the full WDEQ definitions of the various classes of waters in the state).
- 2) **Class 2** waters are waters other than those designated as Class 1 that presently support, or have the potential to support, game fish or drinking water supplies.
- 3) **Class 3** waters are waters other than those designated as Class 1 that are intermittent, ephemeral, or isolated waters that do not have the potential to support fish. These waters do provide support for invertebrates, amphibians, or other flora and fauna which inhabit waters of the state at some stage in their life cycles.
- 4) **Class 4** waters are waters other than those designated as Class 1, where it has been determined that aquatic uses are not attainable pursuant to provisions of Section 33 of these regulations (WDEQ Water Quality Rules and Regulations, Chapter 1, Wyoming Surface Water Quality Standards, April 25, 2007). Uses designated on Class 4 waters include recreation, wildlife, industry, agriculture, and scenic value. Ditches and canals also have this designation.

The Class 1 (most stringent standards) waters in the allotment are those portions of the Sweetwater River above its confluence with Alkali Creek and any tributaries that are not designated differently. A list containing all the waterbodies as classified in the 1990 WDEQ Water Quality Rules and Regulations, Chapter I, is on file in the Lander Field Office. Also located in the Lander Field Office are "those surface waters not designated as Class 1, but whose quality is better than these standards, shall be maintained at that higher standard" (as per WDEQ Water Quality Rules and Regulations: Chapter I, Section 8. Anti-degradation).

Suspended sediment is the most serious surface water pollutant in the allotment. Sediment yield is highest in the GMCA during the spring and summer, when runoff occurs in direct response to spring snowmelt and summer rainfall. Increases in sediment yield will also increase levels of total dissolved solids (TDS), which can be considered synonymous with salinity.

In July of 2004, a list of streams with Proper Functioning Condition (PFC) ratings of Non-Functional, Functional-at-Risk with a downward or no apparent trend, was submitted to WDEQ for the entire Sweetwater watershed in consideration of future plans for water quality/beneficial use support monitoring. A copy of this list is given in Appendix 8.

VEGETATION RESOURCES

General

The GMCA vegetation types consist of meadow, grass, sagebrush, mountain shrubs, conifer, and deciduous trees. Wyoming big sagebrush is the dominant shrub; however, understory species composition is varied and can be differentiated by slope, aspect, and soil properties. The major meadow plants consist of various sedges and rushes. Grass plants on the upland range communities consist of western wheatgrass, bluebunch wheatgrass, threadleaf sedge, prairie junegrass, and needle-and-thread grass.

The conifer community type varies from discontinuous juniper stands at lower elevations to closed canopy lodgepole and mixed lodgepole-spruce stands at higher elevations. The deciduous tree type is composed of willows and cottonwoods along the perennial creeks at lower elevations and shifts to water birch and aspen at higher elevations.

The vegetation for the GMCA is described in more detail in the Green Mountain Grazing EIS (1982), on pages 29-39.

Table 3-4, Forage Condition and Apparent Trend Summary, and Table 3-5, Forage Condition and Apparent Trend Summary, illustrates the most recent assessment of the forage condition and apparent trend in forage condition (resource value rating) on the GMCA. As previously discussed, this data was collected from two different allotment planning efforts conducted in 1975-76 for the old Seven Lakes Allotment (now 40 percent of the total allotment) and in 1977-78 for the old Green Mountain Allotment (now 60 percent of the total allotment).

**Table 3-4. Forage Condition and Apparent Trend Summary¹
Forage Condition (%Acres)**

Allotment (Year)	Good	Fair	Poor	Unsampled
Old Green Mountain (1978)	47%	36%	2%	15%
Old Seven Lakes (1976)*	7%	88%	5%	0%
Old Seven Lakes (1976)**	6%	89%	5%	0%

*Cattle Forage Condition

**Sheep Forage Condition

Table 3-5. Apparent Trend in Forage/Soil Surface Condition (%Acres)¹

Allotment (Year)	Improving	Static	Declining	Unsampled
Old Green Mountain (1978)	66%	17%	1%	16%
Old Seven Lakes (1976)	2%	96%	2%	0%

¹Data obtained from 1976 BLM Seven Lakes Planning Unit Resource Analysis and 1978 BLM Sweetwater Planning Unit Resource Analysis (See Appendix 12).

The most recent allotment-wide description of rangeland conditions and trends can be found on pages 260-276 of the Range Management Unit Resource Analysis (URA) Step III for the Sweetwater Planning Unit. (See Appendix 6) Seven Lakes Incommon Allotment).

2002 Evaluation Update

Introduction

In August 1999, eight permanently located point/line intercept monitoring transects were established by Lander BLM range and wildlife staff. Six of the transects were located within the anticipated service areas of six wells that were drilled by a BLM contractor during the summer and fall of 1999. The purpose of these transects was to evaluate the impact of livestock grazing on ground cover and sage grouse nesting habitat, following changes in the grazing distribution as a result of new water sources. These transects have not been reread since their establishment. Two transects were relocated at sites where temporary step-point transects (Wyoming Integrated Pace Transect Method) were conducted in November 1976 by Rawlins BLM range staff. These step-point transects were originally conducted to collect base line vegetative, watershed, and wildlife data to identify any changes in trend and degree of change in range condition within the Seven Lakes Grazing EIS area.

Within the Arapahoe Use Area, four point/line intercept transects were established within the Eagles Nest Draw Pasture and one transect each was located in the Lost Creek and Bare Ring Butte Pastures. The remaining two transects were located in the Warm Springs Pasture of the Happy Springs Use Area and the Alkali Creek Sheep Use Area.

Evaluation

The Ground Cover Summary Table (Appendix 18) summarizes the percent ground-level cover for all eight of the point intercept transects. The data indicate that there is sufficient ground cover, primarily litter, to protect the soil surface from water and wind erosion at these sites representing approximately 32,000 acres of upland rangeland. Two transects near the County Line Well and Fremont Reservoir measured relatively high levels of bare ground at 34% and 33 % respectively. However, the remaining six transects measured relatively low bare ground that ranged from 8% to 20%. Point-intercept data indicate ground cover at these eight sites ranges from 66% to 92% which research has shown to be sufficient to limit water and wind erosion. The Percent Species Composition Table (also Appendix 18) summarizes percent species composition and the rangeland similarity index, formerly called range condition class, for the eight transect areas. The rangeland similarity index (RSI) is defined as "the present state of vegetation and soil protection of an ecological site in relation to the historic climax plant community for the site" (SRM 1998). The RSI ranges from 50% (mid-seral) to 70% (late-seral) of the historic climax plant community for these sites.

The Rangeland Standards-Conformance Review Summary completed on July 23, 1999, summarizes the remainder of the current data, and concludes for Standard No. 3 that "at the present time, the status of approximately 55-57 percent (285-295,000 acres) of the upland ecological (range) sites is unknown. Upland erosion condition, vegetative cover, and desired plant community are three primary indicators that will be collected and developed. Allotment field inspections will be conducted and monitoring studies will be established during 1999 to complete the conformance determination."

Allotment field inspections have been conducted every year to assess utilization patterns and conduct livestock use supervision. Eight upland range monitoring studies were established in 1999. However, due to limited range and wildlife personnel, there has not been enough upland monitoring studies or field assessments conducted to complete the conformance determination at this time. Over 80 field assessments were conducted in 1958 and 1964 on the "old" Green Mountain Common Allotment (GMCA) to determine vegetative and soil conditions for the adjudication range survey. Over 160 field assessments (transects) were conducted in 1976-77 on the "old" GMCA to inventory range and watershed conditions for the Green Mountain Grazing EIS planning effort. We estimate that approximately 125-130 permanently located upland monitoring transects/assessments are needed to properly determine current rangeland health and trends in vegetative and soil conditions. With this required intensity of monitoring and assessment (one transect for every 4,000 acres) the conformance determination may be completed in time for the next evaluation scheduled for winter 2009-2010.

The East Fremont County Soil Survey is now available in digital form. The remaining 117-122 permanently located upland monitoring transects/assessments will need to be located using a technique called allotment stratification which requires that the ecological (range) sites be correlated with the soil survey. This process would begin next winter and continue until completed.

Summary

Initial data, from eight point intercept transects representing approximately 32,000 acres of upland rangeland,

indicate that there is sufficient ground cover, primarily litter, to protect the soil surface from water and wind erosion prior to completion of water wells that were drilled within ½ to one mile from the transects. The range similarity index for these eight sites ranges from mid-seral to late-seral of the historic climax plant community for these sites. These upland sites are probably meeting the standard. The remainder of the revised unknown category, 253-263,000 acres, cannot be evaluated at this time, due to the limited amount of vegetative information that has been collected since 1999. Additional information is needed for the remaining portion of the upland range to be fully evaluated prior to the next evaluation, scheduled for winter 2009-2010.

Conclusion

Do current upland rangeland resource conditions in the allotment meet the standard? Several partial answers to this question can be provided at this time. Given the landscape scale of the GMCA, there is an enormous variation in upland rangeland conditions. Based on the best available information summarized above, which is somewhat dated, the following general conclusions have been reached:

1. The upland ecological (range) sites immediately adjacent to riparian areas are not meeting the standard. At the present time, this acreage has been estimated at 3-5 percent (15-25,000 acres) of the GMCA.
2. Approximately 46 percent (239,000 acres) of the upland ecological (range) sites are probably meeting the standard.
3. At the present time, the status of approximately 49-51 percent (253-263,000) of the upland ecological (range) sites is unknown.
4. Upland erosion condition, vegetative cover, and desired plant community are three primary indicators that need to be collected and developed. Allotment field inspections will be conducted and monitoring studies need to be established to complete the conformance determination.

Forage Production

The soils of the GMCA north of the Great Divide Basin support a variety of ecological (range) sites. The most extensive are the Shallow Sandy and Shallow Loamy range sites which, if in excellent condition, in favorable years produce 1,200 lbs. of air dry forage (medium years-900 lbs./unfavorable years-700 lbs.). Sandy range sites, in excellent condition, can produce 1,500 lbs. (medium years-1,200 lbs. /unfavorable years-700 lbs.). Loamy range sites average 100 pounds less per year category.

The Great Divide Basin Shallow Sandy and Shallow Loamy range sites, in excellent condition, should both produce 450 lbs. air dry forage in favorable years (medium years-350 lbs. /unfavorable years 200 lbs.). Sandy and Loamy range sites in excellent condition should both produce 700 lbs. (medium years-500 lbs. /unfavorable years-300 lbs.).

The slopes of Green Mountain support Loamy and Coarse upland range sites. Loamy range sites, in excellent condition, should produce 2,000 lbs. of air dry forage in favorable years (medium years 1,500 lbs. /unfavorable years-800 lbs.). Coarse upland range sites should produce 1,700 lbs. (medium years-1,300 lbs. /unfavorable years-800 lbs.). Table 3-6 summarizes the current and potential vegetation production for the 7"-9" Green River and Great Divide Basins and the 10"-14" High Plains Southeast range site zones.

**Table 3-6. Current and Potential Vegetation Production
(Pounds of Production per Acre per Year by Range Site)**

7"-9" Green River & Great Divide Basins MLRA	Upland Sites			Meadow/Riparian Sites		
	Shrubs	Forbs	Grasses	Shrubs	Forbs	Grasses
Average Current Production	165	55	80	195	10	220
Potential Production ²	70-100	20-50	110-350	210-675	70-450	420-3,375
10"-14" High Plains Southeast MLRA	Upland Sites			Meadow/Riparian Sites		
	Shrubs	Forbs	Grasses	Shrubs	Forbs	Grasses
Average Current Production	265	50	175	70	410	1800
Potential Production ²	110-180	90-110	630-800	300-690	230-500	1,380-4,000

¹Average current production for the 10"-14" High Plains Southeast MLRA from the 1979-80 Green Mountain Weight Estimate Range Survey (Source: NRCS Ecological (Range) Site Descriptions)

²Production potential varies from site to site.

Table 3-7, Selected GMCA Ecological Sites, lists ten of the most important ecological sites within the allotment (See Appendix 20). They represent over 76 percent of the GMCA. The public land acres are derived from the East Fremont County Soil Survey and the Wyoming General Soils Map (Sweetwater County). Also, shown are the suggested stocking rates in surface acres per AUM for the high (good) seral and mid (fair) seral condition classes. These stocking rates are important in evaluating the proposed management actions for each alternative discussed in Chapter Two. The (10-14 SE) is the 10-14" High Plains Southeast Major Land Resource Area (MLRA) and (7-9 GR) is the 7"-9" Green River and Great Divide Basins MLRA.

Table 3-7. Selected GMCA Ecological Sites

Ecological Site Name (MLRA)	Total Public GMCA Acres	Total GMCA Percent	Acres/AUM High Seral (Good) Condition	Acres/AUM Mid Seral (Fair) Condition
Gravelly (10-14 SE)	25,150	5.37	8.3	20.0
Loamy (10-14 SE)	27,433	5.86	3.0	5.0
Loamy Overflow (10-14 SE)	27,875	5.95	2.0	4.0
Sandy (10-14 SE)	141,242	30.17	3.0	5.0
Shallow Loamy (10-14 SE)	37,738	8.06	5.9	10.0
Shallow Sandy (10-14 SE)	23,481	5.01	5.9	10.0
Subirrigated (10-14 SE)	41	0.01	0.67	0.40
Wetland (10-14 SE)	817	0.17	0.67	1.0
SUBTOTALS	283,777	60.60		
Loamy (7-9 GR)	43,202	9.23	5.9	10.0
Sandy (7-9 GR)	31,293	6.68	5.9	10.0
SUBTOTALS	74,495	15.91		
TOTALS	358,272	76.51		

The percentage of allotment production is shown in Table 3-8. The production figures were determined from weight estimate range surveys conducted in 1975-76 (See Appendix 15) for the former Seven Lakes Allotment

(approximately 40 percent of the GMCA) and 1979-80 (See Appendix 14) for the former Green Mountain Common Allotment (approximately 60 percent of the GMCA).

Table 3-8. Present Allotment Production

PRESENT TOTAL PRODUCTION OF VEGETATION (Pounds Air Dry)	PLANNING AREA/RANGE SURVEY
32,782,058	Green Mountain/1979-80 Survey
10,960,560	Seven Lakes/1975-76 Survey
43,742,618	TOTAL SUPPLY

The potential consumptive forage use for the GMCA is shown in Table 3-9. This table lists the necessary pounds of forage by grazing animal to support full grazing preference for cattle and sheep, the maximum appropriate management level (AML) for wild horses, and the current WGFD population objectives for big game.

The maximum consumptive forage use of forage by livestock, wild horses, and big game animals could result in overgrazing of 1,805 AUMs (-3 percent) in an allotment producing about 56,000 AUMs of forage within the approximately 522, 290 acres. This would occur if all the grazing permittees were allowed to make full use of their grazing preference.

Table 3-9. Potential Consumptive Use

FORAGE DEMAND (Pounds Air Dry)	AUMs	GRAZING ANIMAL
5,776,773	N/A	Wildlife (Big Game)
2,775,600	3,550	Wild Horses
8,588,250	11,451	Sheep
28,009,800	35,910	Cattle
45,150,423		Total Demand
-1,407,805	-1,805	Forage Deficit

Noxious Weeds

The BLM Lander Field Office annually contracts with the Fremont County Weed and Pest Control District for control (i.e., inventory, spraying, releasing insect vectors, and monitoring) of weeds on BLM-administered lands (See Appendix 3 for Descriptions and Specifications for Chemical Spraying and Release of Biological Control Agents). This is done as a cooperative effort with private landowners who are engaged in weed control programs on their own lands. Without these precautionary actions, untreated federal lands could serve as a seed source of weeds for invading private lands that have weed control programs.

The Fremont County portion of the allotment also lies within the Popo Agie Weed Management Area (PAWMA), the boundaries of which correspond to those of the Popo Agie Conservation District, which in this area is the county line. The PAWMA is a group of local, state, and federal agencies that work through a Memorandum of Understanding with the Fremont County Weed and Pest District to assist the landowners in the area with controlling noxious weeds.

Private companies also control weeds around facilities in keeping fire and work hazards down. Only properly licensed commercial applicators are allowed to apply pesticides on BLM-administered public lands. Appendix 3, section "Pesticide Use," describes the necessary procedures for private companies and affected interests to control weeds on BLM-administered public lands.

Wyoming state law (W.S. 11-5-101 through 11-5-119) requires landowners to control noxious weed infestations on

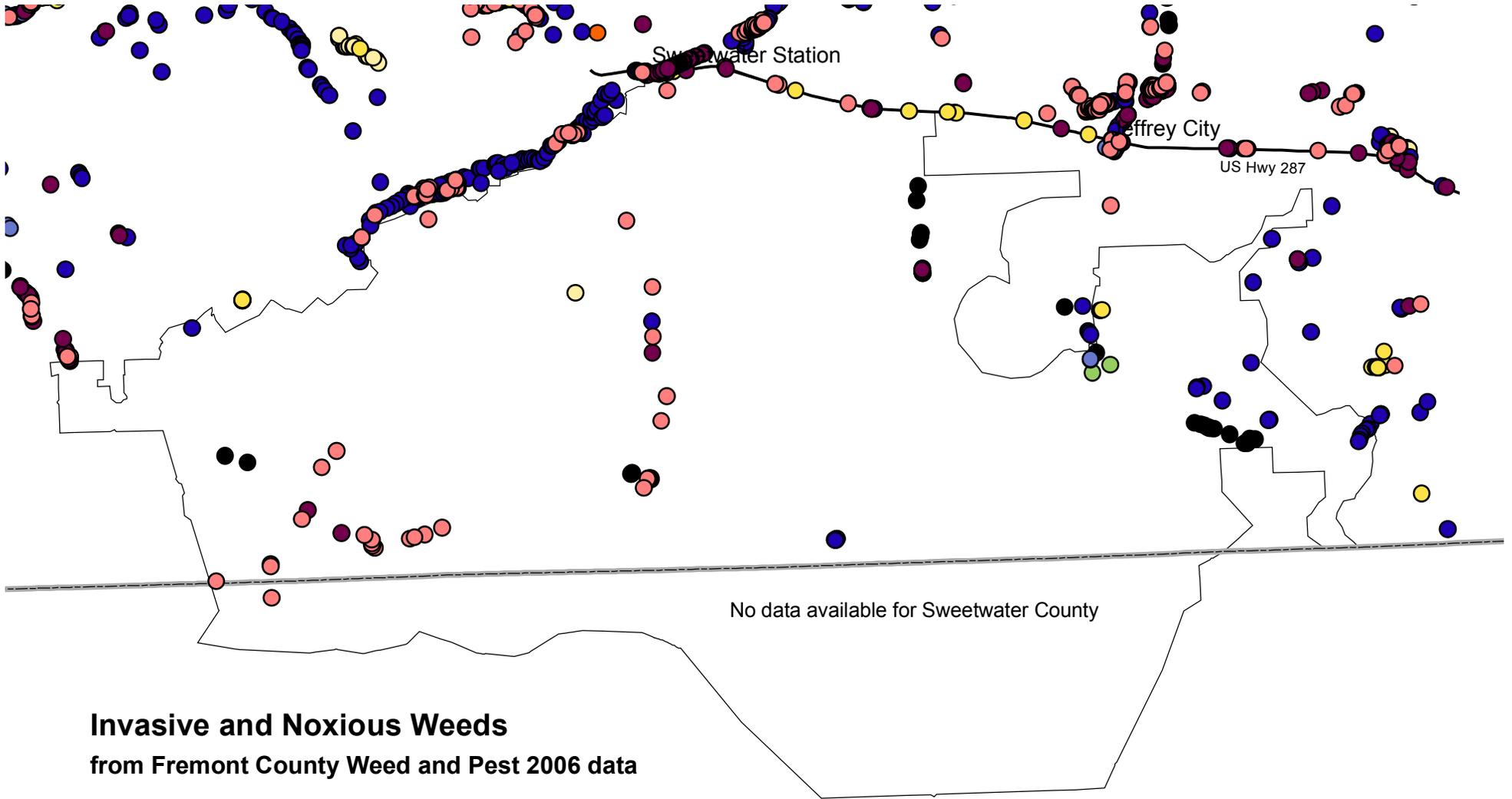
their property, or face penalties that can range from daily fines to quarantine of farm products coming off of noxious weed-infested land.

The following noxious weeds are present in or nearby the GMCA (see Map 3-2):

- **Russian knapweed (*Centaurea repens*)** occurs primarily in the western half of the allotment along the Bison Basin road, the far southwest portion of the allotment associated with the lakes, and along the Sweetwater River just outside the allotment. The U.S. Highway 287 right-of-way also has Russian knapweed within it.
- **Perennial pepperweed (*Lepidium latifolium*)**, or whitetop, occurs sporadically along the Sweetwater River outside the allotment.
- **Canada thistle (*Cirsium arvense*)** occurs sparsely along some roads and riparian areas.
- **Spotted knapweed (*Centaurea maculosa*)** occurs in the U.S. Highway 287 right-of-way, the Sweetwater River just southwest of Sweetwater Station, and some of the drainages and land rehabilitation projects on Green Mountain.
- **Leafy spurge (*Euphorbia esula*)** is found along Alkali Creek, just outside the allotment along the Sweetwater River at the far western reaches of the GMCA, and near Split Rock in both Fremont and Natrona Counties.
- **Diffuse knapweed (*Centaurea diffusa*)** is found in the Cooper Creek and Willow Creek drainages on the northeast slopes of Green Mountain.
- **Musk thistle (*Carduus nutans*)** is distributed along the U.S. Highway 287 right-of-way and on Crooks Creek, just inside the GMCA boundary.
- **Tamarisk (*Tamarix spp.*) or Saltcedar** has been treated near Sweetwater Station and occurs at Lost Creek Reservoir in the Great Divide Basin.
- **Hoary cress (*Cardaria draba* and *C. pubescens*)** is found along the Sweetwater River and U.S. Highway 287 right-of-way, and several roads in the central and western portions of the allotment.
- **Plumeless thistle (*Carduus acanthoides*)** has been found on well pads and roads on Green Mountain.
- **Russian olive (*Elaeagnus angustifolia*)** occurs outside the allotment along the Sweetwater River just north of Sweetwater Station, and also inside the allotment boundary along Crooks Creek.
- **Field bindweed** is found just outside the allotment near Sweetwater Station.
- **Quackgrass** occurs along the Sweetwater River just outside the northwestern boundary of the allotment.
- **Black henbane (*Hyoscyamus niger*)** is not a State of Wyoming-designated noxious weed, but it is a poisonous weed of concern associated with oilfield roads in the Happy Spring oilfield area, the Uranium mine road along the side of Green Mountain, and the Three Forks-Atlantic City Road. It is also found on disturbed ground and pipeline rights-of-way.

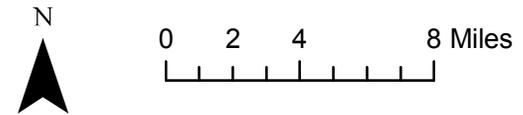
Though not designated as noxious by the state, weedy annuals like cheat grass (*Bromus tectorum*), halogeton (*Halogeton glomeratus*), and Russian thistle (*Salsola tragus*), and the biennial black henbane (*Hyoscyamus niger*), are quick to invade disturbed soils in the allotment, and can hinder rehabilitation efforts. Two of these weeds are poisonous, and only the cheatgrass is of very limited forage use for grazing animals.

Map 3-2: Invasive and Noxious Weeds



Invasive and Noxious Weeds from Fremont County Weed and Pest 2006 data

- | | |
|------------------|----------------|
| Russian knapweed | Field bindweed |
| Whitetop | Black henbane |
| Musk thistle | Russian olive |
| Spotted knapweed | Quackgrass |
| Canada thistle | Leafy spurge |
| Saltcedar | |



NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

WO IM 2006-073 Weed-Free Seed Use on Lands Administered by the BLM, which sets a limit of zero percent for noxious weed seed in seed purchased for use on bureau-administered lands.

All pesticide programs are carried out in accordance with federal and state regulations. Weed control in the Lander Field Office is consistent with the current EA for the Lander Resource Area for Noxious Weed Control (WY050-EA3-048), which is tiered to the Northwest Area Noxious Weed Control Program FEIS, 1985, its Supplement, 1986, and the Vegetation Treatment on BLM Lands in Thirteen Western States FEIS, 1991. It is also in conformance with the Lander RMP/Final EIS (RMP/FEIS) of 1986. On page nine of the Grazing Supplement to the RMP/FEIS is given a section on weed and pest control which presents the program. The RMP/FEIS's Record of Decision (ROD) also provides for livestock grazing and wildlife habitat maintenance and improvement actions (see page nine of the RMP's ROD).

The BLM has historically supported efforts of its own internal programs and those of our partners in local and state governments to establish weed-free forage states, areas, and counties. The 1996 BLM Partners against Weeds Action Plan states, on page 11, that BLM would, "develop and enforce policy designed to ensure seed, seed mixtures, hays, grains, and straws are free of weed seed".

The Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701-1712) requires BLM to manage public lands according to the principles of multiple use and sustained yield. These principles are further qualified in the Act by the Statutory Duty that BLM prevent unnecessary degradation of the public lands. The Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901 et seq.) requires the BLM to manage, maintain, and improve the public lands suitable for livestock grazing so that they become as productive as feasible. Several other federal laws authorize and direct weed control on federal lands: the Federal Noxious Weed Control Act of 1974-as amended 1990 (7 U.S.C. 2801-2813), as amended by Sec. 15, Management of Undesirable Plants on Federal Lands, 1990; and the Carson-Foley Act of 1968 (PL 90-583). Other authority is found in Executive Orders 11987, Exotic Organisms and 13112, Invasive Species; and Departmental Manual Parts 609 and 517. Of special note is Executive Order 13112 Invasive Species, in that it directs federal agencies, under Section 2, to:

... not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

Soon after the aforementioned Executive Order was released, BLM Washington Instruction Memorandum No. 1999-076, BLM Policy on the Use of Certified Weed-Free Hay, Straw, and Mulch on BLM Lands stated that "The BLM policy for States that do have certification programs in place (and Wyoming does) is to develop rules and regulations requiring the use of certified weed-free products on all public lands within that State".

Further, management priorities listed in the BLM Manual Section 9015, Integrated Weed Management, include the following on weed-free forage:

"Ensure that seed purchased and planted on BLM lands is free of noxious weed seeds and at least meets State seed standards. (Examples are forage, fire rehabilitation, browse, ground cover, tree seeds, mining disturbance, and oil and gas disturbance.) Where States have enacted legislation and have an active program to make weed-free forage available, ensure guidance restricting the transport of feed, hay, straw, or mulch which is not certified as weed-free."

As mentioned in the preceding paragraph, noxious weed-free seed is also required when reseeding BLM administered public lands. To this end, the bureau released a policy memo, W.O IM No. 2006-073, Weed-Free Seed Use on Lands Administered by the Bureau of Land Management in late January of 2006 which states "All [BLM] Field Offices are required to use seed on public lands that contain no noxious weed seed and meets certified seed quality". This IM details the standard allowable percentages for "other crop" and "secondary weed" seed.

Currently, BLM LFO Minerals and Recreation Programs-authorized activities are required to use noxious weed-free straw and hay for forage, storm water runoff control, and land rehabilitation uses.

The GMCA remains relatively free of noxious weed species. The few noxious weeds that do infest roads and trails on Green Mountain include the following: spotted knapweed, diffuse knapweed, and plumeless thistle. Also, black henbane is a poisonous plant that is spreading along roads and pipeline rights-of-way. These plant pests are being treated cooperatively by the Fremont County Weed and Pest district, as well as by several mineral development companies in the area.

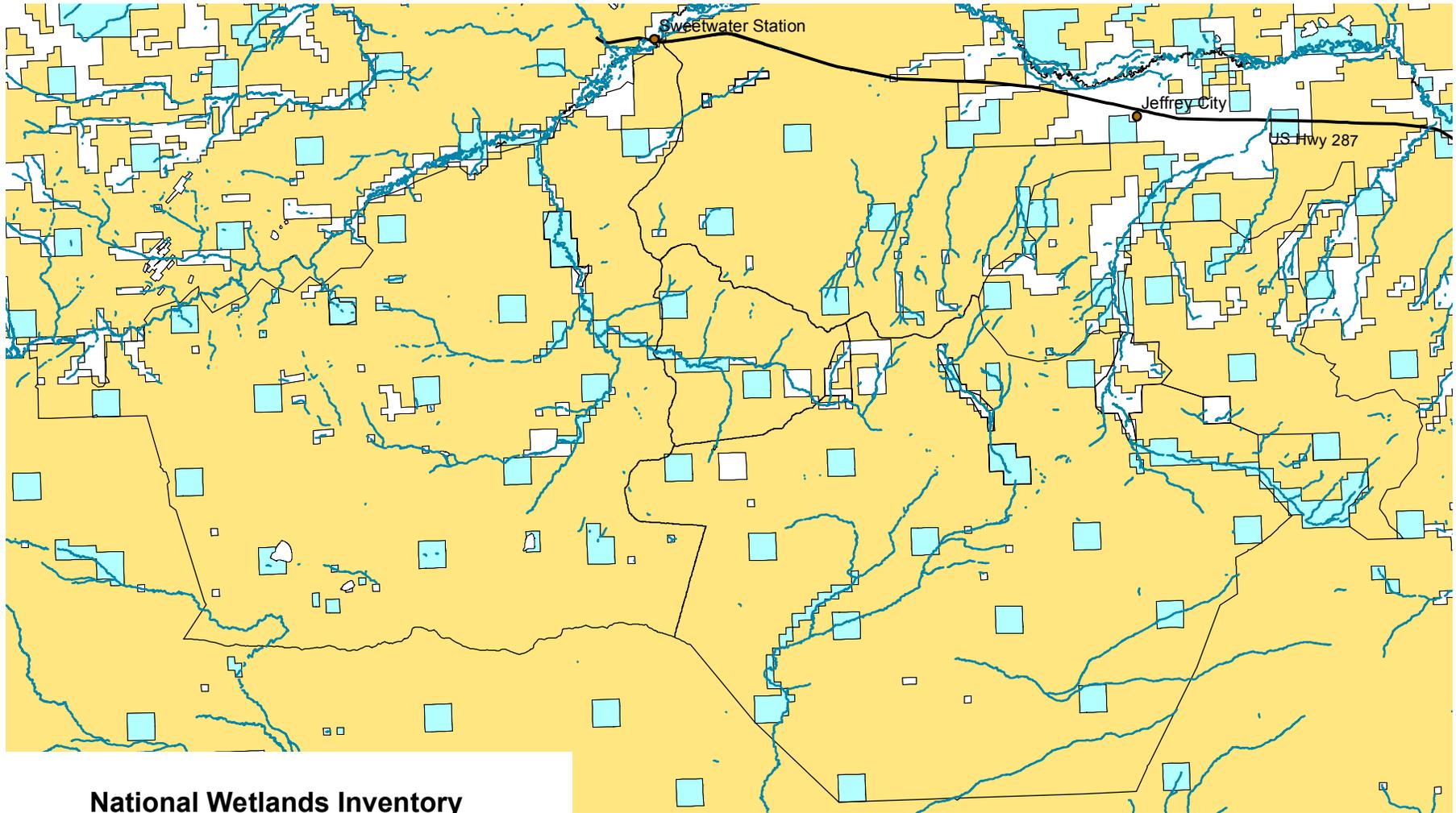
The Fremont County Weed and Pest District has established continuous survey, or inventory, of all lands in the county. Currently, it is planned that all parts of the county will be surveyed at least once every 10 years. This will yield valuable information on the effectiveness of various weed control strategies, weed spread, and invasion by new species.

Wetland-Riparian Vegetation

Wetland-riparian areas make up less than one-half of one percent of the vegetation types in the allotment, yet provide the greatest vegetative production per acre. These areas also receive the heaviest use by livestock, wild horses, and wildlife because of their high-quality forage and proximity to water. The GMCA's wetland-riparian vegetation can be divided into two basic subtypes. The first subtype generally consists of an overstory of cottonwood, willows, water birch, chokecherry, or aspen, with an understory of grasses, sedges, or rushes. The second basic subtype consists of wetland-riparian vegetation that lacks an overstory of trees or shrubs and consists mostly of rushes and sedges. A more complete description of plant species occurring in these riparian areas can be found in the Green Mountain Grazing EIS, Table 2-4.

In 1987, the U.S. Fish and Wildlife Service utilized aerial photo interpretation to complete a National Wetlands Inventory (NWI) for the allotment. This NWI method described ecological taxa, arranged them in a system useful to resource managers, furnished units for mapping, and provided uniformity of concepts and terms. Because wetlands are defined by plants, soils, and frequency of flooding, and were summarized by length and area in this inventory, three wetland habitat systems were identified in the GMCA; they are riverine (river-like), palustrine (marsh-like), and lacustrine (lake-like) habitats. This inventory also provided a breakdown of ownership of wetlands in the allotment when combined with Geographic Information Systems land ownership themes. Map 3-3 identifies the location of wetlands in the allotment. Table 3-10 depicts the ownership of public, state, and private wetlands within the allotment. See the Glossary for the definition of wetlands.

Map 3-3: Wetlands



National Wetlands Inventory

— Riparian areas

Surface Ownership

■ Bureau of Land Management

□ Private

■ State



0 2 4 8 Miles

NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

Table 3-10. GMCA National Wetlands Inventory (NWI)

LENGTH

Miles	Ownership	Percentage
47.23	BLM Admin. Public	62.56
14.82	Private	19.63
13.45	State	17.81
75.50	TOTAL	100.00

AREA

	Acres	Percentage
BLM Admin. Public	717.04	74.23
Private	119.65	12.39
State	129.21	13.38
Total	965.90	100.00

The BLM's PFC assessment of riparian habitats (1994 through 2001) on public lands within the allotment identified 90.8 miles of lotic riparian habitat and 1,564 acres of lentic riparian habitat. This assessment determined that 11.34 miles of lotic riparian habitat (12.5 percent) and 352 acres of lentic habitat (22.5 percent) were in proper functioning condition (please refer to the Glossary for definition of Lotic and Lentic). The remaining 79.42 miles (87.5 percent) of lotic riparian habitats and 1,212 acres of lentic riparian habitat (77.5 percent) were determined to be Non-Functional or Functional-at-Risk with a downward or unknown trend. Table 3-11 summarizes the amount of riparian acres and miles by assessment rating. Appendix 8 identifies the individual riparian areas and the acres and/or miles of habitat that are in PFC, Functional-at-Risk, or Non-Functional in the allotment. See the Glossary for the definition of riparian areas.

**Table 3-11. Proper Functioning Condition Assessment¹
Green Mountain Common Allotment**

	Proper Functioning Condition		Functional-at-Risk		Non-Functional	
	Total	Percent	Total	Percent	Total	Percent
Lentic Acres (Standing Water)	352.38	22.5	1018.86	65.1	193.03	12.4
Lotic Miles (Running Water)	11.34	12.5	55.77	61.4	23.65	26.1
Lotic Acres (Running Water)	42.58	8.1	448.68	85.1	36.13	6

¹Total Riparian Acres – 2092 (includes 90.8 miles of lotic habitat).

Grazing activities affect riparian habitats by altering, reducing, or removing vegetation, and by actually eliminating riparian habitats through channel widening, channel aggrading, or by lowering the water table (Platts 1991, Milchunas and Lauenroth 1993, Fleischner 1994). Current riparian habitats in the GMCA generally exist in a low seral stage. These riparian habitats are not only far from their potential extent, but are also shrinking in size as water tables drop and upland plant species encroach. Riparian habitats that have potential for woody shrubs, such as willow, have poor age class distribution or less than desirable species composition. Most of the lotic and lentic riparian habitats exhibit plants that have poor vigor as a result of season-long grazing. These habitats also exhibit impacted stream banks due to trampling and trailing by both livestock and wild horses.

LIVESTOCK GRAZING AND RANGELAND HEALTH STANDARDS

General

The GMCA has 16 livestock operators (see Appendix 5 for a list of the operators) who hold 19 grazing permits. Cattle and sheep are both grazed in the allotment, with a total grazing preference of 47,361 AUMs of which 11,451 are sheep AUMs. The season of use varies by operator, with use for cattle being from May 1 through December 31, and sheep from May 1 to November 30.

Utilization varies throughout the allotment with light to moderate use on the upland range and moderate to heavy use along the riparian zones. Numerous water developments have been constructed over the past ten years, however water continues to be needed to improve livestock distribution on the allotment and increase use of the upland range sites.

The GMCA was categorized in the Green Mountain Grazing EIS as a moderate priority Category I allotment. The following factors were used in the categorization of this allotment:

- Vegetative production is not satisfactory.
- Forage competition between grazing animals.
- Distribution of grazing animals is not satisfactory.
- Turnout dates are not consistent with range readiness.
- Conflicts with other land uses.
- Potential for positive economic return on public investments.

Rangeland Health Evaluation

The December 16, 2002 GMCA Evaluation documented several instances where BLM and the grazing permittees were not making significant progress toward meeting the 15 management goals and objectives described under

Chapter One of this document. In addition, the update of the conformance review for Standards for Healthy Rangelands showed that we were not meeting nor making significant progress toward meeting some of the standards, e.g. the standards for riparian areas and habitats for native species. The following discussion summarizes the major findings and conclusions from the update of the conformance review for Standards for Healthy Rangelands.

STANDARD ONE (Upland Soils)

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

Conclusions

To answer Standard One it is necessary to address this standard relative to:

- Riparian areas and their immediately adjacent uplands where the PFC inventory has recently documented conditions: Based on the above discussion under the Current Situation, the standard is not met.
- Evident degradation (i.e., accelerated erosion) of the roads and trails, primarily on Green Mountain, Crooks Mountain, and in the Crooks Gap: For the roads, trails, and similarly disturbed areas impacted by accelerated erosion, the standard is not met.
- Upland soil conditions over the rest of the allotment.

Can we expect to change plant species composition in the uplands in a reasonable time-frame? Has this site's ability to improve by non-mechanical/fire/ chemical methods been severely impaired or lost? Is this the kind of production and species mix that we will use for our desired plant community (DPC)? Has a lesser state of existence been achieved over the past century where we have a site that is able to sustain itself, but is significantly less productive as it could be if plant growth were optimal; if optimal is defined as excellent range condition or some other desired plant community?

The above questions must be answered to determine whether or not this standard is being met for the uplands in general. Such a general conclusion can only be reached by examining many specific sites and ascertaining the trend of erosion and vegetation since 1978. A statement expressing a great deal of certainty in regards to current conditions of the uplands is not possible. There are indications of past degradation and predicted trends of worsening erosion following the uncontrolled season-long grazing that has occurred since the Unit Resource Analysis (URA) was completed. Therefore, the conclusion for this largest portion of the uplands is unknown.

STANDARD TWO (Riparian and Wetland Vegetation)

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.

Conclusions

Prior to initiation of grazing management strategies to improve riparian habitat conditions during the summer of 1999, PFC assessments, frequency transects, willow transects, photographs, and professional observation indicated that riparian habitats were mostly in low seral stages and were not producing near their potential. Monitoring from 1999 to 2001 following initiation of grazing practices to improve riparian habitat conditions indicates that:

- Adequate regrowth of riparian vegetation to promote reproduction and improve vigor of desirable species did not occur following grazing,
- residual stubble height of riparian vegetation remains below adequate levels for soil stabilization and structure for species diversity (see Standard No. 4),
- bare ground is higher than expected in riparian areas, indicating below adequate levels of cover for soil stabilization,
- there are high amounts of litter to live vegetation in riparian areas, indicating heavy utilization of riparian vegetation inhibiting riparian recovery,
- there are high amounts of upland species occurring in riparian habitats, indicating drying of riparian habitats,
- vigor of young and mature willows remained poor throughout the period,

- canopy cover remained constant throughout the period, and
- willows density remained nearly constant throughout the period of 1997 to 2000; in 2001 willow density improved at the transects, apparently responding to the August/early September removal of livestock.

Based on the items identified above, Standard No. 2 is not being met, nor is there significant progress towards meeting the standard, because present management is not providing sufficient rest and recovery time. Even with the deferred rotation system, there has been essentially season long grazing on most riparian areas, resulting in heavy and severe utilization.

STANDARD THREE (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.

Conclusions

Do current upland rangeland resource conditions in the allotment meet the standard? Several partial answers to this question can be provided at this time. Given the landscape scale of the GMCA, there is an enormous variation in upland rangeland conditions. Based on the best available information, which is somewhat dated, the following general conclusions have been reached:

- The upland ecological (range) sites immediately adjacent to riparian areas are not meeting the standard. At the present time, this acreage has been estimated at 3-5 percent (15-25,000 acres) of the GMCA.
- Approximately 46 percent (239,000 acres) of the upland ecological (range) sites are probably meeting the standard.
- At the present time, the status of approximately 49-51 percent (253-263,000) of the upland ecological (range) sites is unknown.
- Upland erosion condition, vegetative cover, and desired plant community are three primary indicators that will be collected and developed. Allotment field inspections will be conducted and monitoring studies will be established, beginning in 2002, to complete the conformance determination.

STANDARD FOUR (Diverse Plant and Animal Habitat)

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.

Conclusions

Review of data and observations by resource specialists continue to indicate that critical public land acreage within the allotment does not support healthy and diverse riparian and upland plant communities as described under standards No. 2 and No. 3. These critical habitats provide for the highest diversity for both plants and animals. Woody riparian habitats such as cottonwood, aspen, willow, and water birch are not currently successfully reproducing themselves. Seedling and young age classes of these plant species are currently missing from the current habitats. This is reflected in less dense stands and stands that lack structural diversity. The reduction of density and structure (height) of these habitats is negatively impacting many species of non-game wildlife, such as neotropical migratory birds that are dependent on these habitats. Many riparian habitats are being reduced in size, due to the encroachment of upland plant species, loss of organic matter, reduced structure, and lowering of water tables.

These habitats provide the greatest bird and mammal diversity, due to the presence of water and structural diversity of vegetation. The deterioration of these habitats appears to be reducing non-game populations.

The high use levels in herbaceous riparian vegetation and upland herbaceous vegetation that results in reduced residual cover of herbaceous vegetation within one-half mile to one mile of water sources is also contributing to the current depressed (not robust) sage-grouse populations in the allotment. Sage-grouse are dependent upon herbaceous cover under and around individual sagebrush plants to hide their nests from predation. Sage-grouse late brood rearing habitat is also impacted by the poor condition of riparian habitats. This is also the case with nesting neotropical bird species.

The current habitats will support the federally threatened or endangered species that are known to occur in the allotment. The Wyoming Game and Fish Department (WGFD) have not indicated any other wildlife populations that are not self-sustaining. For big game species, the WGFD sets big game herd unit objectives at levels which

habitats can support and populations can maintain. Mule deer herds which utilize the allotment have been unable to reach or move toward population objectives since the winter of 1992-1993. Poor productivity of fawns, possibly as the result of poor habitat conditions may have resulted in these species from reaching population objectives. The poor habitat conditions are the result of drought that has generally occurred throughout the area for the past three years, along with a combination with heavy use by livestock of riparian habitats and adjacent upland habitats which are used by deer for fawning.

According to PFC inventory information and professional observations made in the allotment, Canada thistle is present on degraded wetlands and riparian areas. Canada thistle is a State of Wyoming designated noxious weed. A secondary noxious weed of concern locally is black henbane which is present along some of the roads.

STANDARD FIVE (Water Quality)

Water quality meets State standards.

Conclusions

Except for Crooks Creek, water resource conditions are rated as unknown. This is in keeping with BLM State of Wyoming guidance, as outlined in BLM Instruction Memorandum No. WY-98-061; until a monitoring list of streams has been assessed by the WDEQ, this standard is rated as unknown. We had several streams on WDEQ's monitoring list (W. Fork Cottonwood Creek, W. Fork Cottonwood Middle Creek, and Mormon Creek) that have had Beneficial Use Reconnaissance Project (BURP) monitoring completed, but they have not yet been fully assessed.

The only way to determine if this standard is being met is through monitoring suspected water bodies as they come to our attention. The priority monitoring list of streams has now been completed state-wide, and WDEQ will be able to investigate suspect water bodies; usually within five years of submittal (personal communication, Chuck Harnish, WYDEQ). BLM PFC inventory information is recognized as credible data to warrant further investigation with BURP monitoring. Those water bodies rated by the PFC inventory as Not Functioning, Functioning-at-Risk with a downward trend, or Functioning-at-Risk with an unknown trend, will be submitted in a letter to WDEQ by this summer.

Crooks Creek is the only GMC stream to appear on the 2002 draft list of waters with water quality impairments requiring a Total Maximum Daily Load (TMDL) allocation plan; the given cause of impairment is due to oil deposits. The TMDL for Crooks Creek will be a point source TMDL and deal with discharge issues at the Crooks Gap oilfield (personal communication with WDEQ's Jack Smith, 2001). As of now, until WDEQ completes assessments of water quality for the above mentioned streams, the water quality for streams in the GMCA is unknown.

STANDARD SIX (Air Quality)

Air quality meets State standards.

Conclusions

No known violations of state air quality standards have been documented for this area according to WDEQ's findings in the publication "Wyoming's Air Quality - Ambient Air Monitoring Data for 2000". Except for the city of Sheridan, all other areas in Wyoming where WDEQ has air monitoring stations are reporting levels below the applicable National Ambient Air Quality Standards. (See attached letter from WDEQ's Robert Schick, dated October 15, 2001.)

WILDLIFE/FISHERIES HABITAT AND SPECIAL STATUS SPECIES

Nongame Wildlife

Many species of nongame mammals, birds, reptiles, and amphibians are found throughout the GMCA, 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 allotment. This information is available in the Lander Field Office.

The abundance and species diversity of nongame wildlife is greatest in habitat types with high diversity in structure (height of vegetation) and species of vegetation. Such habitat types include wetland-riparian, aspen, limber pine, and mountain shrubland.

The presence of surface water notably contributes to habitat value. Wetland-riparian habitat types, which occupy less than one-half of one percent of the allotment, are of greatest importance for nongame wildlife. More species of breeding birds are found in riparian habitats than the more extensive surrounding uplands (Ohmart and Anderson 1986, Knoph et al. 1988, Saab and Groves 1992). Table 3-10 provides an estimate of total acreage of wetland habitat in the allotment from National Wetlands Inventory data. Map 3-3 identifies the locations of wetlands in the allotment.

Ground-nesting and shrub-nesting bird species are the most susceptible to disturbances created by livestock grazing (Saab 1996). Past season-long livestock and wild horse grazing has removed vegetation, altered vegetation structure in riparian habitats, and substantially reduced habitat suitability for many species in the allotment. Nongame wildlife abundance and species diversity is well below potential on most wetland-riparian habitat types in the allotment.

Game Birds

- **Sage-grouse** (see Special Status Species)
- **Blue grouse** are found in higher elevations of the GMCA. Areas characterized by woodland and mountain shrubland habitats are preferred on Crooks and Green Mountains are preferred. Blue grouse are dependent on the edges in these habitats. Herbaceous understory vegetation provides important nesting and brood-rearing cover. Past livestock and wild horse grazing and trampling of nesting and brood-rearing cover have adversely affected habitat conditions.
- **Waterfowl** populations within the GMCA vary greatly from year to year, depending on the availability of water in the allotment (precipitation-dependent). Wetland-riparian habitat provides nesting and brood-rearing areas for most waterfowl species occurring within the allotment on public land. Past livestock and wild horse grazing and trampling of wetland-riparian habitats have significantly reduced the suitability of these areas for waterfowl production.

Big Game

Elk

Portions of four WGFD elk herd units occur in the GMCA. Table 3-12 identifies the elk herd units occurring in the allotment, the WGFD population objective, the 2005 population estimate, the five-year population average, and forage demand in the allotment for each herd unit.

Elk habitat and seasonal ranges and acreages are shown on Map 3-4 and Table 3-13 for the allotment. The Shamrock Elk Herd Unit occurs in the southeastern portion of the allotment, but no occupied habitat occurs in this portion of the allotment. The Green Mountain Elk Herd Unit encompasses Green Mountain, Crooks Mountain, and the sagebrush/grass habitats around those mountains. The Steamboat Elk Herd Unit occurs in the western one-third of the allotment (west of the Bison Basin Road). Historically, approximately 30 elk traveled extensively throughout this area, generally centering near Cyclone Rim. The South Wind River Elk Herd Unit occurs only in a small portion on the allotment north of the Sweetwater River. In the past, approximately 50 elk inhabited this area in the Sweetwater River Canyon. During recent years, up to 400 elk have been observed in this portion of the allotment during the late fall, winter, and early spring. These elk are believed to be migrating from the Wind River Mountains to the west. Elk populations of the Green Mountain, Steamboat, and South Wind River herd units have exceeded population objectives for the past five years. For further discussions of elk habitat, movements, and food habitats, refer to the Affected Environment chapter of the Green Mountain Grazing EIS.

Mule Deer

Portions of four WGFD mule deer herd units occur in the GMCA. Table 3-12 identifies the mule deer herd units occurring in the allotment, the WGFD population objective, the 2005 population estimate, the five-year population average, and forage demand in the allotment for each herd unit.

Mule deer habitat and seasonal ranges and acreages are shown on Map 3-5 and Table 3-13 for the allotment. Habitats preferred by mule deer in the allotment include woody riparian, shrubland, juniper woodland, and aspen habitats. These habitats typically have adequate cover and extensive stands of browse species available. During

Table 3-12. Big Game Herd Units¹

HERD UNIT	WGFD HERD OBJECTIVE	5-YEAR HERD POPULATION ESTIMATE	5-YEAR HERD POPULATION AVERAGE	ANIMAL MONTHS NEEDED AT OBJECTIVE ²	POUNDS OF FORAGE
Beaver Rim Antelope (H.A. 65)	25,000	26,730	21,974	5,736	424,464
Red Desert Antelope (H.A. 60, 61, 64)	15,000	11,933	14,454	15,847	1,172,678
Sublette Antelope (H.A. 107)	48,000	47,900	43,340	0 ³	0
South Wind River Mule Deer (H.A. 95)	13,000	10,275	7,662	10,243	1,055,029
Chain Lakes Mule Deer (H.A. 98)	No occupied habitat occurs in allotment	-----	-----	-----	-----
Sweetwater Mule Deer (H.A. 96)	6,000	5,854	3,993	12,168	1,253,304
Steamboat Mule Deer (H.A. 131)	4,000	4,000	3,500	0 ⁴	0
Green Mountain Elk (H.A. 24)	500	1,400	1,373	2,865	1,071,510
Shamrock Elk (H.A. 118)	No occupied habitat occurs in allotment	-----	-----	-----	-----
Steamboat Elk (H.A. 100)	500	1,420	1,562	270	100,980
South Wind River Elk (H.A. 25)	3,300	4,063	3,742	See entry below	See entry below
South Wind River Elk or Steamboat Elk (South of Sweetwater River) ⁵	No objective	400	None	1,600	598,400

Footnotes for Table 3-12

1. The Lander RMP states that forage will be provided to meet the wildlife population objectives by herd units as outlined in the Wyoming Game and Fish Department Strategic Plan. The current herd objectives are identified in the following table. The GMCA makes up only a portion of all of these herd units for these big game species. Based on seasonal range acreages, historical wildlife use of the area, aerial monitoring and observations from WGFD and BLM biologists, the BLM determined the approximate wildlife use by species for the GMCA. Determining approximate wildlife numbers on a certain confined area is difficult at best, and these figures will continually be adjusted through the review process of this plan as better information and current habitat needs are identified.

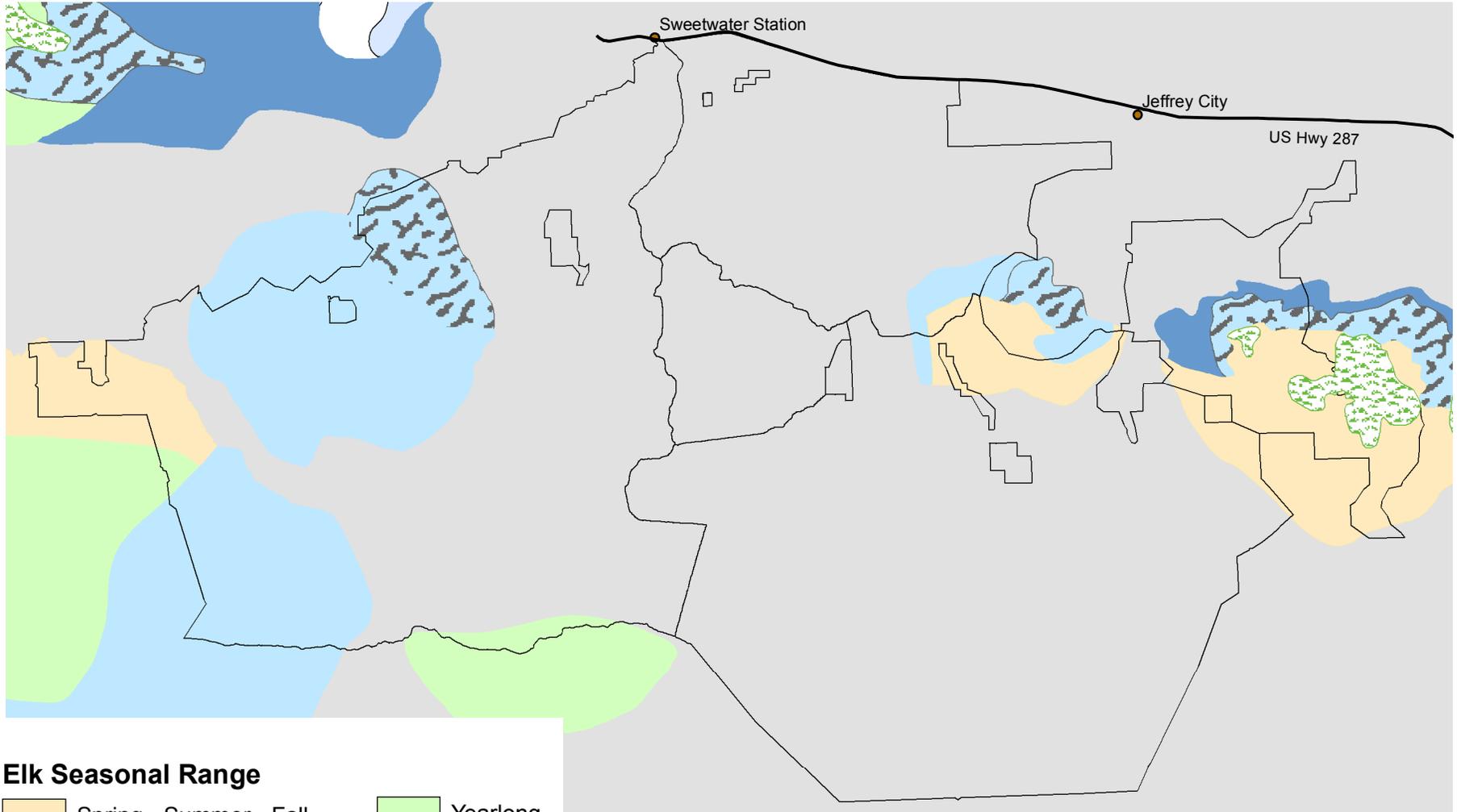
2. Animal months are based on the pounds of forage an individual of each species requires to sustain itself for one month: antelope-74, mule deer-103, elk-374, moose-652

3. Only 454 acres of this herd unit occurs within the GMCA.

4. Only 781 acres of this herd unit occur within the GMCA.

5. The area identified is located in the Antelope Hills. The Antelope Hills area of the GMCA is presently within the Steamboat elk herd area. Recently, larger numbers of elk have begun to use this area during the winter period. Biologists believe that these elk are from the South Wind River elk herd, and are changing their seasonal movements to an area where there is available forage and relatively isolated habitats away from human disturbance during the winter period. The South Wind River elk herd is presently over the objective of 3,300 animals. If elk continue to use this area over the next several years, changes in elk herd unit boundaries and seasonal habitats would be made.

Map 3-4: Elk Seasonal Range



Elk Seasonal Range

- | | |
|---|--|
|  Spring - Summer - Fall |  Yearlong |
|  Winter Yearlong |  Winter |
|  Severe Winter Relief |  Out |
|  Crucial Winter Yearlong |  Birthing |



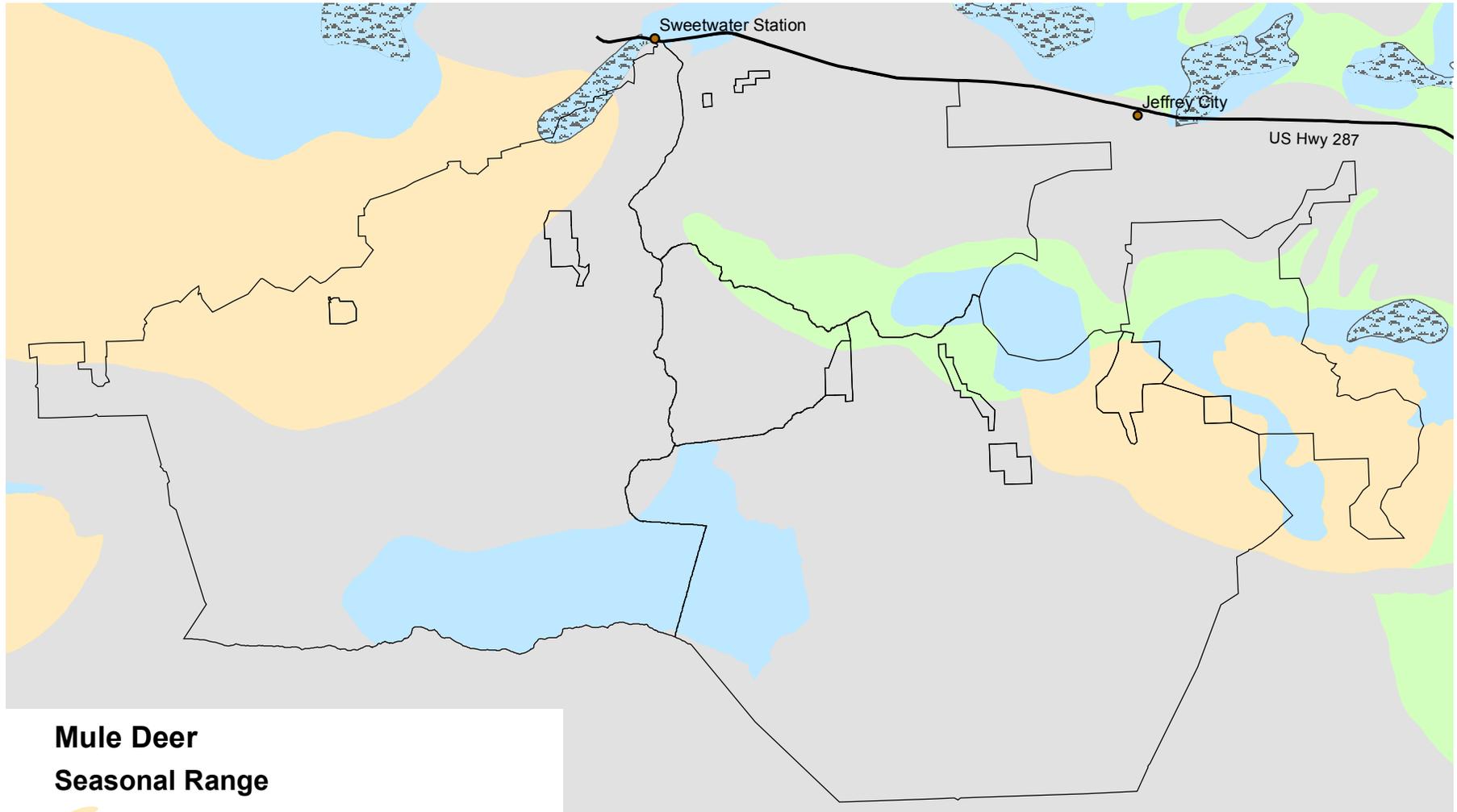
0 2 4 8 Miles

NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

Table 3-13. Big Game Seasonal Habitat Acreages (GMCA)

HERD NAME	CRUCIAL WINTER/ YEARLONG	WINTER	WINTER/ YEARLONG	SPRING/ SUMMER/ FALL	YEARLONG
Beaver Rim Antelope (H.A. 65)	15,006	0	42,491	45,477	0
Red Desert Antelope (H.A. 60, 61, 64)	0	0	20,790	382,185	0
Sublette Antelope (H.A. 107)	0	0	0	454	0
South Wind River Mule Deer (H.A. 95)	1,023	0	45,729	55,147	0
Chain Lakes Mule Deer (H.A. 98)	0	0	0	0	0
Sweetwater Mule Deer (H.A. 96)	0	0	15,615	37,741	28,026
Steamboat Mule Deer (H.A. 430)	0	0	781	0	0
Green Mountain Elk (H.A. 24)	2,930	3,796	1,910	29,651	0
Shamrock Elk (H.A. 118)	0	0	0	0	0
Steamboat Elk (H.A. 100)	0	9,652	19,843	60,786	0
South Wind River Elk (H.A. 25)	0	0	0	0	0
Lander Moose (H.A. 2,39)	523	0	128	37,887	0

Map 3-5: Mule Deer Seasonal Range



Mule Deer Seasonal Range

-  Spring - Summer - Fall
-  Winter Yearlong
-  Yearlong
-  Crucial Winter Yearlong
-  Out



0 2 4 8 Miles

NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

severe winters, deer are restricted to areas where cover and browse are still relatively accessible. On many deer winter ranges, riparian habitats provide the only available cover and most of the available forage. These riparian habitats also provide important forage and fawning areas during the spring and summer. Forage competition between livestock, wild horses, and elk in these riparian habitats has reduced the amount of forage available to deer. Mule deer population estimates for the Sweetwater, Steamboat, and South Wind River herd units have been below objective for a number of years. For further discussions on mule deer habitat, movements, and food habitats, refer to the Affected Environment chapter of the Green Mountain Grazing EIS.

Pronghorn Antelope

Portions of three WGFD pronghorn antelope herd units occur in the GMCA. Table 3-12 identifies the pronghorn antelope herd units occurring in the allotment, the WGFD population objective, the 2005 population estimate, the five-year population average, and forage demand in the allotment for each herd unit.

Pronghorn habitat and seasonal ranges and acreages are shown on Map 3-6 and Table 3-13 for the allotment. The Red Desert Pronghorn Herd Unit utilizes the largest proportion of the allotment during the spring, summer, and fall period. Pronghorn generally migrate south out of the allotment as a result of snow and colder temperatures. During most winters, a reduced number of antelope can be found along the southern boundary of the allotment from the Rocky Crossing Road to Eagles Nest Draw. The Beaver Rim Pronghorn Herd Unit occurs in the northern one-fourth of the allotment, which extends from the mouth of Alkali Creek along the Crooks Mountain divide to the area immediately southwest of Jeffrey City. Antelope movements in this herd unit are generally from south and west to northeast, with pronghorn wintering in the vicinity of Ice Slough and outside of the allotment to the east. A small portion of habitat of the Sublette Pronghorn Herd Unit (about 300 acres) occurs in the extreme western portion of the allotment, where pronghorn occur during the spring, summer, and fall. The five-year average estimated population for all herds is currently below population objectives, as a result of the cumulative impacts from long-term summer drought, which began in the late 1980s and persisted through the mid-1990s. The drought has dramatically reduced fawn survival, yearling recruitment, and, ultimately, herd size for these populations. The severe winter of 1992-93 also negatively impacted these populations. For further discussions of pronghorn habitat, movements, and food habitats, refer to the Affected Environment chapter of the Green Mountain Grazing EIS.

Moose

A portion of the Lander Moose Herd Unit occurs in the GMCA. Table 3-12 identifies the herd unit, the WGFD population objective, the 2005 population estimate, the five-year population average, and forage demand in the allotment for the herd unit.

Moose habitat and seasonal ranges and acreages are shown on Map 3-7 and Table 3-13 for the allotment. Moose habitat in the allotment generally occurs in forested or riparian habitats containing willow, cottonwood, or aspen species. Although moose occur in the allotment yearlong, the greatest numbers enter the allotment from the west as they migrate away from the Shoshone National Forest due to deep snow. Preferred forage for moose is willow, aspen, and other vegetative growth common to riparian habitats. Forage competition among other animals, including livestock, has adversely impacted the availability of forage and cover for moose. For further discussions of moose habitat, movements, and food habitats, refer to the Affected Environment chapter of the Green Mountain Grazing EIS.

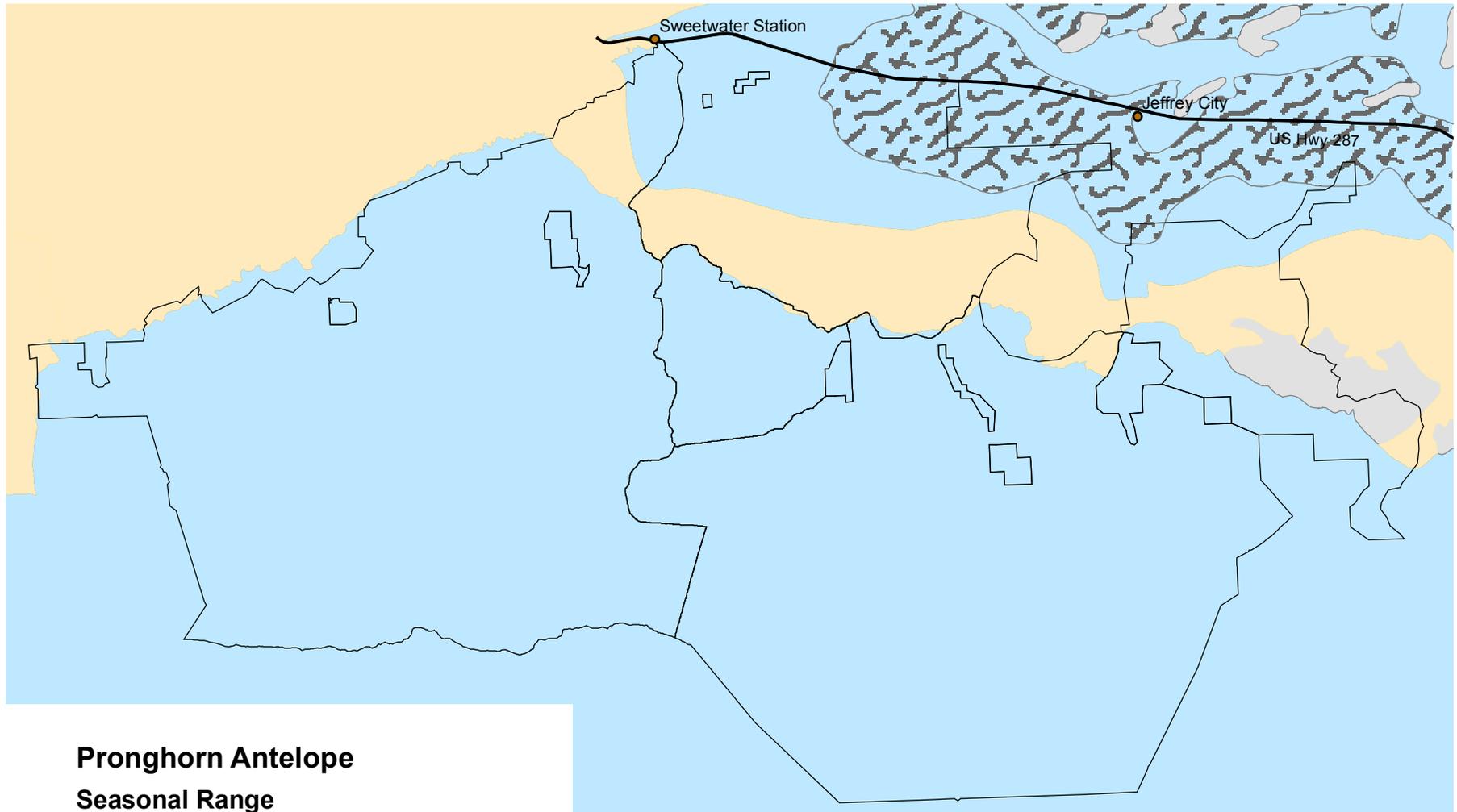
Fisheries

A variety of game and nongame fish species occur in the Sweetwater River and streams in the allotment. These include rainbow trout, cutthroat trout, brown trout, brook trout, white sucker, longnose sucker, mountain sucker, creek chub, lake chub, longnose dace, and fathead minnow.

The Sweetwater River and Crooks Creek are classified by the WGFD as Class 3 trout streams, which are identified as important fisheries on a regional basis within the State. The following streams are classified by the WGFD as Class 4 trout streams, which are important fisheries on a local basis: Sheep Creek, Cottonwood Creek (and tributaries), Willow Creek (near Green Mountain), Alkali Creek, Sulphur Creek, Mormon Creek, and Willow Creek.

Fisheries within the allotment have been affected by stream bank erosion, lack of woody shrub regeneration, and lack of herbaceous bank cover. Sediment adversely affects trout by silting in spawning gravel, smothering trout eggs after they are deposited, and filling in cracks between gravel and cobble where young trout overwinter. Eroded streambanks also offer little cover for trout. Reductions in willow and herbaceous cover along streams reduce water

Map 3-6: Pronghorn Antelope Seasonal Range



Pronghorn Antelope Seasonal Range

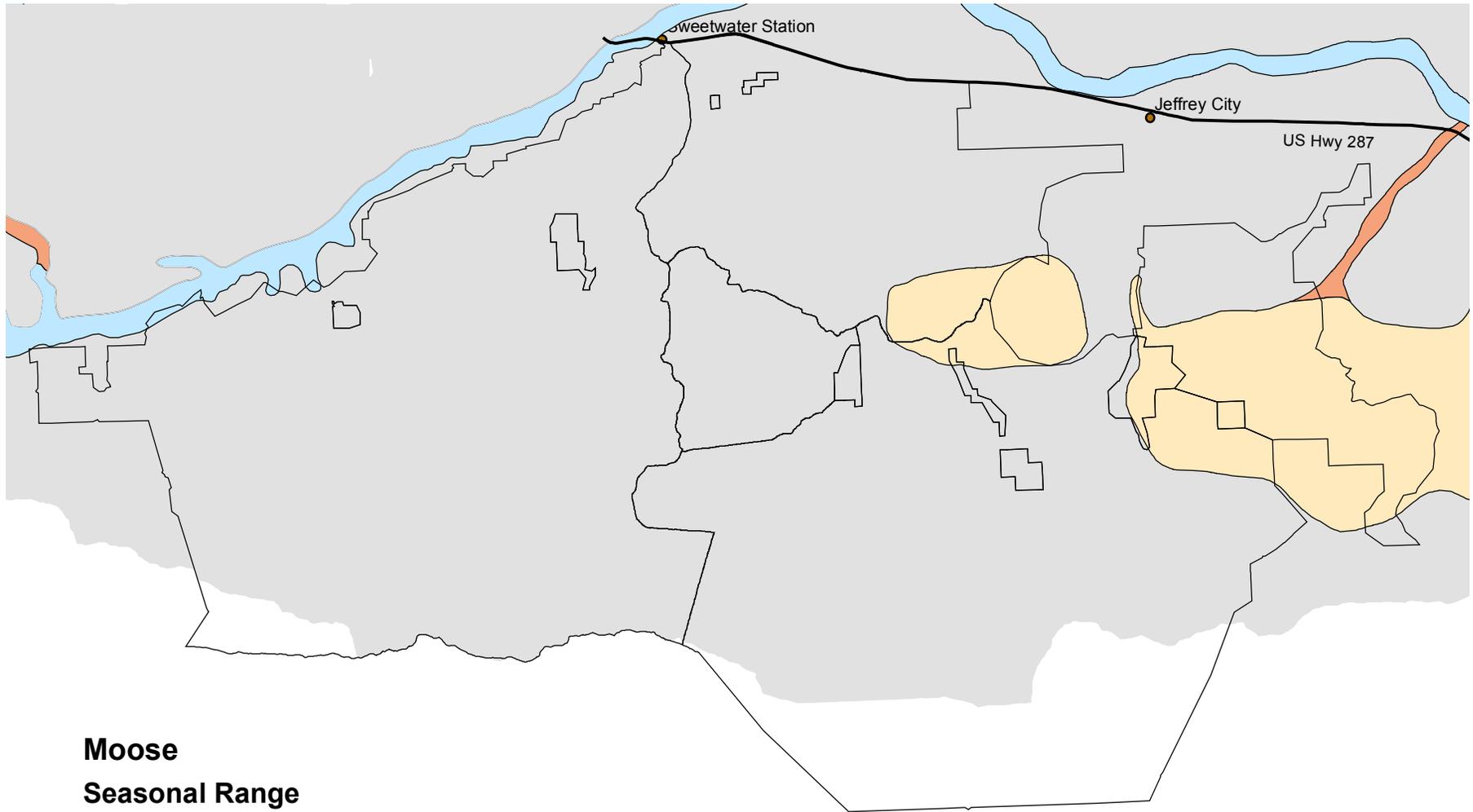
-  Spring-Summer-Fall
-  Winter Yearlong
-  Crucial Winter Yearlong
-  Out



0 2 4 8 Miles

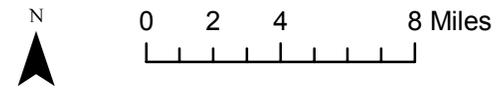
NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

Map 3-7: Moose Seasonal Range



Moose Seasonal Range

-  Spring - Summer - Fall
-  Winter Yearlong
-  Crucial Winter Yearlong
-  Out



NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

surface shading, which causes an increase in water temperature that adversely affects fish populations. Reduced shrub and herbaceous cover also minimize available cover for fish.

Special Status Species

Special status species include those plant and animal species that are 1) currently listed (or are candidates for listing) as threatened or endangered (T&E) under provisions of the Endangered Species Act (ESA), 2) designated as sensitive by the Wyoming BLM State Director, or 3) protected under the Migratory Bird Treaty Act. The Lander Field Office includes potential habitat for five T&E species and forty sensitive species (see Tables 3-14 and 3-15). This designation also includes consideration for Platte River water depletion that may affect listed species downstream, as well as critical habitat for the desert yellowhead plant (*Yermo xanthocephalus*).

Section 7 of the ESA requires that the BLM, as a federal agency, work to conserve any species listed as threatened or endangered. This is accomplished by consulting with the U.S. Fish and Wildlife Service (USFWS) concerning projects that might adversely affect such species, and by protecting such species or their habitat from harm. The BLM Manual 6840 (Policy and Guidance for Special Status Species Management) requires the BLM to conserve sensitive species and their habitats, so as to prevent them from becoming listed under the provisions of the ESA.

Threatened or Endangered Species

Table 3-14 lists the federally designated threatened and endangered species that are known to occur within the Lander Field Office, or for which potential habitat occurs within the LFO. There are currently no T&E candidate species considered within the LFO.

Table 3-14. Federally Listed Threatened or Endangered Species

Listed species Common Name	Scientific Name	Habitat
Canada lynx (T)	<i>Lynx Canadensis</i>	Cool, moist coniferous forests with cold, snowy winters and abundant snowshoe hares.
Black-footed ferret (E)	<i>Mustela nigripes</i>	Restricted entirely to extensive prairie dog colonies.
Ute ladies’-tresses (T)	<i>Spiranthes diluvialis</i>	Moist peat, sand, silt, or gravel soils near wet meadows, springs, lakes, ponds, or perennial streams.
Blowout penstemon (E)	<i>Penstemon haydenii</i>	Sparsely vegetated, early successional sand dunes and blowout depressions created by wind.
Desert yellowhead (T)	<i>Yermo xanthocephalus</i>	Barren slopes and ridges on outcrops of white, silty clay or Miocene sandstones of the Split Rock formation.
Critical habitat for desert yellowhead	<i>Yermo xanthocephalus</i>	A specific area within the Lander Field Office that has been designated as essential to the conservation of the desert yellowhead.
Platte River water depletion (T&E)	<i>Various species downstream of the Lander Field Office</i>	Riverine and wetland habitats used by various federally-listed species in the Platte River drainage downstream from the Lander Field Office.

- **Canada lynx** – Suitable habitat for the Canada lynx does not exist in the GMCA, and no part of the allotment is within a lynx analysis unit (LAU). This species will not be considered further in this document.
- **Black-footed ferret** – Most of the LFO (including the GMCA) has been block-cleared by the USFWS as being unsuitable for black-footed ferret reintroduction primarily because of a lack of extensive prairie dog colonies. The ferret will not be considered further in this document.
- **Ute ladies’-tresses** – This species has not been documented in the LFO. However, because suitable habitat does exist in the GMCA, it will be further considered in Chapter 4 of this document.
- **Blowout penstemon** – This species has not been documented in the LFO. However, because suitable

habitat does exist in the GMCA, it will be further considered in Chapter 4 of this document.

- **Desert yellowhead** – This species is known from a single occurrence several miles north of the GMCA. To date, numerous surveys have failed to identify additional populations in other locations with similar habitat. This species will not be considered further in this document.
- **Critical habitat for desert yellowhead** – Designated critical habitat for the desert yellowhead does not occur within the GMCA.
- **Platte River depletion** – Activities (i.e. water developments) that may deplete the Sweetwater River drainage and thereby reduce water availability to listed species downstream from the LFO will be considered in Chapter 4 of this document.

BLM Sensitive Species

Because the GMCA is so large and contains such a diversity of habitat types, most of the BLM State Sensitive Species can either be found or have the potential to occur on the allotment. Table 3-15 lists all those sensitive species for which suitable habitat exists within the LFO.

Table 3-15. Sensitive Species List (BLM)

MAMMALS		
Dwarf shrew	<i>Sorex nanus</i>	Mountain foothill shrub; grasslands
Long-eared Myotis	<i>Myotis evotis</i>	Conifer and deciduous forests; caves and mines
Spotted bat	<i>Euderma maculatum</i>	Cliffs over perennial water; basin-prairie shrub
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Forests; basin-prairie shrub; caves and mines
White-tailed prairie dog	<i>Cynomys leucurus</i>	Basin-prairie shrub; grasslands
Swift fox	<i>Vulpes velox</i>	Grasslands
Pygmy rabbit	<i>Brachylagus idahoensis</i>	Basin-prairie and riparian shrub
Grizzly bear	<i>Ursus arctos</i>	Conifer and deciduous forests
Gray wolf	<i>Canis lupus irremotus</i>	General habitats providing abundant ungulate prey, secluded denning and rendezvous sites, and relatively little human activity.
BIRDS		
Bald eagle	<i>Haliaeetus leucocephalus</i>	Lakes, rivers, and other water bodies suitable for foraging near large trees necessary for nesting and roosting
White-faced ibis	<i>Plegadis chihi</i>	Marshes and wet meadows
Mountain plover	<i>Charadrius montanus</i>	Short grass prairie/sparse vegetation
Trumpeter swan	<i>Cygnus buccinator</i>	Lakes, ponds, and rivers
Northern goshawk	<i>Accipiter</i>	Conifer and deciduous forests
Ferruginous hawk	<i>Buteo regalis</i>	Basin-prairie shrub; grasslands; rock outcrops
Peregrine falcon	<i>Falco peregrinus</i>	Tall cliffs
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Basin-prairie and mountain-foothill shrub
Long-billed curlew	<i>Numenius americanus</i>	Grasslands and plains; foothills; wet meadows
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Open woodlands; streamside willow and alder groves
Burrowing owl	<i>Athene cunicularia</i>	Grasslands; basin-prairie shrub
Sage thrasher	<i>Oreoscoptes montanus</i>	Basin-prairie and mountain-foothill shrub
Loggerhead shrike	<i>Lanius ludovicianus</i>	Basin-prairie and mountain-foothill shrub
Brewer's sparrow	<i>Spizella breweri</i>	Basin-prairie shrub
Sage sparrow	<i>Amphispiza billineata</i>	Basin-prairie and mountain-foothill shrub
Baird's sparrow	<i>Ammodramus bairdii</i>	Grasslands and weedy fields
FISH		
Yellowstone cutthroat	<i>Oncorhynchus clarki bouvieri</i>	Yellowstone drainage; small mountain streams; large rivers

AMPHIBIANS		
Northern leopard frog	<i>Rana pipiens</i>	Beaver ponds; permanent water in plains and foothills
Great Basin spadefoot	<i>Spea intermontana</i>	Spring seeps; permanent and temporary waters
Boreal toad (Northern Rocky Mtn. population)	<i>Bufo boreas boreas</i>	Pond margins; wet meadows; riparian areas
Spotted frog	<i>Ranus pretiosa (lutiventris)</i>	Ponds and sloughs; small streams
PLANTS		
Meadow pussytoes	<i>Antennaria arcuata</i>	Moist, hummucky meadows, seeps, or springs surrounded by sage/grasslands at 4,950 – 7,900 ft.
Porter’s sagebrush	<i>Artemisia porteri</i>	Sparsely vegetated badlands of ashly or tufaceous mudstone and clay slopes at 5,300 – 6,500 ft.
Dubois milkvetch	<i>Astragalus gilviflorus var. purpureus</i>	Barren shale, badlands, limestone and redbed slopes and ridges at 6,900 – 8,800 ft.
Nelson’s milkvetch	<i>Astragalus nelsonius</i>	Alkaline clay flats, shale bluffs and gullies, pebbly slopes, and volcanic cinders in sparsely-vegetated sagebrush, juniper, and cushion plant communities at 5,200 – 7,600 ft.
Cedar Rim thistle	<i>Cirsium aridum</i>	Barren, chalky hills, gravelly slopes and fine-textured, sandy-shaley draws at 6,700-7,200 ft.
Owl Creek miner’s candle	<i>Cryptantha subcapitata</i>	Sandy-gravelly slopes and desert ridges on sandstones of the Wind River formation at 4,700 – 6,000 ft.
Fremont bladderpod	<i>Lesquerella fremontii</i>	Rocky, limestone slopes and ridges at 7,000 – 9,000 ft.
Beaver Rim phlox	<i>Phlox pungens</i>	Sparsely vegetated slopes on sandstone, siltstone, or limestone substrates at 6,000 – 7,400 ft.
Rocky Mountain twinpod Persistent sepal yellowcress	<i>Physaria saximontana var. saximontana</i>	Sparsely vegetated, rocky slopes of limestone, sandstone, or clay at 5,6000 – 8,300 ft
Persistent sepal yellowcress	<i>Rorippa calycina</i>	Riverbanks and shorelines, usually on sandy soils near high water line
Shoshonea	<i>Shoshonea pulvinata</i>	Shallow, stony, calcareous soils of exposed limestone outcrops, ridgetops, and talus slopes at 5,900 – 9,200 ft.
Barneby’s clover	<i>Trifolium barnebyi</i>	Ledges, crevices, and seams on reddish-cream Nugget sandstone outcrops at 5,600 – 6,700 ft.

- **Dwarf shrew** – This tiny, secretive mammal is known from a relative few specimens throughout Wyoming. Although no occurrence has been documented in the GMCA, this species has been found in nearby Sweetwater County. It is known to use a wide variety of habitats and likely occurs within the

allotment.

- **Long-eared myotis bat** – This species is known to primarily inhabit coniferous forests and woodlands, and is also known to forage above water in these environments. Although not documented in the GMCA, suitable habitat exists on Green and Crooks Mountains.
- **Spotted bat** – Although its range includes much of the GMCA, this species is known to roost in cliff crevices near perennial water, a habitat type that is rare in the allotment.
- **Townsend's big-eared bat** – Unlike the long-eared myotis and spotted bats which may roost in tree snags and use parts of the GMCA seasonally, the Townsend's big-eared bat requires caves or mine shafts throughout its life cycle (Gruver and Keinath, 2003). No natural caves are known to occur in the GMCA, and all remaining mine portals have been sealed. This species is unlikely to occur in the GMCA and will not be considered as part of the affected environment.
- **White-tailed prairie dog** – This species occurs throughout the GMCA in shrubsteppe/grassland habitats. These occurrences vary in size from individual burrows to colonies that may cover several acres.

Once abundant across Wyoming, the white-tailed prairie dog has long been considered a pest by the agricultural industry, and its numbers have been reduced by poisoning, recreational shooting, destruction of habitat, and disease (Keinath, 2004). Because of continued persecution and declining populations, the USFWS was petitioned as recently as 2002 to list the species as threatened under the provisions of the ESA.

- **Swift fox** – This species has historically occupied short or mixed grass prairies on level to moderately rolling terrain in the Great Plains. The WGFD reports that recent studies and anecdotal information suggests that the swift fox is capable of inhabiting, surviving, and reproducing in sagebrush/grassland habitats. Populations of swift fox are probably low in the allotment; however, undocumented sightings in the allotment and in nearby allotments have been reported.
- **Pygmy rabbit** – This smallest of all North American rabbit species inhabits tall, dense sagebrush and has been documented at several locations across the GMCA.
- **Grizzly bear** – Although this large omnivore is highly adaptable to a variety of habitats and food sources, it generally requires extensive forested habitat that is relatively undisturbed by human activity. Such forested habitat in the GMCA would only occur on Green or Crooks Mountains, and these areas have extensive road systems that are used throughout much of the year by recreationists, livestock operators, and energy development workers. Therefore, suitable habitat for the grizzly bear is unavailable in the GMCA, and this species will not be considered in the affected environment.
- **Gray wolf** – This species was recently removed from the T&E list and currently has dual status in Wyoming (both as a trophy game animal and as a predator) depending upon the location of occurrence. This species is designated as a predator in the GMCA and is not likely to ever become established there. Consequently, it will not be considered further in Chapter 4 of this document.
- **Bald eagle** – Recently removed from the T&E list, this species requires relatively large water bodies (i.e. large rivers, lakes, etc.) for foraging near large trees, for nesting, and for roosting. Such habitat is unavailable in the GMCA. Consequently, this species will not be considered further in this analysis.
- **White-faced ibis** – This species requires large lakes or wetland areas in which to breed, and large quantities of emergent vegetation on which forage (Dark-Smilely and Keinath, 2003). This type of habitat does not exist within the GMCA. Consequently, this species will not be considered in the affected environment.
- **Mountain plover** – This species is known to breed and raise young in the allotment during the spring,

summer, and early fall. Plovers are generally found in habitats that have little or no vegetation structure such as grasslands, alkali flats, or low shrubs (i.e., saltbush). Plovers may nest on sites where vegetation is sparse to bare or closely-cropped.

- **Trumpeter swan** – Although this species may occasionally stopover at Picket or Scotty Lakes in the southwestern part of the GMCA, they require relatively large water bodies (over 100 meters across) with shallow margins and aquatic vegetation for breeding habitat (Travsky & Beauvais, 2004). This type of habitat does not exist within the GMCA. Consequently, this species will not be considered in the affected environment.
- **Northern goshawk** – The typical habitat for this species is a mixture of conifer and deciduous woodlands (i.e. lodgepole pine and aspen). Such habitat is readily available within the GMCA on Green and Crooks Mountains.
- **Ferruginous hawk** – This species requires open, shrubsteppe, and grassland habitats which are available throughout most of the GMCA. It has been documented foraging and nesting in numerous locations within the allotment.
- **Peregrine falcon** – There are currently no known nesting sites by this species in the GMCA. However, a limited amount of suitable habitat may occur within the allotment.
- **Greater sage-grouse** – It is arguable that this is the species of greatest concern in the Lander Field Office at the present time because of repeated efforts to have it federally listed. These birds are solely dependent upon sagebrush for food and cover from October to April. Map 2-6 shows important known wintering areas within the allotment. Courtship occurs on strutting grounds from March to May. Recent studies have shown that about two-thirds of the hens will nest within three miles of the lek at which they mated, and the remainder will nest within 15 miles (WY Sage-grouse Conservation Plan, 2003). Thirty-seven known strutting/nesting complexes occur within the allotment or overlapping portions of the allotment. Map 2-5 shows the locations of these strutting/nesting complexes. From June through September, sage-grouse are usually found near wetland-riparian habitats, where succulent forage, water, and insect food are normally available. The general trend of sage-grouse populations within the allotment is downward over the past 20 years. This downward trend is thought to be caused by drought, past livestock grazing practices, predation, and habitat fragmentation from energy development, utilities construction, etc. Livestock grazing has impacted sage-grouse in the allotment by the removal of herbaceous plants (grasses and forbs) that occur around the base of sagebrush plants. The removal of these plants permits predators to prey upon sage-grouse eggs by reducing the hiding cover around the nest. Livestock grazing practices have also impacted sage-grouse by reducing habitat quality in riparian habitats used for brood rearing. Continual livestock grazing during the growing season has caused nearly all riparian habitats in the allotment to be in a low seral stage. These low seral riparian vegetation stages do not support the vegetative cover to hide sage-grouse from predators or to provide insect populations required for raising sage-grouse chicks. Energy exploration and development within the GMCA further impacts sage-grouse habitat through direct loss to road and well pad construction and fragmentation by roads, pipelines, and utilities. Further discussion on sage grouse life history and habitat needs can be found in Appendix 9.
- **Long-billed curlew** – Suitable habitat, though not plentiful in the GMCA, does exist, especially in the vicinity of Scotty and McKay Lakes.
- **Yellow-billed cuckoo** – In Wyoming, this species is generally found along relatively large watercourses (i.e. Bighorn, Powder, North Platte, etc.) in dense, closed canopy stands of cottonwood and willow (Bennett & Keinath, 2003). Such habitat is non-existent the GMCA. This species will not be considered in the affected environment.
- **Burrowing owl** – This small owl species requires readily available burrows (typically prairie dog) for nesting, roosting, and cover. This type of habitat is available throughout much of the allotment.

- **Sage thrasher, Brewer's sparrow, and sage sparrow** – These species are all considered sagebrush obligates whose habitat could be impacted by livestock grazing practices. Suitable habitat occurs throughout the allotment.
- **Loggerhead shrike** – Although this species occurs throughout North America, in Wyoming it is generally associated with dense patches of sagebrush - which it uses for nesting - intermixed with open, grassy areas for foraging. Such habitat is found throughout much of the GMCA.
- **Baird's sparrow** – This species generally prefers open grasslands and overgrown fields with taller, denser grasses (Luce and Keinath, 2003). This habitat type is not plentiful in the GMCA, but it may exist in some areas such as sloughs or riparian pastures.
- **Yellowstone cutthroat trout** – This species is endemic to the Yellowstone River drainage. Since no part of the GMCA is located in that drainage, it will not be considered in the affected environment.
- **Northern leopard frog, Great Basin spadefoot, boreal toad, and spotted frog** – These amphibian species generally require some type of riparian habitat (ponds, wet meadows, seeps, etc.) to complete their life cycle. Habitat of this type is found throughout the GMCA and is often heavily impacted from grazing by livestock and wild horses.
- **Meadow pussytoes** - This plant species occurs in riparian habitats in the western portion of the allotment in the Antelope Hills/Picket Lake Use Area. Meadow pussytoes is found at or near the top of hummocks, and also in locations that receive higher solar radiation in riparian areas that are in low to mid-seral stages. These locations provide a micro-habitat that appears to permit the plant to out-compete other riparian plant species that require slightly moister sites. These micro-sites also provide for increased solar radiation that appears to be required for meadow pussytoes. These hummocks have been produced by trampling of livestock, wild horses, and, to a lesser extent, by wildlife.
- **Porter's sagebrush** – Although not documented in the GMCA, the Wyoming Natural Diversity Database (WYNDD) computer model indicates that suitable habitat may exist for this species within the allotment.
- **Dubois milkvetch** – This plant species is endemic only to badland habitat found near Dubois, Wyoming (Ladyman, 2004). It has never been documented in the GMCA, and therefore will not be considered as part of the affected environment.
- **Nelson's milkvetch** – Although not documented in the GMCA, the WYNDD model indicates that suitable habitat may exist for this species within the allotment.
- **Cedar Rim thistle** – Although not specifically documented in the GMCA, the WYNDD model indicates that suitable habitat may exist for this species within the allotment.
- **Owl Creek miner's candle** – This species is known only from the Owl Creek and Bridger Mountains (Fertig, 2000), and suitable habitat is not shown to exist by the WYNDD model within the GMCA. It will not be considered as part of the affected environment.
- **Fremont's bladderpod** – The LFO has no documentation of occurrence by this species in the GMCA. However, the WYNDD model indicates that suitable habitat may occur in the allotment.
- **Beaver Rim phlox** – This species is typically known from several locations north of the GMCA, but is not actually documented on the allotment. However, the WYNDD computer model indicates the likelihood of suitable habitat.
- **Rocky Mountain twinpod** – Also known from occurrences in the Beaver Rim area north of the GMCA, this species has not been documented by the LFO on the allotment. However, the WYNDD computer

model indicates the likelihood of suitable habitat.

- **Persistent sepal yellowcress** – This species requires the moist soils that would be found around the banks of streams, stock watering ponds, etc. Although not documented within the GMCA, habitat of this type certainly does exist there in numerous places.
- **Shoshonea** – According to LFO occurrence records, this species has only been documented in the Owl Creek Mountains in this field office. However, the WYNDD computer model does indicate a small amount of suitable habitat in the GMCA.
- **Barneby's clover** – This species is considered endemic only to Nugget sandstone outcrops of the southeast Wind River Mountains (Fertig, 2000). The WYNDD computer model does not indicate any likelihood of suitable habitat in the GMCA. Consequently, it will not be considered in the affected environment.

Having eliminated those species for which no suitable habitat exists in the GMCA, the following Special Status Species (as seen in Table 3-16) will be considered further in Chapter Four, Environmental Consequences analysis:

Table 3-16. Special Status Species in the Affected Environment

<i>Species</i>	<i>Status</i>
<i>Ute ladies' tresses</i>	Threatened
<i>Blowout penstemon</i>	Endangered
<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>Swift fox</i>	BLM Sensitive
<i>Pygmy rabbit</i>	BLM Sensitive
<i>Mountain plover</i>	BLM Sensitive
<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
<i>Long-billed curlew</i>	BLM Sensitive
<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>Baird's 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>Meadow pussytoes</i>	BLM Sensitive
<i>Porter's sagebrush</i>	BLM Sensitive
<i>Nelson's milkvetch</i>	BLM Sensitive
<i>Cedar Rim thistle</i>	BLM Sensitive
<i>Fremont bladderpod</i>	BLM Sensitive
<i>Beaver Rim phlox</i>	BLM Sensitive
<i>Rocky Mountain twinpod</i>	BLM Sensitive
<i>Persistent sepal yellowcress</i>	BLM Sensitive
<i>Shoshonea</i>	BLM Sensitive

WILD HORSES

General Information

An estimated 250 wild, free-roaming horses inhabit the GMCA in three different herd management areas (HMAs) (see Map 3-8). The following table shows current wild horse inventory information and Appropriate Management Levels (AML) for the allotment by HMA.

Table 3-17. GMCA Wild Horse Inventory and AML by Herd Management Areas

HMA	Current Number of Horses	AML
Green Mountain	100*	170-300
Crooks Mountain	85*	65-100
Antelope Hills/Cyclone Rim	65	65-82

* These numbers represent a portion of the AML found within the GMCA under normal environmental conditions. At any given time this number may be more or less.

These animals breed in the summer and fall. Their numbers increase by about 15-20 percent annually. Recent drought conditions have allowed almost year-round breeding, with colts being observed in almost every month of the year.

The horses appear to be in excellent health. Injured, sick, or emaciated wild horses are rarely seen. Because the GMCA is relatively remote and unvisited, the wild horses can generally be viewed in a very natural setting. The horses are not greatly alarmed by visitors and can usually be approached to within a few hundred yards.

Habitat

Crucial winter habitat exists in the Green Mountain HMA in the vicinity of Crooks Creek, east of Whiskey Peak, and North of the Green Mountain. Crucial winter habitat exists in the Crooks Mountain HMA in the vicinity of Ice Slough, and also in the Antelope Hills HMA in the vicinity of Picket Lake. Also, a summer concentration area has been identified in the Soap Holes vicinity of the Crooks Mountain HMA. The areas of horse use are somewhat dependent upon water availability, although it is not uncommon to see wild horses more than five miles from water. Most movement to and from water occurs in the early mornings and late evenings. In late summer when water supplies are limited, herd movements are also limited. The bands prefer to feed on upland areas that provide a good field of vision for escape. In the winter, the horses are often found in groups of two to five horses on exposed ridges which are blown free of snow.

Distribution and Movement

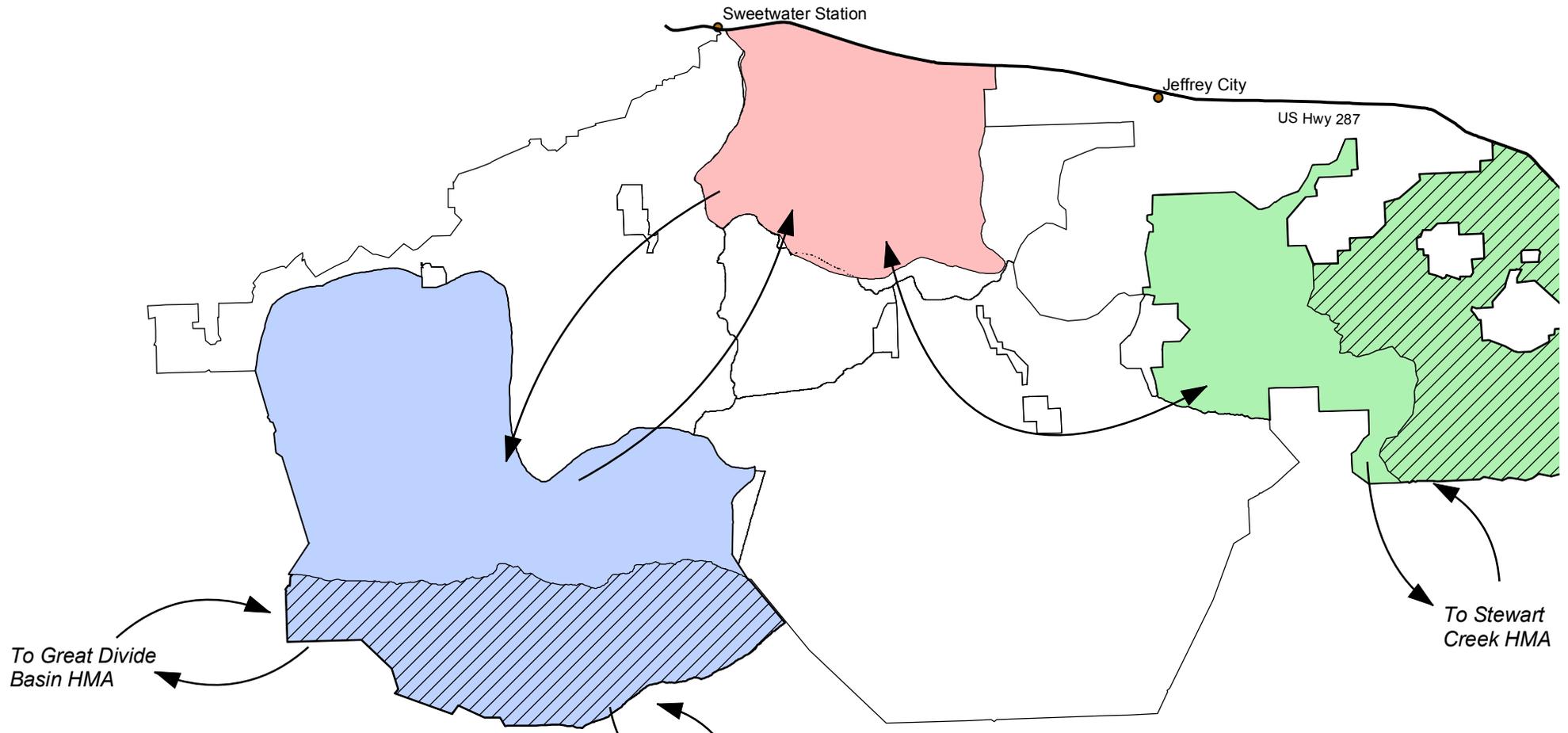
Because of the open spaces in the GMCA, the wild horses are indeed free-roaming. They are scattered throughout the HMAs within the allotment and use public, state, and private lands in the HMAs. Movement within the general distribution areas is normally confined to a seven- to ten-square mile area in which animals forage and water.

The horses move between HMAs, and can therefore be found in the travel zones between those HMAs. Horses from the Green Mountain HMA mix with horses from the Crooks Mountain and Stewart Creek HMAs. Horses from the Crooks Mountain HMA mix with the horses from the Green Mountain, Stewart Creek Antelope Hills/Cyclone Rim, and Lost Creek HMAs. Horses from the Antelope Hills/Cyclone Rim HMA mix with horses from the Crooks Mountain, Lost Creek, and Great Divide Basin HMAs. This movement provides for continued genetic health within the herd management areas by way of gene exchange among other herds.

Viewing and Visitor Days

It is estimated that the viewing of wild horses and the estimated visitor days of this specific activity has increased in recent years. In the BLM Rock Springs Office, the White Mountain HMA has an advertised wild horse scenic loop of 25 miles, beginning north of Rock Springs and ending at Interstate 80 on the outskirts of the city of Green River. Visitor use days for this marketed and advertised loop for the last three years (2005, 2006, and 2007) have averaged 32,800 visitor days. The three HMAs within the Green Mountain Common Allotment are not advertised and marketed as wild horse scenic routes. They are not located near an interstate highway; however, they are on a major route to Yellowstone National Park. Based on field contacts, office inquiries, and a number of telephone conversations, it is estimated that these three HMAs combined receive about 1/100th of the visits received at the White Mountain HMA. This would be about 492 visitor days per year over the same period. It can also be assumed that the growth potential for any one of the HMAs within the GMCA would be the same as the White Mountain

Map 3-8: Wild Horse Herd Management Areas



WILD HORSE HERD MANAGEMENT AREAS

-  ANTELOPE HILLS: 60-82 AML
-  CROOKS MOUNTAIN: 65-100 AML
-  GREEN MOUNTAIN: 170-300 AML
-  HERD AREA OUTSIDE GREEN MOUNTAIN COMMON
-  INTERCHANGE TRAVEL ZONES



0 2 4 6 8 Miles

NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

HMA, were the herd areas within the GMCA marketed and advertised by the BLM.

Herd Genetics

The horses in the Green Mountain and Crooks Mountain HMAs display mixed-breed genetics and characters, with genetic markers that are genetically tied to several different breeds. The Antelope Hills/Cyclone Rim HMA has genetic markers that would reflect a similarity for the New World Spanish horse breeds. The genetic similarity to this group is relatively high for a mustang herd. In conclusion, the data support a strong Spanish heritage for this herd, but there is likely some other blood type within the group. The Antelope Hills portion of the herd shows a number of markers that are suggestive of Spanish blood; however, the overall similarity remains greater with the North American breeds, while the Spanish breed similarity is relatively moderate. Although one cannot rule out Spanish heritage, it does not appear to be the main component of this herd.

CULTURAL RESOURCES

Prehistoric

The GMCA lies on the fringes of the Northwestern Plains Culture Area (Frison 1991) and the western Wyoming Basin Culture Area (Metcalf 1987). Although not much archeological work has been done in the GMCA, it appears that Metcalf's cultural sequence is more suited to this area.

In general, prehistoric inhabitants of the GMCA utilized a consistent, long-lasting cultural tradition of hunting and gathering. This tradition lasted for over 11,000 years with remarkably little variation. Big and small game hunting was an important activity, and nomadic, small hunting and foraging groups were common inhabitants or visitors to the area.

The prehistory of the region can be divided into four broad periods: the Paleo-Indian Period, the Archaic Period, the Late Prehistoric Period, and the Protohistoric Period. The Archaic and Late Prehistoric periods are further divided into six culture historic phases. The Archaic period has four phases (the Great Divide, Opal, Pine Spring, and Deadman Wash phases) and the Late Prehistoric period has two phases (the Uinta and Firehole phases).

The Paleo-Indian Period began around 11,500 years ago, lasted until around 8,500 years ago, and was characterized by big game hunting and foraging. In the earlier parts of the period, large, now-extinct Pleistocene fauna were hunted, with spears being the most common hunting implements.

The Archaic Period was from around 8,500 years ago until about 1,800 years ago. This period was characterized by a shift from larger to smaller game hunting and an increase in the gathering and use of plant foods. This long-lasting phase included the adoption of the atlatl (spear thrower) and smaller darts as hunting implements.

The Late Prehistoric Period started around 1,800 years ago and lasted until about 250 years ago. It began with the introduction of several innovations, including pottery and the bow and arrow. The Late Prehistoric ended when Euro-American influences first began affecting the traditions of the indigenous cultures.

The Protohistoric Period was the time period when Euro-American influences were being incorporated into the indigenous cultures, but before actual contact with Euro-Americans was recorded. This period started around 250 years ago and ended about 180 years ago. Intense changes in the indigenous cultures occurred due to the influences of new resources (primarily horses, guns, and metals), as well as new trading networks and diseases.

Prehistoric sites are commonly found throughout the GMCA. Sites dating to the Paleo-Indian Period and Protohistoric Period are rare, but the other periods are well represented. The locations of these sites are associated with water sources, availability of food plants, game availability, material availability, and climatic characteristics. Known and suspected high-density prehistoric site areas fall along the Sweetwater River, near permanently or seasonally watered creek drainages, and around springs. Other areas of high site density include sand-covered landscapes around Crooks Creek and the sandy stretches of land from around Sweetwater Station to east of Ice Slough. It also appears that the lands in the southwest part of the GMCA were favored by bison and other big game hunters in prehistoric times, but this hypothesis remains untested.

Due to the large size of the GMCA, only a small percentage of the allotment has been inventoried for cultural resources. At present, eleven prehistoric cultural resource sites are known to be undergoing distress from past and current grazing-related effects. Livestock trampling and congregation causes impacts to sites through displacement of artifacts, destruction of features, and erosion. This in turn leads to loss of site information, context, and integrity. Sites known to be suffering effects from grazing include prehistoric campsites near springs (sites 48FR270, 48FR6100, 48FR6199, 48SW14319), along semi-permanent creeks (48FR414, 48FR1938, 48SW4882), along permanent creeks (48FR482), near lakes (48FR1908), and along ephemeral drainages (48FR3575 and an unnumbered site near Ice Slough).

Projections of undiscovered prehistoric sites along riparian zones within the GMCA have been developed. These projections estimate that approximately 600 not-yet-discovered prehistoric sites should be present along riparian zones within the GMCA. Most of these sites are postulated to be suffering from grazing-related effects.

Historic

The GMCA as a whole is rich in historic events and remains. Big game resources, extensive grasslands, the Sweetwater River, and South Pass, which provided a route over the Rocky Mountains, all contributed to early and continued use of the area by fur trappers, hunters, emigrants, livestock operators, and settlers.

The historic period in the GMCA can probably be said to have started when a party of Astorian fur trade explorers traveled through the area in 1812. But it wasn't until 1824 that a group of fur traders re-entered the area and advertised that an overland passage over the continent at South Pass was possible.

From the mid-1820s to around 1840, this part of Wyoming was explored and exploited mostly by fur trappers interested in procuring beaver and other pelts for sale in the U.S. and overseas. Together with government and other explorers, they discovered and mapped routes to the Far West.

In 1841, the first wagon trains traveled over what was to become the Oregon, Mormon, and California emigrant trails. Segments of these trails ran through the GMCA. The emigrants utilized South Pass, just west of the GMCA, to cross the continental divide, proving that those families with proper supplies and planning could successfully travel overland to the Far West.

The emigrant trail period lasted until 1868, when the transcontinental railroad was built through Wyoming. At the same time, a gold rush began on the south end of the Wind River Mountains, and settlement began in this portion of Wyoming.

Cattle ranching proved feasible beginning in the 1870s, and by the 1880s ranching had become a major economic activity. The area within the GMCA began to be settled at this time. Slightly later, sheep grazing and production also became a significant activity. Settlement and growth slowly increased from this time onward, spurred on by farming, ranching, and increased mineral exploration and development.

Post-1920 oil and gas exploration and development have occurred on the north and south sides of Crooks Mountain, around Crooks Gap, and at Bison Basin. Post-1950 uranium exploration and development has occurred around Crooks Gap, on Green Mountain, near Bison Basin, and nearby at Jeffrey City, which began as a uranium boom town.

Specific Historic Resources

The most significant historic resources in the GMCA are two different segments of the Oregon/Mormon/California/Pony Express National Historic Trails (OMCPE Trail). These segments are the main OMCPE Trail, and the Seminoe Cutoff (a major variant of the OMCPE Trail). The main OMCPE Trail is considered one trail through much of Wyoming, because all of these trails follow much the same route. The National Park Service and the BLM have long described the OMCPE Trail and its variants in central and western Wyoming as some of the best remains of these National Trails left in the United States. These trails include long stretches of well-preserved ruts, swales, and mostly intact historical settings. A small segment of the main OMCPE Trail runs through the northern tip of the GMCA, and a large segment of the Seminoe Cutoff is located within the northwest portion of the GMCA.

The main OMCPE Trail enters the GMCA where U.S. Highway 287 crosses Ice Slough (T.29N., R.93W., Section 6), and exits GMCA at the Sweetwater River at the historic Sixth Crossing near modern Sweetwater Station (T.29N., R.95W., Section 5). This portion of the Trail has been repeatedly evaluated since the 1980s, and its current overall condition is considered 'good-excellent': it possesses good-excellent integrity of ruts and swales, and mostly good integrity of the historical setting around the OMCPE Trail. In this 12-mile segment of trail, a highway, a small complex of houses and ranches, one upgraded road, and some barbed wire fences have affected the setting. However, those intrusions are infrequent and small enough that they do not affect the overall 'good-excellent' condition of the trail and its settings. Significant sites associated with the main OMCPE Trail within the GMCA include Ice Slough, the Warm Springs Pony Express Station, and 6th Crossing of the Sweetwater River.

Based on an examination of known riparian areas near the main OMCPE Trail, an estimated 0.4 miles of OMCPE Trail runs through riparian zones within the GMCA.

The Seminole Cutoff of the OMCPE Trail begins within the GMCA where it cuts off from the main OMCPE Trail (T.29N., R.95W., Section 1), and exits GMCA near Long Slough (T.28N., R.99W., Section 27) (see Map 3-9). This long stretch of trail (over 30 miles) has also been repeatedly evaluated since the 1980s. Due to differences in condition, several segments have been defined along the Seminole Cutoff within the GMCA. Each segment is described here:

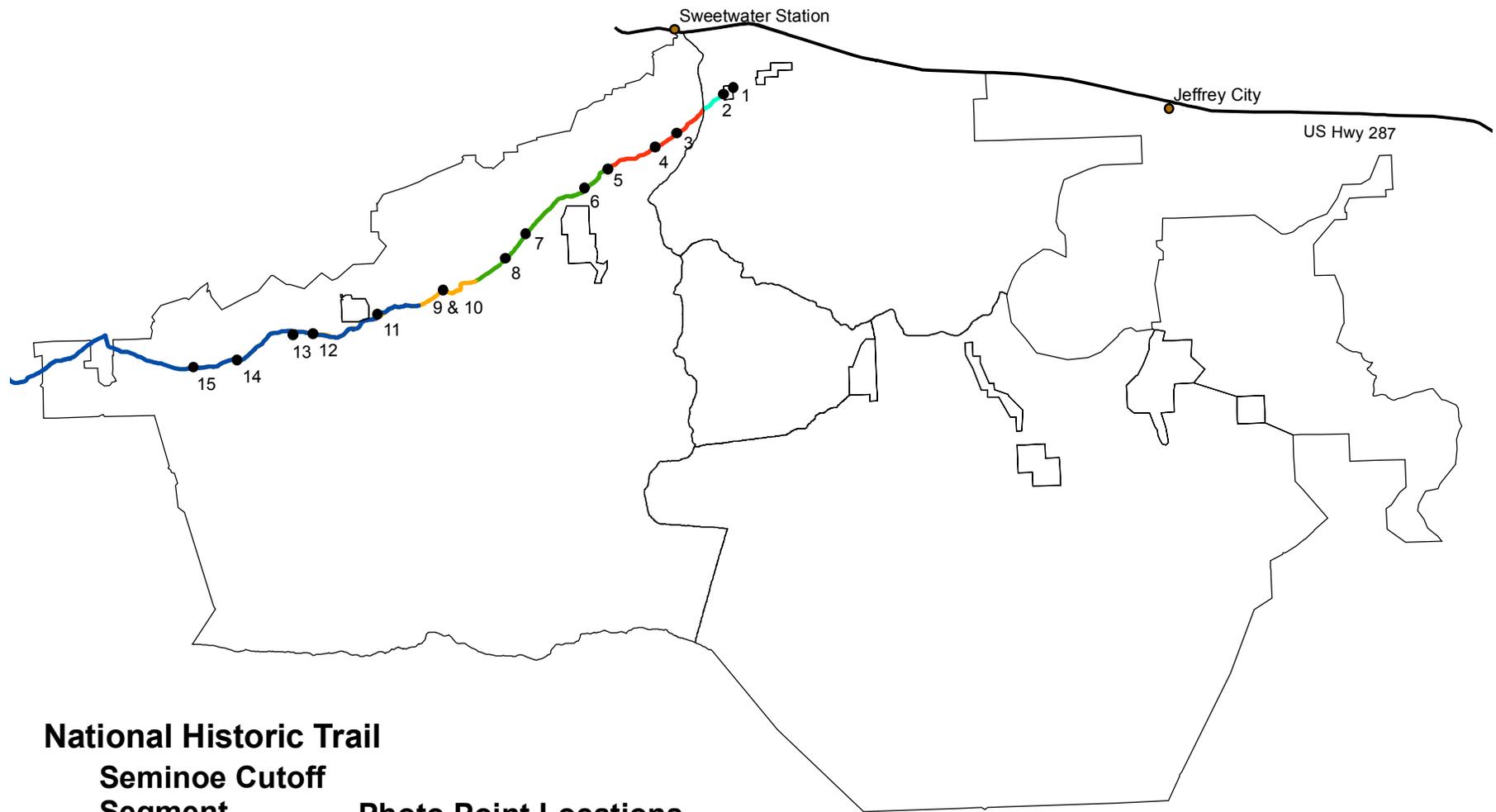
- Segment A starts at the beginning of the Seminole Cutoff and ends at the Bison Basin Road. This 1 ½-mile long segment condition is considered 'good'. Fences and an upgraded road are modern intrusions along this segment, but they are minor enough that they do not affect the overall 'good' condition of the segment and its settings. See photos 1 and 2 for details (Appendix 24).
- Segment B starts at the Bison Basin Road and ends just before the trail descends into the Alkali Creek valley. This 4 ½-mile long segment's condition is considered 'fair-good': the integrity of its ruts and swales is fair, and the integrity of its historical setting ranges from good to fair. Several old, unreclaimed well pads, the AT&T telephone cable, a fence, evidence of blading along the trail, and a few bladed roads are some of the modern impacts to this segment. Although the segment is still considered significant, the impacts along it have resulted in a 'fair-good' rating. See photos 3, 4 and 5 for details (Appendix 24).
- Segment C starts just east of the Alkali Creek valley and ends a little northeast of North Bear Mountain. This six-mile long segment's condition is considered 'good-excellent'. One unreclaimed well pad, the AT&T telephone cable, a windmill, and a trough are the modern impacts visible along this segment, but they are minor enough that they do not affect the overall 'good-excellent' condition of the segment and its settings. See photos 6, 7 and 8 for details (Appendix 24).
- Segment D begins slightly northeast of North Bear Mountain and ends at the 3 Forks-Atlantic City Road. This 11-mile long segment's condition is considered 'excellent': this segment possesses excellent integrity of ruts, and mostly excellent integrity of the historical setting around the trail. The historical and scenic settings along this segment are very good, and very few modern intrusions are present. The AT&T telephone cable scar is nearly healed and is often difficult to see, and other than one regular fence (on state land) and one buck and pole fence, the segment is untouched by modern intrusions until it reaches the 3 Forks-Atlantic City Road. See photos 9, 10, 11, 12, 13, 14 and 15 for details (Appendix 24).
- Segment E starts at the 3 Forks-Atlantic City Road and ends at the GMCA boundary fence near Long Slough. This five-mile long segment's condition is considered 'poor-good': this segment's ruts and swales have been destroyed in several places, and the remaining ruts and settings up to Section 27 have been impacted by the presence of upgraded roads, fences, and corrals. The trail in Section 27, however, has good integrity of ruts, and does not have modern visual intrusions around it; this final portion of trail within this segment is rated as "good".

Significant sites associated with the Seminole Cutoff within the GMCA include the Warm Springs Pony Express Station and the Sarah Thomas gravesite.

Based on an examination of known riparian areas near the Seminole Cutoff, an estimated 0.75 miles of the Cutoff runs through riparian zones within the GMCA.

Another historical resource of significance within the GMCA is the Rawlins-Fort Washakie Stage Trail. This trail

Map 3-9: Seminoe Cutoff Trail Segments



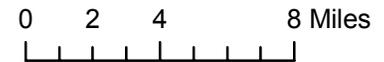
National Historic Trail

Seminoe Cutoff Segment

- A
- B
- C
- D
- E

Photo Point Locations

- Photo number



NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM

was a stage and freight route that connected the Sweetwater Valley, the Wind River Basin, and the fledgling communities of Lander and Fort Washakie with the railroad hub at Rawlins. It was utilized from the 1870s to early 1900s. This National Register-eligible trail is located within the eastern part of the GMCA, and the ruts and historical settings of this trail vary from excellent to poor.

The Rawlins-Fort Washakie Stage Trail enters the GMCA near Crooks Creek (T.27N., R.91W., Section 31), and runs within the allotment for about nine miles until it exits near Crooks Gap (T.28N., R.92W., Section 20). It reenters GMCA for about a mile near O'Brian Creek (T.29N., R.92W., Section 19). These segments of trail (approximately ten miles) have also been repeatedly evaluated since the 1980s. Due to differences in condition, several segments have been defined along the Rawlins-Fort Washakie Stage Trail within the GMCA. Each segment is described below and identified on Map 3-10.

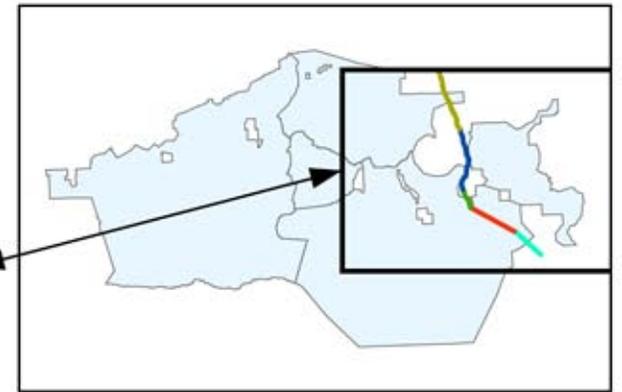
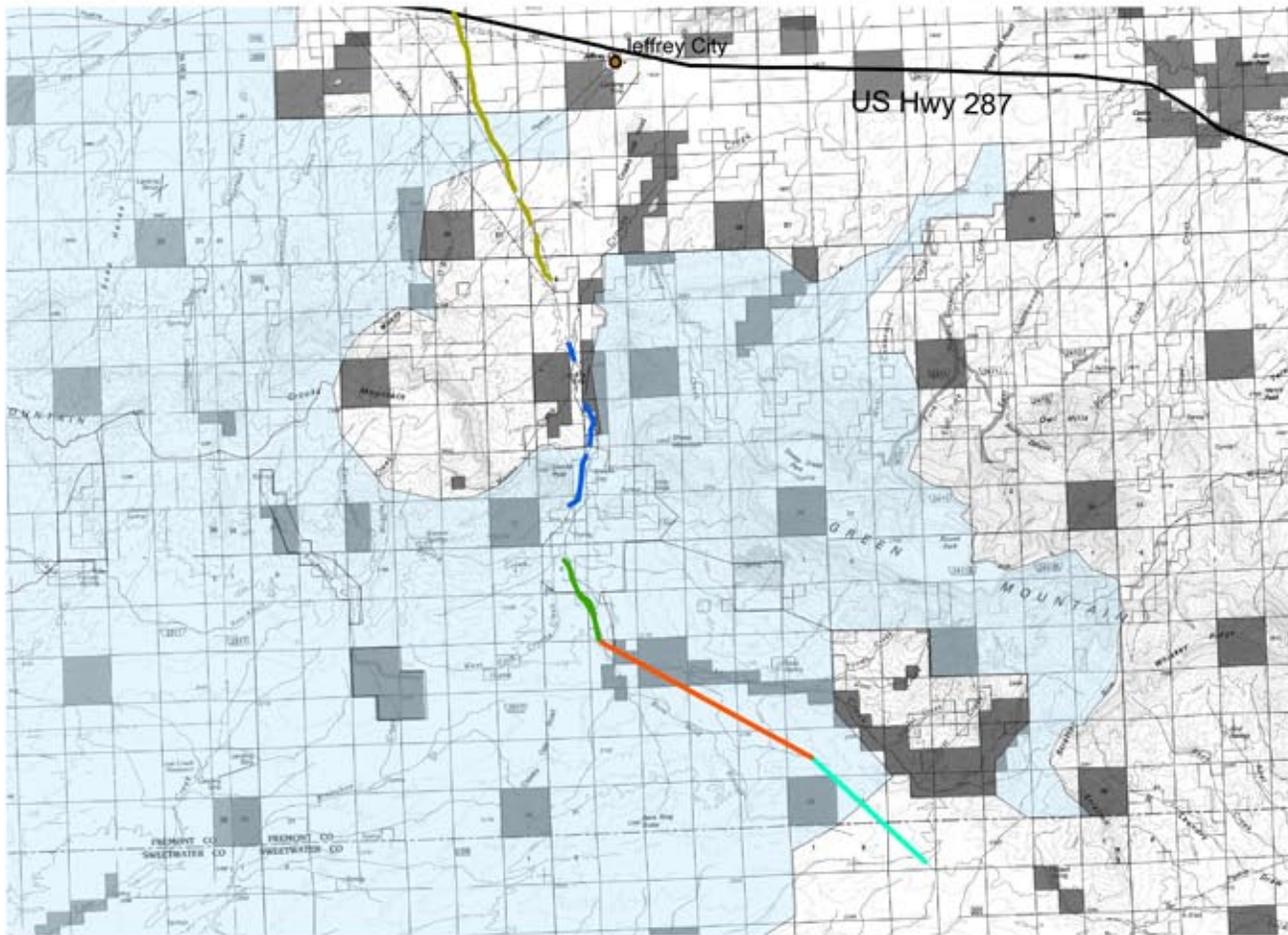
- Segment A begins where the trail enters the GMCA and ends soon after the vicinity of a major pipeline corridor that runs to Bairoil. This one-mile long segment's condition is considered 'poor': this segment's ruts and swales have been destroyed in several places, and the remaining ruts and settings have been impacted by the presence of upgraded roads, pipelines, power lines, and/or mining scars.
- Segment B starts after the Bairoil pipeline corridor disappears from view and ends at the Frontier/Exxon pipeline corridor crossing. This 5 ½-mile long segment's condition is considered 'good-fair': the integrity of its ruts and swales is good-excellent, and the integrity of its historical setting ranges from good to fair. One reclaimed well pad, an artesian well, fences, and far-off mining scars on Green Mountain are some of the modern impacts to this segment.
- Segment C starts at the Frontier/Exxon pipeline corridor and ends at the Crooks Gap-Wamsutter County Road. This 1 ½-mile long segment's condition is considered 'fair'. The nearby county road, fences, power lines, pipelines, and both close and far-off mining scars on Green Mountain are some of the modern impacts to this segment.
- Segment D starts at the Crooks Gap-Wamsutter County Road and ends near Crooks Gap. This 2 ½-mile long segment's condition is considered "poor" due to numerous modern intrusions.
- Segment E starts south of O'Brian Creek where the trail crosses the Section 19/30 boundary (T. T.29N., R.92W.), ends north of O'Brian Creek where the trail crosses the Section 18/19 boundary. This 1 mile segment is considered 'good'. The ruts and swales of the trail are in good shape, and the trail's historical setting is mostly good. A nearby pipeline parallels the trail, but is mostly not visible.
- Past grazing-related actions have caused adverse effects (as defined in the NHPA and Wyoming State Protocol) to the OMCPE Trail, its associated sites, and the Rawlins-Fort Washakie Stage Trail. Impacts have mainly come from the three following factors: 1) heavy grazing where trails run through riparian areas; 2) the introduction of new fences near the trails; and 3) the introduction of new water developments near the trails.
- Heavy grazing in trail riparian areas have caused adverse effects (as defined in the NHPA and Wyoming State Protocol) through direct damage to the historic trails and associated sites, as well as degradation of the trails' historical settings. Damage to trail ruts has been documented.
- Fences have degraded the historic trails through introduction of modern elements into the historical settings of the trails and their associated sites. However, for certain recent fencing projects (e.g., the Ice Slough Riparian Fence and the Warm Springs Riparian Fence), these impacts have been offset because the fencing projects have also reduced grazing pressures within those riparian areas, thus improving the overall historical settings of the trails and associated sites.

Water development projects have also directly and indirectly damaged the historic trails, associated sites, and their historical settings. Water developments have damaged and injected modern elements into historical areas. These developments have also attracted livestock, in turn increasing trampling and congregation near the trails. Fortunately, these projects have been few in number and have not had a major effect on the affected trails, sites, or their settings.

Native American Spiritual/Traditional/Sacred Sites

The GMCA lies within the lands used by several different tribes in historical and modern times. These tribes include the Eastern Shoshone, the Crow, the Northern Arapaho, the Northern Ute, and the Northern Cheyenne,

Map 3-10: Rawlins - Ft. Washakie Trail Segments



Rawlins - Ft. Washakie Trail Segment

- A
- B
- C
- D
- E

Green Mountain Common Allotment



0 2 4 8 Miles

NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM

among others. Certain cultural resource sites are important to the tribes in terms of their religious and traditional qualities. These sites can include burials, medicine wheels, rock art sites, cairns, alignments, stone circles, etc. There are several known sites of this type in the GMCA, and undoubtedly more will be discovered in the future.

RECREATION, VISUAL RESOURCES AND OPEN SPACE

The conceptual framework for recreation considers four linear tiers to the recreation environment. These four tiers are inputs (specific recreation management actions) that then interact with the system structure or recreation settings (prescribed and existing) which produce primary outputs in the form of activity, experience, and benefit opportunities. The final tier of this framework is customer realization of experiences and benefits (or outcomes) through the on-site use of the available opportunities. While a recreation program specifically undergoes management actions to target or provide opportunities for these experiences and benefits, other programs (e.g. range management) constitute an indirect input that interacts with this framework; this interaction can occur along every tier of the framework but is typically strongest at the setting level (Driver et al 1991). The settings tier of the framework is integral in that it “not only affects the next level of outputs (e.g. experiences and benefits), “but also helps to define what type of activities might occur in an area” (Pierskalla et. al., 2004). It is important to note that the recreation setting of an area cannot be attributed directly to one specific experience or subsequent benefit; rather, more important to the recreationist - and a direct product of the area’s setting - is the gestalt (or package) of experiences and benefits (Moore and Driver 2005). Moore and Driver (2005) further define the experience and benefits gestalt as “The group of most satisfying/gratifying/beneficial experiences that denote a total synergistic experience greater than the sum of its parts.”

Typically the relationships between the various recreational experiences and benefits both on-site and off-site are linked by a causality relationship termed the "Benefit Chain of Causality" (BCOC) (BLM 2004). The extent of these benefits typically flows from individuals to communities, environments and economies (BLM 2005).

The concept discussed above is often referred to as the beneficial outcomes approach to leisure or benefits based recreation management. IM 2006-60 affirms BLM’s corporate commitment to change its framework and emphasis to benefits-based recreation management. The IM states that until Land Use Plans incorporating agency policy on benefits based recreation management have been approved—and for completed land use plans which do not incorporate the above mentioned policies the BLM will assess and evaluate the effects of proposed projects in Special Recreation Management Areas on activities, experiences, beneficial outcomes, and recreation setting character to ensure consistency with benefits-based management concepts. Since the 1987 Lander RMP allocated Special Recreation Management Areas (SRMAs) numerous changes have occurred locally, regionally, and nationally on public lands. As a result the potential for new SRMAs in the GMCA area exists; therefore the preceding analysis will utilize the benefits-based management framework to a) characterize the existing recreation environment, and b) disclose potential impacts, identify stressors, and develop mitigation to alleviate or reduce impacts to the recreation resource resulting from the various AMP alternatives.

Recreation Setting of the GMCA

The BLM now describes the recreational setting across three main factors: 1) the character of the natural landscape (Physical Setting), 2) the character of recreation and tourism use (Social Setting), and 3) how public land agencies, county commissioners, private sector service providers, and open space managers care for the area and manage public use (Administrative Setting). These variables combine as descriptors of the recreation environment that can then be placed across a spectrum of 6 overall recreation settings. The 6 overall recreation settings spanning from least developed to most developed are: primitive (or pristine), back country, middle country, front country, rural, and urban. The BLM typically does not manage for urban settings. This BLM specific methodology for describing the recreation setting builds (in a recreationist friendly manner) on the historic Recreation Opportunity Spectrum concept and has been termed the natural resource recreation setting. Appendix 25 demonstrates this spectrum concept as well as the existing GMCA recreation setting range, existing condition and trend.

The Green Mountain Common Allotment provides opportunities for the local, national, and international public to experience public lands in a variety of settings and environments. Dominant recreation activities within the allotment include hunting, fishing, camping, hiking, horseback riding, wildlife/wild horse viewing, and driving for pleasure. Maps 3-11, 3-12, and 3-13, respectively, display the existing physical, social, and administrative

recreation settings of the Green Mountain Common Allotment. Of particular interest to a large portion of GMCA visitors is the open, undeveloped nature of the landscape.

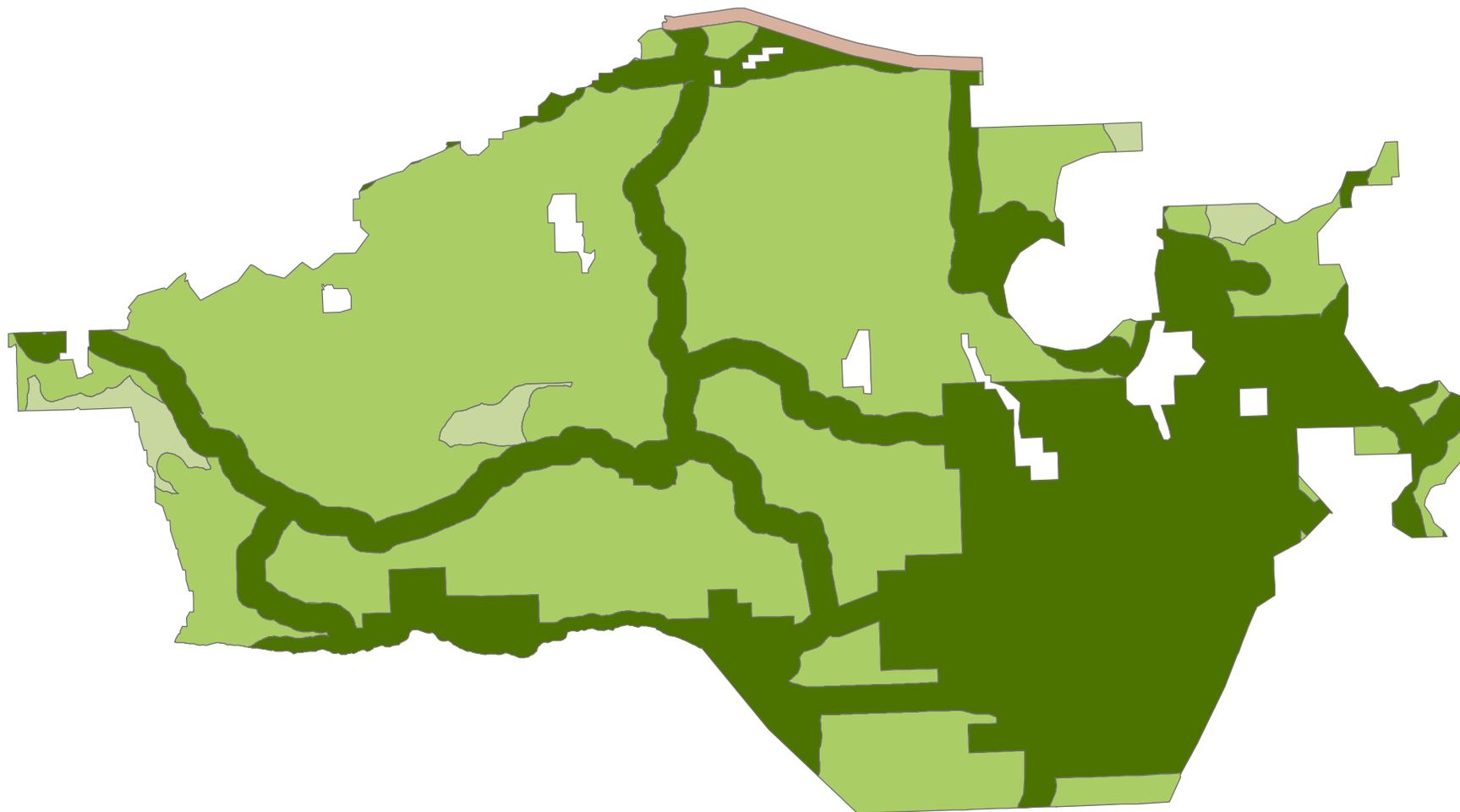
GMCA Physical Setting: Range, Existing Condition, and Trends

The physical setting of the GMCA ranges from back country to rural. The dominant physical setting in the allotment is middle country. Areas containing this setting are the main focus of recreationists on the allotment. The back country areas in the allotment comprise a small portion of the available recreation setting. Since these settings are available on a very low level (field office wide), recreationist demand for these areas is high. In addition these areas are highly susceptible to change and alteration, meaning stressors that impact these settings tend to drastically shift these settings toward a more developed setting.

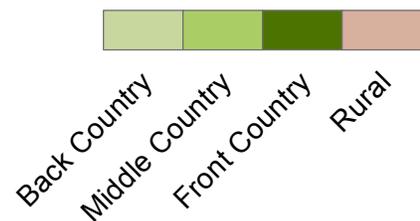
The physical recreation setting on the GMCA is demonstrating an urbanizing trend, or movement toward more modified recreation settings. This trend shows reductions in the availability of back country and middle country settings while front country physical settings increase. Front country and rural areas provide for drastically different recreation activities, experiences, and benefit opportunities than areas providing back country and middle country settings. In addition, these settings are available closer to urban centers; therefore recreationists do not need to travel to places (like the GMCA) to experience these settings.

Finally, front country and rural settings are less susceptible to increased change for the simple fact that they already represent a modified environment. The physical setting trend documented above is a result of several factors including: 1) new road development/improvement in support of recreation and other resource uses as well as route proliferation due to the rising popularity of OHVs for recreational and industrial uses 2) Increasing occurrences and instances where landscapes are modified to accommodate other resource uses. These modifications include, utility lines, fence lines, stock ponds/water developments, cell phone towers, oil and gas developments etc., and 3) an increase in new recreation facilities to accommodate user demand or reduce visitor impact or conflict.

Map 3-11: Physical Recreation Setting

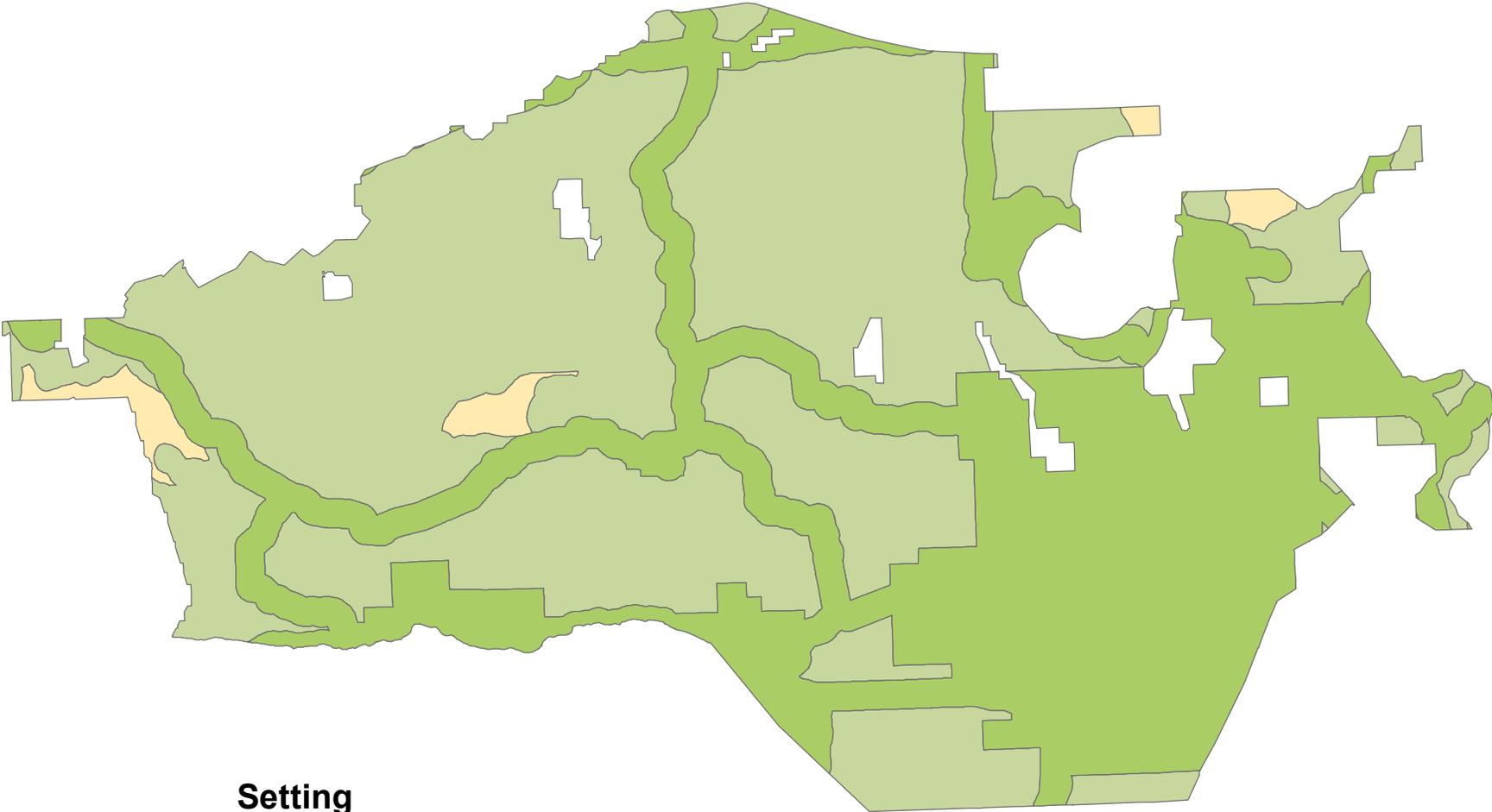


Setting



NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

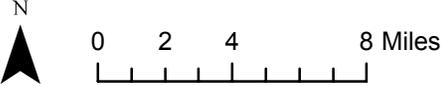
Map 3-12: Social Recreation Setting



Setting

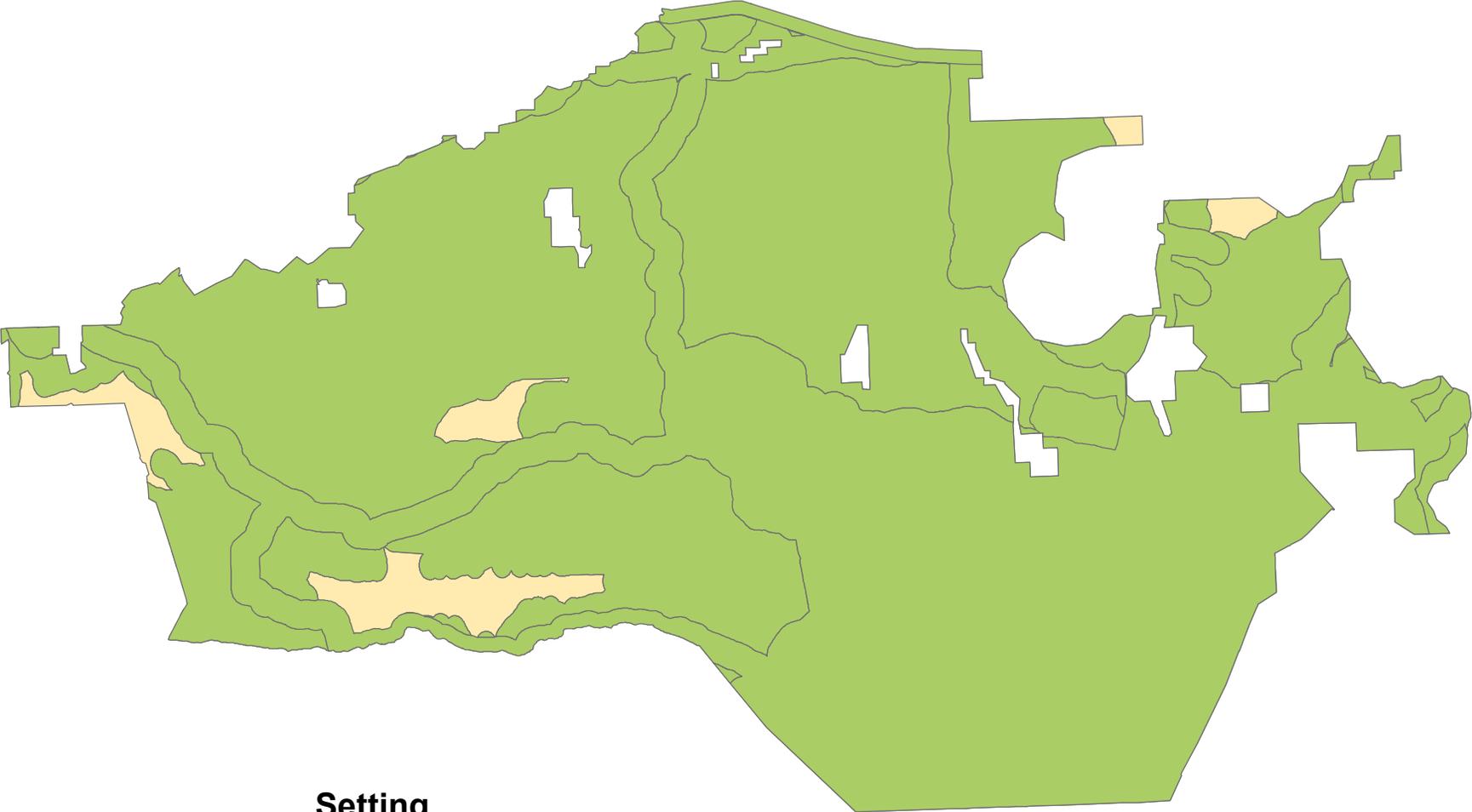


Primitive
Back Country
Middle Country



NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

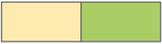
Map 3-13: Administrative Recreation Setting



Setting

Linking Primitive to Backcountry

Middle Country



NO WARRANTY IS MADE BY THE BLM FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM.

Table 3-18. GMCA Physical Setting Condition and Trend

	Settings Decreasing in Availability		Increasing
	Least available	Most available	Next most available
Physical Setting Indicator	Back Country	Middle Country	Front Country
Remoteness	More than ½ mile from any road, but not as distant as 3 miles, and no road in site	On or near four-wheel drive roads, but at least ½ mile from all improved roads, though they may be in sight	On or near improved country roads, but at least ½ mile from highways
Naturalness	Natural appearing landscape having modifications not readily noticeable	Natural appearing landscape except for obvious primitive roads	Landscape partially modified by roads, utility lines, fence lines etc. but none overpower natural landscape features
Facilities	Some primitive trails made of native materials such as log bridges and carved wooden signs	Maintained and marked trails, simple trailhead developments, improved signs, and very basic toilets	Improved yet modest, rustic facilities such as campsites, restrooms, trails, and interpretive signs

GMCA Social Setting: Range, Existing Condition, and Trends

The social setting of the GMCA ranges from primitive to rural. The dominant Social setting in the allotment is back country. Areas containing this setting are the main focus of recreationists on the allotment. The primitive social areas in the allotment comprise a small portion of the available recreation setting. Since these settings are available on a very low level (field office wide), recreationist demand for these areas is high. In addition these areas are highly susceptible to change and alteration, meaning stressors that impact these areas tend to drastically shift these settings toward a more developed setting. Overall the GMCA area possesses a social setting that reflects more remote/pristine physical settings (i.e., as access increases, visitor encounters and evidence of use should increase). This means that although physical setting indicators demonstrate a less than primitive setting, socially the allotment provides ample opportunities for isolation and solitude. This could probably be attributed to the area’s travel distance from urban centers and lack of extractive industry interest.

The social recreation setting on the GMCA is demonstrating an urbanizing trend, or movement toward more modified recreation settings. This trend shows reductions in the availability of primitive and back country settings while middle country physical settings are increasing. Overall the social setting of the allotment is slowly changing from an area where ample amounts of isolation and solitude are available to an area that appears slightly busy with recreational and resource use activities increasing. With this increase in use comes a higher instance of visitor evidence. This social setting trend is a result of: 1) increasing planning area population participating in outdoor recreation, 2) increased demand for group activities, 3) increased national recreation interests in the area, and 4) increase popularity of motorized vehicles resulting in increased visibility of evidence of past users. Refer to Table 3-19.

Table 3-19. GMCA Social Setting Condition and Trend

Social Setting Indicator	Settings decreasing in availability		Increasing
	Least available	Most available	Next most available
	Primitive	Back Country	Middle Country
Contacts (with other groups)	Fewer than 3 encounters/day at campsites and fewer than 6 encounters/day on travel routes	3-6 encounters/day off travel routes and 7-15 encounters/day on travel routes	7-14 encounters/day off travel routes and 15-29 encounters/day en route
Group Size	Fewer than or equal to 3 people/group	4-6 people/group	7-12 people/group
Evidence of Use	Only foot prints observed	Footprints plus slight vegetation trampling at campsites & travel routes; litter infrequent	Vehicle tracks and occasional litter and soil erosion, vegetation becoming worn

GMCA Administrative Setting: Range, Existing Condition, and Trends

The administrative setting of the GMCA ranges from primitive to rural. The dominant administrative setting in the allotment is middle country. Areas containing this setting are the main focus of recreationists on the allotment. The linking primitive to back country areas in the allotment comprise a small portion of the available recreation setting. These areas neither demonstrate a strong correlation to primitive or backcountry settings and are therefore somewhere between these two settings. Since these settings are available on a very low level (field office wide), recreationist demand for these areas is high. In addition these areas are highly susceptible to change and alteration, meaning stressors that impact these settings tend to drastically shift these settings toward a more developed setting.

Table 3-20. GMCA Administrative Setting Condition and Trend

Administrative Setting Indicator	Settings Decreasing in Availability		Increasing
	Least available		Most available
	Linking Primitive to Backcountry		Middle Country
Mechanized Use	None whatsoever	Mountain bikes and perhaps other mechanized use, but all is non-motorized	Four wheel drives, all terrain vehicles, dirt bikes, or snowmobiles in addition to non-motorized, mechanized use
Visitor services	None is available onsite	Basic maps, but area personnel seldom available, to provide on-site assistance	Area brochures and maps, plus personnel occasionally present to provide on-site assistance
Management Controls	No visitor controls. No use limits, enforcement presence very rare	Signs at key access points on basic user ethics. enforcement presence rare	Occasional regulatory signing. Motorized use restrictions. random enforcement presence

Unique Situational Attributes

Clark et al. (1979) defined a recreation setting as “the combination of physical, biological, social, and managerial

conditions that give value to a place.” The recreation settings discussed above generalize these factors in order to develop a continuum or spectrum; therefore, consideration of area specific situational attributes (attributes not contained within a setting matrix) will also be considered across the GMCA. One example of a situational attribute within the GMCA is the lack of permanent fences. Currently, the lack of permanent fences within the allotment provides visitors with a physical setting that allows for unencumbered, non-motorized cross country travel of great distances. Sanderson et al (1986) found, that as livestock management intensities (including level of fencing) increased, visitor demand or enticement for an area decreased. Map 3-14 displays this unique situational attribute and its availability within the Lander Field Office. The experiences and benefits opportunities available from this situational attribute and the general setting of the area are distinctive and in short supply (Table 3-21 characterizes the general recreation experience and benefits gestalt of the GMCA).

Table 3-21. Recreation Experiences and Benefits Package Available in the GMCA

Experiences	On Site Benefits	Benefits (On or Off Site Customer)	Benefits (On or Off Site Customer)
Enjoying having easy access to natural landscapes	Individuals: Enhanced awareness and understanding of nature	Environment: Increased awareness and protection of natural environments	Community: Greater Community involvement in recreation and other land use decisions
Enjoying the sensory experience of a natural landscape	Individuals: Greater sensitivity to/awareness of outdoor aesthetics.	Environment: Maintenance of distinctive recreation setting character	Economic: Maintenance of community's distinctive recreation-tourism market niche or character
Feeling good about solitude, being isolated, and independent.	Individuals: Greater sense of adventure	Individuals: Greater self reliance	Economic: Improved local and economic stability

Based on discussions with on site and off site customers it is estimated that these experiences and benefits are generally realized at a moderate (30-60 percent of visitors) level; this could be attributed to the fact that the Lander Field Office does not currently market or directly manage for these experiences and benefits. However, the opportunity to target these experiences and benefits and to develop recreation management actions and inputs to better deliver these experiences and benefits to customers does exist.

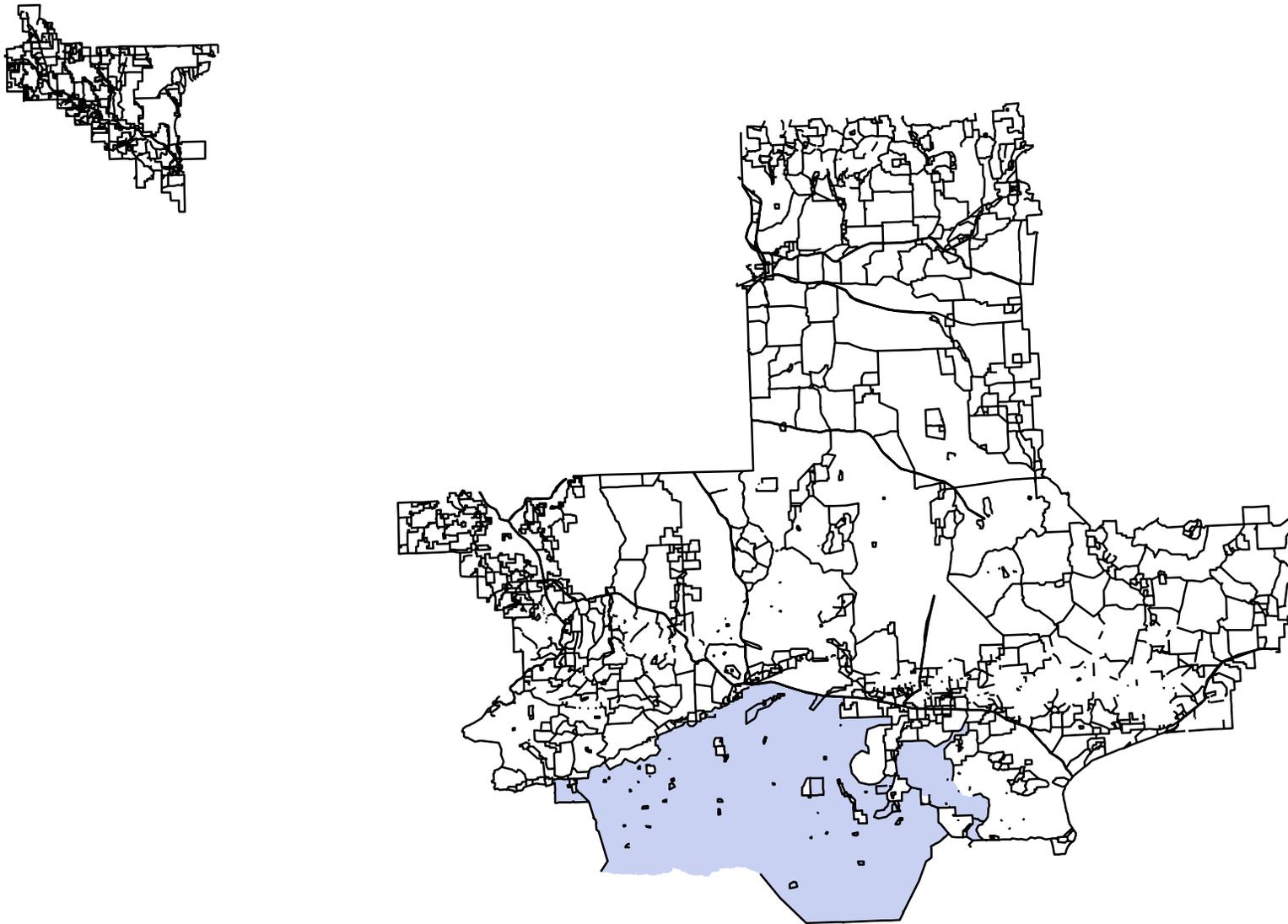
The sheer size of the allotment invariably spans numerous recreation features where recreation program inputs and unique situational attributes produce specific experiences and benefits opportunities to the visitor beyond or above what is generally provided throughout the allotment. The experience and benefit opportunities produced as a result of the features are typically produced in concert with the overall benefits garnered in the allotment; this combination of experience and benefits opportunities represents the allotment’s unique contribution to these recreation features. Therefore, recreation management inputs and other program’s indirect inputs (e.g. range management) within the Green Mountain Common Allotment have both onsite (portions of the feature within GMCA) and offsite (the feature as a whole) impacts on these recreation features.

It is important to note that these features overlap and often share similar portions of the allotment; this is due to contrasting visitor motivations for using the specific feature (e.g. hunters can use the Seminole Cutoff to achieve their desired experiences and benefits while not necessarily directly seeking those available from the historic feature). Two of the areas (National Historic Trail and Continental Divide National Scenic Trail) are allocated as Special Recreation Management Areas; this means that recreation is the management focus within these areas. These areas have similar recreation setting ranges, existing condition, and trends as those documented for the larger allotment

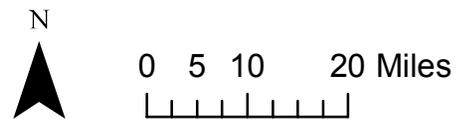
General Public Big Game Hunting Recreation Feature

The GMCA is part of a larger recreation feature that encompasses 75 percent of the field office (1,864,659 million acres) and is comprised of several big game hunting units. Within these big game hunting units, the BLM manages

Map 3-14: Known Fences Within the Lander Field Office



- Existing fences
- Green Mountain Common Allotment



NO WARRANTY IS MADE BY THE BLM FOR USE OR THE DATA FOR PURPOSES NOT INTENDED BY BLM.

over 75 percent of the land base; therefore, within this complex the agency is the main provider of big game hunting opportunities. The GMCA comprises 27 percent of this features total area. Importantly, these opportunities are available to all members of the public and provide trophy and subsistence hunting prospects. Table 3-22 below shows the national rank according to the Boone and Crocket Club (Helmer 2002, 2003) of 1) the state, and 2) the GMCA county rank or the counties general level (low, medium, high) of trophy harvests.

Species	Wyoming's National Rank	National County Rank Or General Levels of Trophy Entries		
		Carbon*	Fremont	Sweetwater
Antelope	1	1	4	2
Elk	3	Medium	High	Low
Mule Deer	4	Low	Medium	Medium

* Carbon County is adjacent to the GMCA

Table 3-23 displays the experience and benefits opportunities available to a hunter and host community as a result of this situational attribute, the recreational setting, and resulting activity availability. This larger combination of several big game hunting units (as designated by the Wyoming Game and Fish department) is where the BLM serves as the majority provider (land/habitat manager) of trophy and subsistence hunting activity opportunities. An important aspect or situational attribute of this feature's physical setting is the quality and habitat of big game populations.

Table 3-23. Recreation Experiences and Benefits Package Available in the General Public Big Game Recreation Feature

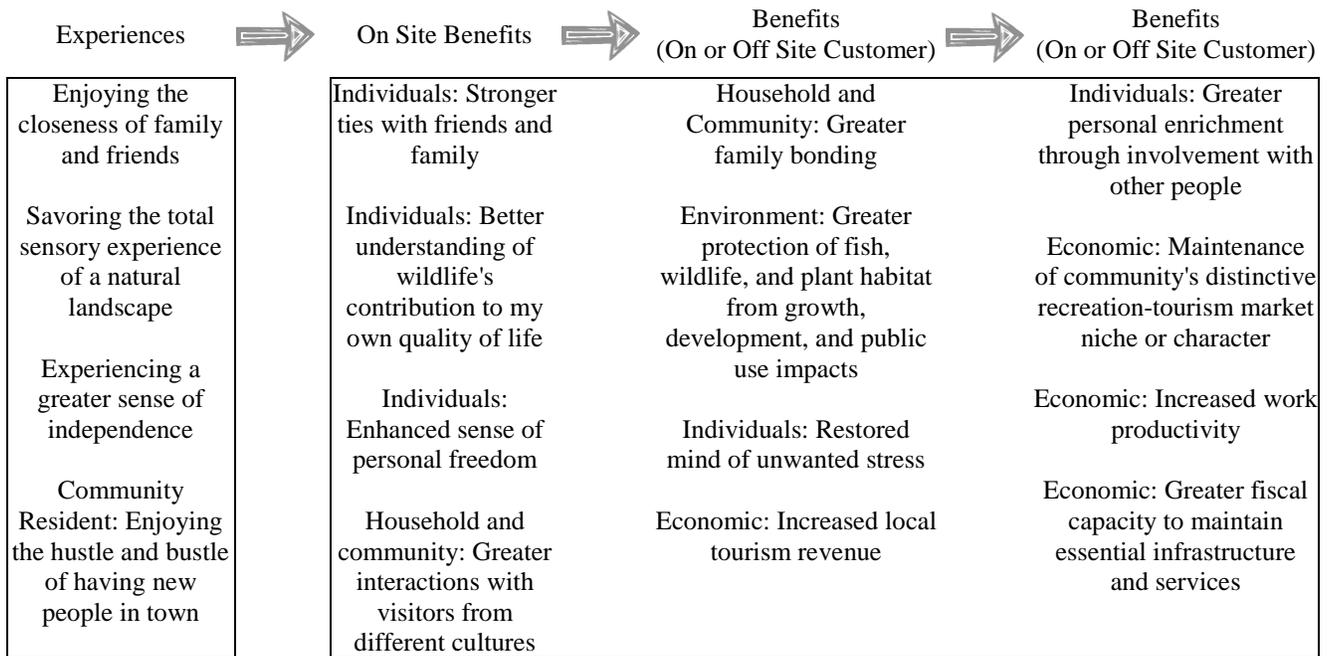


Table 3-24. Recreation Experiences and Benefits Package Available in the CDNST SRMA

Experiences	On Site Benefits	Benefits (On or Off Site Customer)	Benefits (On or Off Site Customer)
Visitors testing their endurance	Individuals: A more holistic sense of wellness	Individuals: Improved Physical fitness and health maintenance	Economic: Reduced health maintenance costs
Contemplating mans relationship with the land	Individuals: Closer relationship with the natural world	Environmental: Increased awareness and protection of natural landscapes	Environmental: Greater retention of distinctive natural landscape features
Enjoying risk-taking adventure	Individuals: Improved competence from being challenged	Individuals: Increased ability to think things through and solve problems	Household and Community: Enhanced Lifestyle
Community/Resident Experience of knowing this attraction is near the community	Individuals: Improved understanding of the community's dependence and impact on public land	Household and Community: Heightened sense of satisfaction with the community	Economic: Increased desirability as a place to live or retire

Green Mountain Recreation Feature

Over the last 50 years, the BLM Lander Field Office and other recreation providers have financed substantial recreation projects into this area, including Cottonwood Campground, Fremont County Campground, Wild Horse Point picnic area/scenic overlook, and road upgrades/maintenance along the mountain’s Loop road. These investments have changed the recreational setting of the area while also increasing the public demand. These setting alterations have produced a set of recreation experiences and benefits opportunities not available in the rest of the allotment. Some of the dominant activities in the area include driving for pleasure, hunting, camping, wild horse/wildlife viewing, and hiking/picnicking. The majority of this area is outside the allotment; however, the portion of the area within the allotment is an important component of the area, and includes the Fremont County Campground and the West Loop Road Area. Table 3-25 below shows the experience and benefit opportunities available from the Green Mountain recreation feature.

Table 3-25. Recreation Experiences and Benefits Package Available in the Green Mountain Recreation Feature

Experiences	On Site Benefits	Benefits (On or Off Site Customer)	Benefits (On or Off Site Customer)
Enjoying meeting new people with similar interests	Individuals: Improved skills for outdoor enjoyment with others	Individuals: Greater personal enrichment through involvement with other people	Household and Community: Reduced social alienation
Enjoying having easy access to natural landscapes	Individual: Greater freedom from urban living	Individuals: Restored mind of unwanted stress	Individuals: Reduced hypertension
Having others nearby who could help you if needed	Individuals: Greater sense of personal security	Household and Community: More informed citizenry about where to go for different kinds of recreation experiences and benefits	Economic: Increased desirability as a place to live or retire
Enjoying having a wide variety of environments and settings within a single recreation area	Individuals: Increased adaptability	Economic: Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits	Economic: Increased local tourism revenue

Continental Divide National Scenic Trail (CDNST) Special Recreation Management Area

This Special Recreation Management Area (DOI BLM 1986) runs through the GMCA allotment for approximately 55 miles of the 74 total CDNST miles managed by the Lander Field Office. The GMCA section of the CDNST traverses a visually unmodified Wyoming Basin Physiographic province creating unique visual and recreational experiences for trail hikers. An important biologic component and situational attribute to the recreation setting and outcome opportunities of the CDNST is the aesthetic and physical condition of non-potable water sources. In addition, the type and level of cattle encounters that occur on or near the CDNST stand to influence visitor experiences and benefits (Mitchell et al 1996). These water sources are critical for sustaining long distance travel across the GMCA section of the trail.

Concern has been voiced by trail hikers who have encountered degraded riparian systems where cattle were allowed to congregate. Since one limiting factor to crossing the GMCA portion of the CDNST is the availability of water, impacts to riparian corridors become more noticeable when recreationists using the trail need to collect quality water for consumption in these high livestock utilization areas. Most water purification methods will remove potentially-harmful bacteria; however, hikers do turn down these tainted water sources out of concern for the appearance and aesthetics of the water. In contrast, existing water sources that have been fenced from livestock along the CDNST provide quality non-potable water to trail hikers as well as enhance surrounding ecological systems. Table 3-24 displays the recreation experiences and benefits opportunities anticipated as a result of current managerial inputs into the trail corridor, the existing situational attributes, and the existing recreation setting.

National Historic Trail Special Recreation Management Area

This Special Recreation Management Area is mostly outside of the GMCA, with an exception to the portion historically known as the Seminole Cutoff. The Seminole Cutoff's (GMCA portion) contribution to the trail's overall recreation settings, experiences and benefits is available in very few places along the entire National Historic Trail Corridor, and is considered an important resource to National Historic Trail-focused recreation. This portion of the trail corridor provides a rare opportunity for public land visitors to view the trail in an unmodified (free of human development and intrusion) setting, where the wagon ruts are readily noticeable and visitor densities are extremely

low. The visual quality of the historic trail is an important situational attribute that contributes to the overall recreation experiences and benefits along the corridor; visually unaltered or nearly unaltered view sheds enhance the recreational opportunities available to recreationists while also instilling a nearly historically-accurate experience (see Table 3-26).

Table 3-26. Recreation Experiences and Benefits Package Available in the NHT SRMA

Experiences	On Site Benefits	Benefits (On or Off Site Customer)	Benefits (On or Off Site Customer)
Learning more about our cultural heritage and history	Individuals: Greater respect for cultural heritage	Individuals: Enlarged sense of wonder	Household and Community: Greater household awareness of and appreciation of our cultural heritage
Community Resident: Sharing our cultural heritage with new people	Individuals: Increased appreciation of area's cultural heritage	Individuals: Improved visitor awareness, learning and appreciation of the areas cultural values	Economic: Increased desirability as a place to live or retire
Community Resident: Communicating our cultural heritage with those already living here	Individuals: Better understanding of communities cultural identity	Environment: Reduced looting and vandalism of historic sites	Environment: Sustainability of community's cultural heritage
Community Resident: Feeling good about the way our cultural heritage is being protected	Individuals: Greater appreciation for my wild land and parkland heritage and how managers care for it	Environment: Better protection of the areas historic structures and archaeological sites	Economic: Maintenance of community's distinctive recreation-tourism market niche or character

Wilderness Study Areas and Wild and Scenic Rivers

The current Sweetwater Canyon Wilderness Study area has also been found to be eligible and suitable for inclusion in the Wild and Scenic River Program. These eligibility and suitability determinations have not been reviewed by the public or included in a resource management plan and are therefore considered to be interim determinations. Pursuant to the Wild and Scenic Rivers Act of 1968, as amended, until the public reviews are completed and final decisions are made on the WSR suitability determinations, no use of the reviewed Bureau of Land Management administered public lands will be authorized which could impair any outstandingly remarkable values they may contain, or would otherwise reduce their tentative classification or destroy their potential suitability for consideration for inclusion in the National Wild and Scenic Rivers System. In order to meet this mandate the BLM developed a set of interim management objectives for the Sweetwater River WSR that included:

“Interim management practices for the public land parcels along the Sweetwater River unit meeting the wild classification will focus on maintaining or enhancing the outstandingly remarkable scenic, recreational, historical, and ecological values and maintaining the relatively primitive, pristine, rugged, and unaltered character of the area. Any activities that would conflict with this objective and any physical visual intrusions on the public lands involved are prohibited.”

Specific recommendations for livestock grazing included: “Increases in active grazing preference on public lands are [in the WSR area] is prohibited. Construction of new range improvements that protect or enhance outstandingly remarkable values and do not adversely impact the wild classification may be allowed.”

The interim management boundary for the Wild and Scenic River is the same area contained within the WSA boundary. In addition the values listed as outstanding/remarkable and the interim management recommendations contained within the interim determinations requires similar assessment and impact threshold determinations as is

required for WSAs. Therefore any discussion pertaining to the WSA from this point forward also applies to the Wild and Scenic interim determinations and management objectives.

Approximately 1,900 acres of the Sweetwater Canyon Wilderness Study area lies within the Green Mountain Common Allotment. This constitutes 20% of the total acreage of the entire WSA; the other portion of the WSA is utilized as a pasture for use by permittees operating in the Silver Creek Common Allotment. The portion of the WSA within the GMCA does not include lands along the Sweetwater River which is considered to be the main feature of the WSA. The portion of the WSA inside of GMCA does however include: a) portions of the WSA recommended (by BLM) to Congress for designation as Wilderness, b) critical tributaries of the Sweetwater River, c) areas within the viewshed of the WSA, and d) areas utilized for recreationists to access and experience the WSAs.

An important distinction between WSAs and Wilderness areas lies in the fact that WSAs are areas that have been found to possess wilderness characteristics. The Wyoming BLM made recommendations to Congress (1991) in regards to which areas met the criteria to be managed as Wilderness. To date, no Wyoming BLM has been designated or released from the Wilderness system by Congress. For a WSA to become Wilderness Congress must designate those lands as such, until Congress acts on these areas BLM is obligated by policy to manage these lands so as not to impair Congress' ability to designate the area as Wilderness. Further guidance on the management of BLM WSAs is dictated by the *Interim Management Policy (IMP) for Lands Under Wilderness Review* (H-8550-1).

The IMP contains policy that specifically applies to livestock grazing as discussed below:

- Grandfathered vs. Non-grandfathered uses- to be a grandfathered (existing use), “the use clearly must have been taking place on the lands as of the date of approval of FLPMA (October 21, 1976)...However, new grazing (e.g., change in numbers, kind, or class of livestock, or season of use), expanding the area authorized for grazing, or new facilities are not grandfathered. The current grazing (numbers, kind, class of livestock, and the season of use) within the GMCA and the Sweetwater Canyon is significantly different from that which occurred in 1976. Based on the IMP the grazing within the WSA is considered to be non-grandfathered or grazing that was not authorized and used during the 1976 grazing season. On October 21, 1976, grazing management was continuous-season long grazing primarily from cattle. This grazing occurred from May 1 until November 1 each year. Occasionally, some sheep grazing occurred within the canyon. Prescribed grazing management systems were not in place until 1997. Since 1999, the prescribed grazing has been deferred-rotation management on the portion of the WSA outside of the riparian management fence (South Sweetwater Fence). Monitoring studies were established in the canyon beginning in 1997. There are no monitoring studies established on the 1900 acres within the GMCA.
- In both grandfathered and non-grandfathered grazing, changes may be allowed in number, kind, or season of use if, following the preparation of an EA (if not adequately addressed in an existing NEPA document), the effects are found to be negligible. Changes cannot cause declining conditions or trend of the vegetation or soil and cannot cause unnecessary or undue degradation of the lands. The assessment of the proposal must include an evaluation of the effects of the following parameters and wilderness values: natural ecological condition of the vegetation, the visual condition of the lands and waters, erosion, changes in the numbers or natural diversity of fish and wildlife, and all wilderness values.
- The standard for establishing and quantifying wilderness values is the condition of the lands at the time the area was designated as a WSA or the current condition, whichever is determined to be in better condition.
- The impact is the change from the required standard identified in the existing condition to the condition anticipated by implementing the proposed increase. Table 3-27 identifies the maximum acceptable impact for each of the required data elements. If the impact to any data element exceeds the standards established in the table, it exceeds the standard of negligible and is significant. A permanent increase may be authorized when five years of monitoring without an adjustment indicates that the impacts have not exceeded the maximum allowable impacts.
- New livestock developments may be approved if they truly enhance wilderness values, and the developments are substantially unnoticeable. New developments must not require motorized access if the

area were designated as wilderness.

Table 3-27. Maximum allowable Impacts

Wilderness Value	Required Data Element	Maximum allowable impacts
A) Visual Resource	A1) Existing Visual Resource	A1) Low Contrast
B) Naturalness and solitude	B1) Level of human activity including use supervision, management, and maintenance B2) Presence and distribution of wildlife B3) Facilities B4) Presence of pristine areas or conditions.	B1) Negligible or no noticeable increase in human activity. B2) Negligible or no noticeable impact or evidence of livestock B3) No additional facilities B4) Negligible or no noticeable impact
C) Planning	C1) Plan objective	C1) Conformance with existing plan
D) Primitive Recreation	D1) Type of recreation opportunities D2) Dependence of opportunities on a natural appearing environment	D1 and D2) No reduction in availability or quality
E) Special Features	E1) Type and quality of special features	E1) Negligible or no noticeable reduction in quality
F) Surface Water	F1 Quality	F1) Federal and/or state standards
G) Vegetation	G1) Ecological Site Inventory G2) Trend from at least two points in time. G3) Utilization by key species. G4) Threatened or endangered plants. G5) Plant vigor G6) Actual use and preference. G7) Climate and precipitation. G8) Historic and existing range management practices.	G1) No lowering in seral condition. G2) 50% utilization of key species or existing plan decision G3 and G4) No negative impact G5) Healthy vigorous plants
H) Wildlife	H1) Threatened or endangered animals H2) Wildlife populations H3) Population estimates H4) Diversity	H1) No negative impact H2) No negative impact H3) No negative impact H4) No negative impact

A1) Visual Resource

The table below characterizes the overall visual landscape of the WSA:

Table 3-28. Overall Visual Landscape of the WSA

	Land/water	Vegetation	Structures
Form	Rolling hills, with steep draws. Irregular rock formations randomly appear across the landscape. River meanders through a sharp canyon corridor. Slopes and cliffs of the canyon corridor appear blocky.	Random clumps of sagebrush on uplands, Irregular forms of willows and riparian grasses in areas containing water. Deciduous trees and conifers add appeal to the landscape. Heavily grazed areas are missing movement component from tall grasses and appear flat.	Primitive two track roads throughout the WSA introduce an unnatural straight line. The existing riparian fence meanders and utilizes topography in a manner that compliments the existing landscape.
Line	Strong distant horizon lines in all direction on top of the canyon rim. Very strong horizon lines dominate viewshed from within the canyon river way	Riparian area vegetation creates a digital contrast line between uplands.	Areas where the fence travels in a nearly straight direction are affected by this symmetry. Small portions of the fence contrast with the existing canyon skyline
Color	Black rocks with brown patches of bare ground. Water appears iridescent blue and adds movement element to landscape.	Sagebrush green/upland grass tan. Riparian area green to dark green. Aspens, willows, and cottonwoods add appealing visual contrast.	Roads have earthen brown tones broken by vegetation. The fence color tends to blend with the existing landscape when viewed from a distance. The level of color contrast i from the fence increases as observer gets closer
Texture	Jagged in rocky areas, smooth to course in others. Water channel appears smooth in some areas course in faster sections.	Smooth to moderately course	

The existing Lander Field Office Resource Management Plan allocated the Sweetwater Canyon WSA as a Class 2 visual management class. New guidance since the land use plan (IM-2000-096) requires the BLM to manage all special areas including WSAs as a Class 1 visual resource. The BLM Visual Resource Contrast Rating Handbook (H-8431-1 Appendix 2) gives further definition to this class in stating:

“The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change [as measured by the contrast rating system] to the characteristic landscape should be very low and will not attract attention.”

A key factor to the visual environment in regards to grazing management in WSAs is healthy looking and tall vegetation, in addition the most cited visitor indicator of improper grazing management is overgrazing and impacted or short vegetation (Johnson et al 1997). Overall the Sweetwater Canyon WSA demonstrates tall vegetation and light grazing practices. The riparian area portions of the WSA currently contained in the GMCA does not contain tall healthy vegetation. In addition WSA visitors to the area could consider these riparian systems to appear overgrazed. All these factors degrade the wilderness experience for WSA visitors.

B) Naturalness and Solitude Value

B1) Human Activity

Recreational activity within the GMCA portions of the WSA is low; however these areas do encompass main access routes to the Sweetwater River (the focal point of the WSA). It is predicted that the GMCA portion of the WSA receives approximately 75-150 recreational visits a year (May-November 15) the majority of these visits are by visitors passing through to get to other places within the WSA. When coupled with visitation associated with use supervision, management, and maintenance (approx. 25-75 visits) the area receives approximately 100-225 visits a year.

B2) Presence and Distribution of Wildlife

The wildlife habitat included in this part of the Sweetwater Canyon WSA is primarily upland, sagebrush steppe incised by Granite, Mormon, and Willow Creeks. As such, it is suitable habitat for sage-grouse nesting and brood rearing and raptor nesting. Potential habitat for the pygmy rabbit also exists in some areas. This entire portion of the WSA that falls within the GMCA is identified as crucial winter range for elk and the riparian areas along the above-mentioned creeks is identified as crucial winter range for moose.

There are currently no known threatened or endangered species or designated critical habitat known to occur in the WSA. Sage-grouse populations in the vicinity, as indicated by lek count, appear to have remained stable in recent years. Potential habitat for the persistent sepal yellowcress exists in the riparian areas although no extensive surveys for its presence have been conducted.

The 2006 big game population estimates developed by the Wyoming Game and Fish Department indicate that the antelope and mule deer populations for those herd areas that include the south side of the WSA are below management objective. Elk, however, are estimated to be substantially above population objective.

As discussed above an indicator to the naturalness and solitude value of wilderness is the presence and distribution of wildlife, conversely the enjoyment of the wildlife value in wilderness is believed to be degraded by livestock impacts. Johnson et al 1997 found that noticeable detractors to recreation experiences resulting from livestock include: manure in camp, livestock near streams and lakes, on or near trails, livestock congregation areas, and manure on trails. Visitors to the areas within the WSA currently contained within the GMCA experience these encounters with livestock on a moderate basis however; these encounters are typically forgotten as one travels from these areas to the less impacted core of the WSA.

B3) Facilities

Currently no recreation facilities exist within the WSA. A riparian fence was built in 1997 in order to provide the canyon with rest and allow for better facilitation of livestock grazing along the Sweetwater River. The fence was designed and constructed in a manner so as not to impair Congress' ability to designate the area as Wilderness, as a result it was sited in a manner that is not visually intrusive. The fence facilitated a five year rest period and more recently an annually controlled grazing period. The construction of the fence rapidly recovered vegetation resources and bank stability along the river. The improved functionality and vegetative recovery in the WSA marked an enhancement in naturalness values.

B4) Presence of Pristine Areas or Conditions

In the Sweetwater Canyon WSA the likelihood of pristine conditions increase as the recreationist/observer travels closer to the interior of the WSA. The physical and administrative recreation setting of the GMCA portion of the WSA indicate a middle country recreation setting while the social setting could be characterized as backcountry. This means that although the area may not possess the most pristine recreation setting character, it does represent an area where the character of recreation use is minimal. The visual resource in the area is nearly pristine with slight modifications from the riparian fence and obvious primitive roads. Based on the above characterizations; pristine areas or conditions are not present within the GMCA portion of the WSA, however, conditions here appear nearly natural and in character with the surrounding landscape.

C) Planning

C1) Existing plans and objectives

All pertinent existing plans for the Sweetwater Canyon WSA are listed in chapter one of this document. No additional area specific or WSA management plan exists for the WSA.

D) Primitive Recreation Values

D1) Type of recreation opportunities

The BLM land use planning handbook defines a recreation opportunity as: “favorable circumstances enabling visitors’ engagement in leisure activity to realize immediate psychological experiences and attain more lasting value and beneficial outcomes” (DOI 2005 pg. Glossary-6). The GMCA portion of the WSA facilitates the attainment of visitor outcomes similar to those documented for the entire allotment. Primary activities in this portion of the WSA are: driving for pleasure, wildlife viewing, hunting, and utilizing the available access to travel to the interior of the WSA to conduct several other sets of activities. The interior of the WSA provides opportunities for visitors to participate in water based activities in a back country setting. The setting provided in the canyon facilitates opportunities for visitors to realize unique (for lands in the Lander Field Office) experiences and benefits.

D2) Dependence of opportunities on a natural appearing environment

The opportunities available in the GMCA portion of the WSA are moderately dependent on a natural appearing environment. The existing slight modifications represent very light visual intrusions into the area and do not cause landscape segmentation (or islands of WSA surrounded by modern intrusions). The only current change to the natural appearing environment is the obvious primitive roads used for access as well as the riparian fence. Moderate changes (as measured by the BLM contrast ratings system) to the natural appearing environment (also known as the characteristic landscape) in this area, could cause degradation of recreation opportunities, and affect overall visitor impressions of the WSA as whole. Visitors who pass a moderate contrast while traveling through the periphery edges may reflect negatively on their entire experience despite the nearly natural appearing environment in the interior (the area within the canyon corridor) of the WSA. In addition opportunities available within the interior of the WSA are highly dependent on a natural appearing environment, therefore changes to the GMCA portion of the WSA that negatively affect the interior (visually or biologically) will degrade the opportunities (especially experiences and benefits) available within the entire WSA.

E) Special Features

E1) Special Features Value

The river canyon corridor and the surrounding riparian area constitute a special feature within the Sweetwater Canyon WSA. The geologic landforms and sharp canyon walls contrast with the surrounding landscape in a manner that adds visual appeal. The landscape contained within the core of the WSA is very unique viewshed to the Wyoming Basin physiographic province. The drastic change in the elevation and availability of water with the canyon corridor combine to provide a high level of biological diversity. The GMCA portion of the WSA does not include lands within the river canyon, however offsite impacts rendered in this area could alter the integrity of the special features discussed above.

F) Surface Water Quality

F1) Surface Water Quality Value

The WSA watershed contains medium textured soils which are commonly underlain by plutonic granitic rocks with mafic intrusions and there are common rock outcrop exposures. Mixed alluvium of many of these soils shows an influence from the local granite. Surface water runoff is generally rated as medium in the USDA Fremont County East Part and the Dubois Area Soil Survey, which means that the loss of water to overland flow does not reduce seriously the supply available for plant growth.

Elevations in this area range from 6,750 to a bit over 7600 feet NGVD. Slopes vary from nearly level to steep (0 to 65 percent slope). Soils are well-drained, very shallow (<10 inches) to moderately-deep (20 to 40 inches) and are loamy, or gravelly and loamy, in texture. These soils are mostly associated with hills, ridges, escarpments, fan aprons, and pediments. Besides the river corridor, there are numerous seeps and springs, and portions of several tributary streams. Water erosion is the dominant form of erosion in this area, though the high, flat upland portions of the WSA, above the Canyon, do exhibit wind scour in the bare soil patches in the short stature sagebrush

communities.

The Class 1 (most stringent standards) waters in the WSA are those portions of the Sweetwater River above its confluence with Alkali Creek and any tributaries that are not designated differently. Class 1 waters are those waters in which no further degradation of water quality will be allowed. The other streams in the WSA (Granite Creek, Willow Creek, Mormon Creek.....) are Class 2AB waters are those known to support game fish populations or spawning and nursery areas at least seasonally and all their perennial tributaries and adjacent wetlands and where a game fishery and drinking water use is otherwise attainable. All Class 2AB waters are designated as cold water game fisheries unless identified as a warm water game fishery by a “ww” notation in the “Wyoming Surface Water Classification List”. Unless it is shown otherwise, these waters are presumed to have sufficient water quality and quantity to support drinking water supplies and are protected for that use. Class 2AB waters are also protected for nongame fisheries, fish consumption, aquatic life other than fish, recreation, wildlife, industry, agriculture and scenic value uses.

G) Vegetation

G1) Ecological Site Inventory

There is no ecological site inventory as such for the Sweetwater Canyon WSA or surrounding lands. However, the 1979-1980 Green Mountain Weight Estimate Range Survey (GMWERS), our most recent and comprehensive data set for vegetation in the area, provides data that can be roughly compared to NRCS Ecological Site Guides and Draft State and Transition models. This data is only slightly valuable to the analysis of effects on the WSA because it only represents vegetative conditions from around the time of the approval of FLMPA and ten years prior to the recommendation of the WSA to Congress. The information does not represent the current condition as required by the Interim Management Policy for Lands Under Wilderness Review.

The 1979-1980 GMWERS provided data over large areas of vegetation types called Site Write-Up Areas or SWAs. The SWAs roughly correspond to ecological sites. The ecological sites which most closely match our SWAs are all 10-14 inch precipitation, High Plains Southeast. These ecological sites include Subirrigated, Loamy Overflow, Loamy, Shallow Loamy and Shallow Igneous. All sites were compared to the Historic Climax Plant Community Stable State and given a condition score based on that comparison. Sites were also compared to Wyoming NRCS Draft State and Transition models to determine if an alternate stable state could better describe the condition and if so, what the likely causal factors or triggers were. According to the National Weather Service Historical Climate Information, Western Regional Climate Center, South Pass City had 13.34 inches of precipitation in 1979. Therefore, productivity was compared to what would be expected in an average year given the condition or stable state.

For a quick overview of vegetative condition in the WSA see the table below. Current conditions as compared to these 28 year old findings will be addressed under Trend.

Table 3-29. Vegetative Condition in Sweetwater Canyon WSA

Ecological Site	% of total WSA acres (within GMCA)	Average Range Condition	% of Expected Productivity	Stable State	Causal Factors (Triggers) Leading to Stable State
Subirrigated	2%	Poor to Low Fair	57 -93%	Kentucky Bluegrass / Forbs	Heavy Continuous Season Long Grazing
Loamy Overflow	3%	Poor to Fair	32%	Western Wheatgrass / Short Bluegrass	Continuous Season Long Grazing
Loamy	59%	Fair to Low Good	30%	Big Sagebrush / Mid Grasses	Continuous Season Long Grazing
Shallow Loamy	36%	Low Fair	66%	n/a*	n/a*
Shallow Igneous	<1%	Low Fair	75%	Big Sagebrush / Rhizomatous Wheatgrass	Heavy Continuous Season Long Grazing

*The SWAs that matched with Shallow Loamy Ecological sites did not correspond well to any of the Stable States described.

G2) Trend From at Least Two Points in Time

Data collected in the 1958 Green Mountain Unit Range Survey can be compared with data from the 1979-1980 Weight Estimate Range Survey. This analysis utilizes portions of the two surveys specific to the WSA to assess vegetative trend. The most obvious comparison is in percent composition by growth form. Another comparison that can be made is in the kind of grass species that are found.

The data shows that there was a shift in plant composition from 1958 to 1970-1980. Bluegrasses were at 33% total composition in 1958 compared to 17% bluegrasses in 1970-1980. An average of 44% grasses, 29% forbs (73% total herbaceous) and 27% shrubs was recorded on upland sites in 1958. In 1979-1980 we find an average of 37% grasses, 12% forbs (49% total herbaceous) and 51% shrubs. We know from looking at State and Transition Models that continuous season long grazing creates a shift first toward bluegrasses then toward shrubs in upland plant communities. These changes represent a downward trend in range condition.

Since 1980, several apparent trend observations have been made by Lander Field Office personnel. These observations vary by location and year depending on proximity to water sources and annual soil moisture conditions. The following conclusions from the 1999 and 2002 Rangeland Health Standards Review are still valid today within the WSA:

- “The upland ecological (range) sites immediately adjacent to riparian areas are not meeting the standard. At the present time, this acreage has been estimated at 3-5 percent (15-25,000 acres) of the GMCA”.
- “Upland vegetation on most (61%) ecological (range) sites consists of plant communities which have deteriorated under past and current grazing management. These sites contain disproportionate amounts of increaser and invader plants which have lowered their resiliency, diversity, and ability to recover from natural and human disturbance. Of the sites within Fremont County, current forage production is approximately 43 percent of their potential production based on the 1993 East Fremont County Soil Survey”.

G3) Utilization by Key Species

No utilization data by key species is available for the WSA. However, utilization at riparian key areas near the WSA ranged from 65 to 85 percent in 2007.

Prescribed use levels are below the threshold for maximum allowable impacts. Prescribed use levels are often exceeded in practice (65 to 85 percent) and therefore to comply with this requirement of the IMP, actual utilization would need to be brought in line with prescribed utilization.

G4) Threatened or endangered plants

There are no known occurrences of any threatened or endangered plant or suitable habitat for any such plant in the Sweetwater Canyon WSA.

G5) Plant Vigor

Plant vigor has been suppressed since the drought began in 2000. In 2003 and 2005 moisture conditions temporarily improved and allowed for near average vegetative production. However, recent field observations continue to show that the height and volume of plant growth has been reduced due to limited soil moisture conditions and heavy grazing on and adjacent to riparian areas.

G6) Actual use and preference

The historical authorized livestock use for GMCA from 1980 through 2006 has averaged 23,811 AUMs which is 50 percent of the permitted 47,361 AUMs. Recent actual livestock grazing use from 1999 through 2006 has averaged 17,370 AUMs which is approximately 37 percent of the permitted 47,361 AUMs. These historical authorized and recent actual use levels approximate to 7,500 AUMs and 5,540 AUMs respectively, for those that have occurred on the Granite Creek-Rocks Pasture which includes the WSA.

G7) Climate and Precipitation

The bulk of annual precipitation occurs in the spring; typically beginning in late March, peaking in May, and declining rapidly during June. A minor, but important second peak occurs during the fall period, September through November. This fall moisture can initiate a second period of growth for cool-season grasses, but more importantly it will insure a good frost seal for the soils so that they are pre-wetted and ready to transmit spring precipitation deep into the soil profile for use by the deeper-rooted more desirable native grasses and shrubs.

The annual precipitation in this part of the allotment is 10 to 14 inches, but effective precipitation is lower due to desiccating winds, and the growing season is short with 60-90 days frost-free.

Wyoming averages severe or extreme drought conditions from 10 % in the eastern plains to more than 20 % of the time over the southwest regions of the state. These percentages are nearly doubled if all drought levels are considered (mild to exceptional).... Between 31% and 45% of the time a meteorological drought is occurring within a climate division and generally between 80% and 90% of the time these events last no longer than 6 months, although below normal precipitation has been known to last up to 16 straight months. All climate divisions having a monthly precipitation deficit at the same time occur about 17% of the time during any dry or wet season. While entire years have precipitation deficits, it is rare that every month during that year has below normal precipitation. Widespread droughts in Wyoming, as determined from stream flow records, were most notable during three periods: 1929-1942, 1948- 1962, and 1976-1982 (page 96 of the Wyoming Climate Atlas).

G8) Historic and Existing Range Management Practices.

The GMCA is a common use allotment covering approximately 522,000 acres in southern Fremont County and portions of Sweetwater County. Sixteen individuals share livestock grazing use within the allotment on 19 grazing permits. Prior to 1999, grazing management in the WSA was continuous-season long grazing primarily from cattle. This grazing occurred from May 1 until November 1 each year. Occasionally, some sheep grazing occurred within the canyon. Prescribed grazing management systems were not in place until 1997. Since 1999, the prescribed grazing has been deferred-rotation management on the portion of the WSA outside of the riparian management fence (South Sweetwater Fence). Monitoring studies were established in the canyon beginning in 1997. There are no monitoring studies established on the 1900 acres within the GMCA.

In 1996, the BLM initiated a large-scale planning effort involving the general public, local government, special

interest groups, and permittees to address the varied and sometimes conflicting uses of the GMCA. This planning effort considered requests to convert the remaining sheep grazing use to cattle grazing and was intended to mitigate the known resource conflicts within the allotment. The planning effort identified a number of management issues and developed a list of goals and objectives to resolve the issues. An analysis documented in an EA (No. WY-050-EA9-039) resulted in the BLM's August 31, 1999 decision for managing livestock grazing on the Green Mountain Common Allotment.

H) Wildlife Value

H1) Threatened or endangered animals

There are no documented occurrences of any federally-listed, threatened or endangered animal species in the Sweetwater Canyon WSA. Suitable habitat exists for the gray wolf but no occupancy has been established to date.

H2) Wildlife populations

Apart from estimated big game populations for a much larger area, no wildlife population data exists for species within the WSA.

H3) Population estimates

For the herd management areas in which the WSA lies, antelope and mule deer populations are currently estimated by the Wyoming Game and Fish Department to be below objective and elk is estimated to be above.

H4) Diversity

Plant and animal species diversity data is not available for the WSA but diversity of habitat type, ranging from riparian to upland sagebrush steppe, suggests that species diversity would be similar to that found in other parts of the GMCA.

Conclusion:

Table 3-30 shows those WSA values that (based on the affected environment discussion above) are not known to exist in the Sweetwater Canyon WSA or values that will not be affected as a result of actions authorized for the GMCA AMP.

Table 3-30. WSA Values Not Occurring In Sweetwater Canyon WSA

WILDERNESS VALUE	JUSTIFICATION
B) Naturalness and Solitude	
B3) Facilities	No new facilities (other than those discussed under the WSA impacts common to all section) are proposed for lands contained within the WSA.
B4) Presence of Pristine Areas or Conditions	No pristine areas are known to exist in the GMCA portion of the WSA and no offsite or indirect impacts are anticipated to these areas that may exist in the interior of the WSA.
C1) Planning	All alternatives are in conformance with existing land use plans and applicable activity plans.
G) Vegetation	
G4) Threatened or Endangered Plants	No known Threatened or Endangered plants exist within the WSA.
H) Wildlife	
H1) Threatened or Endangered animals	No known Threatened or Endangered animals exist within the WSA.

OPEN SPACE

Open space is defined in the Wyoming Open Spaces Initiative Terminology Database as (1) an area of natural landscape essentially undeveloped, such as ridges, streams, natural shorelines, scenic buffer areas, and agricultural lands, or (2) public tracts which are dedicated primarily to pedestrian use, excluding thoroughfare right-of-ways.

In another definition from the Wyoming Open Spaces Initiative, open space is that quality of place that provides people with a sense of freedom; land largely free of residential and industrial development; land which maintains rural character, wildlife habitat, impressive viewscapes, and access to recreation; or land which is in agricultural use, such as ranching or farming.

The treatment of the “open space” issue in the Green Mountain Common Allotment contains an inherently contradictory situation. On the one hand, the existence of open space on private property in the planning area around Green Mountain depends on the continued existence of agricultural lands. According to Taylor (2003) the future of open spaces in Wyoming will depend to a large extent on what happens to agriculture, and whether privately-owned agricultural lands are retained. Factors potentially affecting the retention of agricultural land in Wyoming, according to Taylor, include the aging of Wyoming agricultural operators; the current limited profitability of Wyoming agriculture and/or the availability of higher profits from other lands uses, especially development; the increase in agricultural land prices despite the limited profitability of agriculture; and continued uncertainty about livestock grazing on federal lands.

The continued operation of private agricultural lands appears to depend in no small part on the availability of public lands for grazing, freeing up the home ranch to grow the feed that will sustain livestock during the winter months when grazing is not available.

Indeed, due to a variety of factors including some mentioned by Taylor (the aging of agricultural operators, the limited profitability of agriculture, and the rising cost of fuel and labor) the Green Mountain permittees believe that their financial success depends on the development of fencing and water projects on the Green Mountain Common Allotment. The contradiction within idea is that if fencing and developing the Green Mountain Common Allotment is truly required for the financial success of livestock operators, and their ability to retain private lands in open space, then the protection of open space in one area (private agriculture) will reduce open space in another (on the allotment).

The importance of open space to the people of Wyoming was recently highlighted in the results of a statewide poll sponsored by the Ruckelshaus Institute, the Wyoming Stock Growers Association, and the Wyoming Chapter of The Nature Conservancy. In that poll, a total of 600 Wyoming voters were contacted in May 2007 and were asked to identify the most important conservation and development issues facing the state. The respondents viewed the availability of water, the loss of family farms and ranches, and the fragmentation of natural areas and ranch lands by development, as the most serious conservation issues facing the state. (Hulme, D.G., et al, 2008)

In the survey, 47 percent of Wyoming voters agreed that “loss of family farms and ranches” was an extremely or very serious problem. Forty-four and 31 percent of the respondents, respectively, said that “natural areas and ranch lands being split up by new housing development” and “natural areas and ranch lands being split up by oil and gas development” were also extremely or very serious problems. Among the top state-funded conservation priorities that Wyoming voters would be willing to pay for, the third highest on the list was “preserving wide open spaces and scenic vistas,” with 73 percent of respondents describing that as extremely or very important. The only funding priorities that were higher were (1) keeping more water in the state and (2) maintaining the strength of Wyoming’s agricultural and tourism industries.

On BLM-administered public lands, open space is affected by the number, length, location, and type of fences, whether permanent or temporary, which tend to segment and subdivide the land. Open space is also affected by surface disturbing activities, such as oil field development, mining activity, and the construction of pipelines, power lines, and roads.

In the Green Mountain Common Allotment, open space is reflected in the vastness of the largely undeveloped landscape. The free-roaming wild horse and wildlife populations, along with the large number of recreational choices, such as hunting, backpacking, exploring historic trails, and watching wild horses and wildlife, all create an environment that is increasingly rare throughout the west. The openness also helps maintain a diverse and healthy environment. For example, the lack of fencing allows wild horses to move among herd areas, contributing to the genetic health of the herds. Likewise, the unobstructed movement of big game animals, particularly in a north/south direction, allows the animals to reach critically important seasonal habitats, for forage and cover.

In the past, the BLM attempted to develop projects that were beneficial to livestock operations without significantly impacting open space and the natural character of the allotment. Even so, some individuals who favor recreation and wildlife interests contend that the construction of fences, like those in the Sweetwater Canyon and along Ice Slough, have reduced the open space character of the allotment.

Map 3-14, Known Fences Within the Lander Field Office, is an effective tool for visualizing the lack of fencing in the GMCA compared to other parts of the Lander Field Office. The scarcity of permanent fences within the allotment enables visitors to have relatively unencumbered cross country travel over great distances, by horseback and on foot. In Appendix 24, open space characteristics are evident in photographs taken along the Seminole Cutoff of the Oregon/Mormon/California/Pony Express National Historic Trails. In particular, the trail segment beginning slightly northeast of North Bear Mountain and ending at the Three Forks – Atlantic City Road possesses remarkable open space qualities being either untouched by, or with very few, modern intrusions. See photos 9, 10, 11, 12, 13, 14 and 15.

SOCIOECONOMICS

Study Region

BLM has the capacity, through its decision making responsibilities, to manage resource development in the planning area and influence not only the GMCA permittees but also the overall economy of the region. For the purposes of this analysis, the regional aspect will be Fremont County and will include the communities of Riverton, Lander and Jeffrey City.

The following section is designed to provide a summary of demographic and economic information that focuses on the study area, with the goal of providing the reader with an overall understanding of the historical and existing economic and social considerations. This information will then serve as a backdrop for the impact analysis presented in Chapter 4. The source for the data used in the preparation of this section will be referenced in footnotes to the tables and figures.

Economic Demographics and Activity

Population and Earnings

The population of the study area has grown from 28,406 in 1970 to an estimated 37,163 in July of 2006 (Table 3-31). That represents an increase of about 31% from 1970-2006. Over this time period, the largest increase occurred between 1970 and 1980 where the population increased by nearly 38%. However, the following decade (1980-1990) saw a decline in population of about 14% and then in the period from 1990 to 2000 the population grew almost 7%. And population has continued to grow through 2006 as shown by Table 3-32.

Table 3-31. Personal Income Trends in Fremont County

Line Title - Fremont County	1970¹	1980¹	1990¹	2000¹	2005¹	7/1/2006²
Personal income (\$000)	\$90,911	\$379,991	\$463,210	\$828,792	\$1,065,378	
Population (persons) ²	28,406	39,071	33,565	35,848	36,580	37,163
Per capita personal income (dollars)	\$3,200	\$9,726	\$13,800	\$23,120	\$29,125	

¹Regional Economic Information System (REIS) 1969-2005

² Census Bureau midyear population estimates. Estimates for 2006 reflect county population estimates available as of March 2007

Table 3-32. Population Trends in Fremont County

Line Title - Fremont County	1970¹	1980¹	1990¹	2000¹	2005¹	7/1/2006³
Personal income (\$000) - 2006 dollars ³	\$472,362	\$929,687	\$714,485	\$970,293	\$1,099,745	
Population (persons) ²	28,406	39,071	33,565	35,848	36,580	37,163
Per capita personal income (2006 dollars)	\$16,629	\$23,795	\$21,287	\$27,067	\$30,064	

¹Regional Economic Information System (REIS) 1969-2005

² Census Bureau midyear population estimates. 2006 county population estimates available March 2007

³ CPI, All Items, U.S. Department of Labor (Bureau of Labor Statistics)

Looking at the personal income for the period from 1970-2005 (Table 3-33) indicates that the per capita income measured in 2006 dollars has increased by nearly 81%. While it increased over this period, there were variations in the rate of change by decade. For example, per capita income, measured in 2006 dollars, grew by 43% from 1970-1980 and then actually went down by nearly 11% from 1980 to 1990. The following decade then saw an increase of slightly over 27% followed by an 11% increase from 2000 through 2005, which is only a five year period.

Table 3-33. Personal Income Trends in Fremont County (1970-2005).

Line Title - Fremont County	% Change '70-'80	% Change '80-'90	% Change '90-'00	% Change '00-'05	% Change '70-'05	% Change '05-'06	% Change '70-'06
Personal income (\$000) - 2006 dollars	96.82%	-23.15%	35.80%	13.34%	132.82%		
Population (persons) ²	37.54%	-14.09%	6.80%	2.04%	28.78%	1.59%	30.83%
Per capita personal income (2006 dollars)	43.09%	-10.54%	27.15%	11.07%	80.79%		

The distribution of earnings from 1970 to 2000 is shown in Table 3-34. Table 3-34 is then converted to 2006 dollars using the Consumer Price Index (CPI) and the results are illustrated in Table 3-35. And then Table 3-36 uses the data from Table 3-35 to show the proportion of earnings by sector. The result of these calculations reveals that mining's share of the total was the highest compared to all other sectors in 1970 and then dropped to about 6% by 2000. Farm earnings, on the other hand, accounted for nearly 5.6% in 1970 and by 2000 it had fallen to 1.44% of the total. And by 2000 Government and government enterprises share of total earnings was slightly over 29% and contributed the largest share of earnings compared to all other sectors in Fremont County.

Table 3-34. Distribution of Earning in Fremont County (1979-2000)

Line Title - Fremont County (\$000)¹	1970	1980	1990	2000
Farm earnings	\$4,333	\$2,271	\$9,034	\$7,297
Agricultural services, forestry, fishing & other 7/	\$533	\$808	\$1,616	\$2,590
Mining	\$17,644	\$119,651	\$23,760	\$30,798
Construction	\$10,336	\$28,254	\$23,288	\$55,415
Manufacturing	\$4,487	\$11,450	\$13,366	\$32,957
Transportation and public utilities	\$3,830	\$16,446	\$23,570	\$33,424
Wholesale trade	\$1,499	\$8,142	\$8,693	\$10,565
Retail trade	\$8,970	\$32,314	\$35,522	\$57,077
Finance, insurance, and real estate	\$1,947	\$7,406	\$6,492	\$17,658
Services	\$8,478	\$43,251	\$63,035	\$111,574
Government and government enterprises	\$15,620	\$51,944	\$101,568	\$148,087
Total	\$77,677	\$321,937	\$309,944	\$507,442

Table 3-35. Distribution of Income for Fremont County using 2006 dollars

Line Title - Fremont County (\$000 - 2006\$)²	1970	1980	1990	2000
Farm earnings	\$22,514	\$5,556	\$13,935	\$8,543
Agricultural services, forestry, fishing & other	\$2,769	\$1,977	\$2,493	\$3,032
Mining	\$91,676	\$292,738	\$36,649	\$36,056
Construction	\$53,705	\$69,126	\$35,921	\$64,876
Manufacturing	\$23,314	\$28,014	\$20,617	\$38,584
Transportation and public utilities	\$19,900	\$40,237	\$36,356	\$39,131
Wholesale trade	\$7,789	\$19,920	\$13,409	\$12,369
Retail trade	\$46,607	\$79,059	\$54,791	\$66,822
Finance, insurance, and real estate	\$10,116	\$18,120	\$10,014	\$20,673
Services	\$44,051	\$105,818	\$97,229	\$130,623
Government and government enterprises	\$81,160	\$127,086	\$156,665	\$173,370
Total	\$403,600	\$787,652	\$478,077	\$594,078

¹Regional Economic Information System (REIS), Bureau of Economic Analysis (BEA), RCN-0852, May 2007

²CPI, All Items, U.S. Department of Labor (Bureau of Labor Statistics)

Table 3-36. Proportion of Earnings in Fremont County by Sectors

Line Title - Fremont County (% of Total)	1970	1980	1990	2000
Farm earnings	5.58%	0.71%	2.91%	1.44%
Agricultural services, forestry, fishing & other	0.69%	0.25%	0.52%	0.51%
Mining	22.71%	37.17%	7.67%	6.07%
Construction	13.31%	8.78%	7.51%	10.92%
Manufacturing	5.78%	3.56%	4.31%	6.49%
Transportation and public utilities	4.93%	5.11%	7.60%	6.59%
Wholesale trade	1.93%	2.53%	2.80%	2.08%
Retail trade	11.55%	10.04%	11.46%	11.25%
Finance, insurance, and real estate	2.51%	2.30%	2.09%	3.48%
Services	10.91%	13.43%	20.34%	21.99%
Government and government enterprises	20.11%	16.13%	32.77%	29.18%
Total	100.00%	100.00%	100.00%	100.00%

The definition of sectors used by the BEA changed in 2001. Prior to that time, they used the Standard Industrial Classification (SIC) for defining the economic sectors. Since 2001 they are using a new classification system for defining the economic sectors, which is called the 2002 North American Industry Classification System (NAICS). These two classification systems are not interchangeable so the Fremont County earnings data for 2005 is split out and shown in Tables 3-37 and 3-38.

Table 3-37. Earnings Data for Fremont County (2005)

Line Title - Fremont County (\$000)¹	2005
Farm earnings	10,831
Forestry, fishing, related activities, and other	2,584
Mining	52,893
Construction	53,621
Manufacturing	14,693
Retail Trade	54,225
Transportation and warehousing	20,738
Information	11,610
Finance and insurance	14,156
Real estate and rental and leasing	16,182
Professional and technical services	27,121
Management of companies and enterprises	971
Administrative and waste services	7,013
Arts, entertainment, and recreation	11,889
Accommodation and food services	22,956
Other services, except public administration	21,519
Other (Utilities, Wholesale Trade, Educational services, Health care and social assistance)	95,969
Government and government enterprises	212,964
Total	651,935

Table 3-38. Fremont County Earnings Data

Line Title - Fremont County (\$000 - 2006\$)²	2005
Farm earnings	\$11,180
Forestry, fishing, related activities, and other	\$2,667
Mining	\$54,599
Construction	\$55,351
Manufacturing	\$15,167
Retail Trade	\$55,974
Transportation and warehousing	\$21,407
Information	\$11,985
Finance and insurance	\$14,613
Real estate and rental and leasing	\$16,704
Professional and technical services	\$27,996
Management of companies and enterprises	\$1,002
Administrative and waste services	\$7,239
Arts, entertainment, and recreation	\$12,273
Accommodation and food services	\$23,697
Other services, except public administration	\$22,213
Other (Utilities, Wholesale Trade, Educational services, Health care and social assistance)	\$99,065
Government and government enterprises	\$219,834
Total	\$672,965

¹Regional Economic Information System (REIS), Bureau of Economic Analysis (BEA), RCN-0852, May 2007
²CPI, All Items, U.S. Department of Labor (Bureau of Labor Statistics)

Table 3-39 indicates farm earnings contributed 1.66% of total earnings in 2005. This is up from the 1.44% reported in 2000. But as mentioned above, in 2000 the SIC was used and in 2005 NAICS was used to define the sectors. So the 2000 data in Table 3-36 is not directly comparable to the data illustrated in Table 3-39. It is also noteworthy to point out that government and government enterprises has been the largest contributor to Fremont County earnings since 1990 as shown by both Tables 3-36 and 3-39.

Table 3-39. Total Earning by Sector in Fremont County

Line Title - Fremont County (% of Total)	2005
Farm earnings	1.66%
Forestry, fishing, related activities, and other	0.40%
Mining	8.11%
Construction	8.22%
Manufacturing	2.25%
Retail Trade	8.32%
Transportation and warehousing	3.18%
Information	1.78%
Finance and insurance	2.17%
Real estate and rental and leasing	2.48%
Professional and technical services	4.16%
Management of companies and enterprises	0.15%
Administrative and waste services	1.08%
Arts, entertainment, and recreation	1.82%
Accommodation and food services	3.52%
Other services, except public administration	3.30%
Other (Utilities, Wholesale Trade, Educational services, Health care and social assistance)	14.72%
Government and government enterprises	32.67%
Total	100.00%

Table 3-40 examines the change occurring in farm and nonfarm earnings over the 1970-2005 period. During this timeframe, Farm earnings declined by about 75% from 1970-1980 and then grew by nearly 150% from 1980-1990. It then declined by almost 39% from 1990-2000, grew by nearly 31% from 2000-2005, but has declined by over 50% from 1970 through 2005. Contrasted to farm earnings, nonfarm earnings grew 105% from 1970 to 1980, declined by almost 41% over the next decade, increased by slightly over 26% and during the period from 2000-2005 grew by about 13%. Overall, nonfarm earnings grew by almost 74% from 1970 to 2005.

The growth in non-earned income, which is also often referred to as non-labor income (dividends interest and rent) and transfer payments (payments from governments to individuals such as Medicare, Social Security, unemployment compensation, disability insurance payments and welfare) is becoming an increasingly important source of income throughout the west. As such, it is an important indicator of the changing economies in amenity areas like Fremont County. And based on the desirability of Fremont’s location within the state of Wyoming, one would expect a sizable growth in non earned income. Therefore, for the purposes of this analysis, non earned income was tracked using data from the Economic Profile System (EPS) for Fremont County produced by Headwaters Economics (see www.headwaterseconomics.org).

Table 3-40. Change in Farm and Non-farm Earning in Fremont County (1970-2005)

Line Title - Fremont County (\$000)	1970	1980	1990	2000	2005
Farm earnings	\$4,333	\$2,271	\$9,034	\$7,297	\$10,831
Nonfarm earnings	\$73,344	\$319,666	\$300,910	\$500,145	\$641,104
Total	\$77,677	\$321,937	\$309,944	\$507,442	\$651,935

Line Title - Fremont County (\$000 - 2006\$)	1970	1980	1990	2000	2005
Farm earnings	\$22,514	\$5,556	\$13,935	\$8,543	\$11,180
Nonfarm earnings	\$381,086	\$782,095	\$464,143	\$585,536	\$661,785
	\$403,600	\$787,652	\$478,077	\$594,078	\$672,965

	% Change '70-'05	% Change '70-'80	% Change '80-'90	% Change '90-'00	% Change '00-'05	% Change '70-'05
Farm earnings	-75.32%	150.79%	-38.69%	30.87%	-50.34%	
Nonfarm earnings	105.23%	-40.65%	26.15%	13.02%	73.66%	
Total	95.16%	-39.30%	24.26%	13.28%	66.74%	

Table 3-41 shows the relationship between total personal income and non-labor income for the period beginning in 1970 and extending through 2005. During this time, labor sources of income fell from about 79% of total personal income in 1970 to about 56.5% of total personal income in 2005. However, over this same timeframe, non-labor income went from slightly over 21% of total personal income in 1970 to nearly 43.6% in 2005, which indicates a growing importance of non-earned income in Fremont County.

To further point out the growing importance of non-earned income in Fremont County, total personal income grew by almost 133% from 1970 to 2005. By contrast, non-earned income grew by almost 379.5% during this same time period. So even though total personal income measured in 2005 dollars grew over this 25 year period, the growth in non-earned income outpaced it.

Table 3-41. Relationship Between Total Personal Income and Non-labor Income (1970-2005)

Line Title - Fremont County (\$000 - 2005\$) ¹	1970	1970% of Total	1995	1995% of Total	2005	2005% of Total
Total Personal Income	\$458	100.00%	\$786	100.00%	\$1,065	100.00%
Labor Sources	\$361	78.84%	\$447	56.82%	\$601	56.42%
Non-Labor Sources	\$97	21.16%	\$339	43.18%	\$464	43.58%
<i>Dividends, Interest and Rent</i>	\$61	13.30%	\$176	22.35%	\$239	22.39%
<i>Personal current transfer receipts</i>	\$36	7.87%	\$164	20.82%	\$226	21.19%

¹A Socioeconomic Profile, Fremont County, Headwaters Economics, p. 10

Figure 3-7 further illustrates the importance of non-earned labor income in Fremont County from 1970 to 2005 by illustrating the percentage of total personal income of both labor and non-labor income sources over this same timeframe. By examining Figure 1, one can see that the labor income fell from about 79% of total personal income in 1970 to about 56.5% of total personal income in 2005. But over this same period, non-labor income rose from slightly over 21% of total personal income in 1970 to over 43.5% of total personal income in 2005.

Figure 3-7. Importance of Non-Labor Income in Fremont County

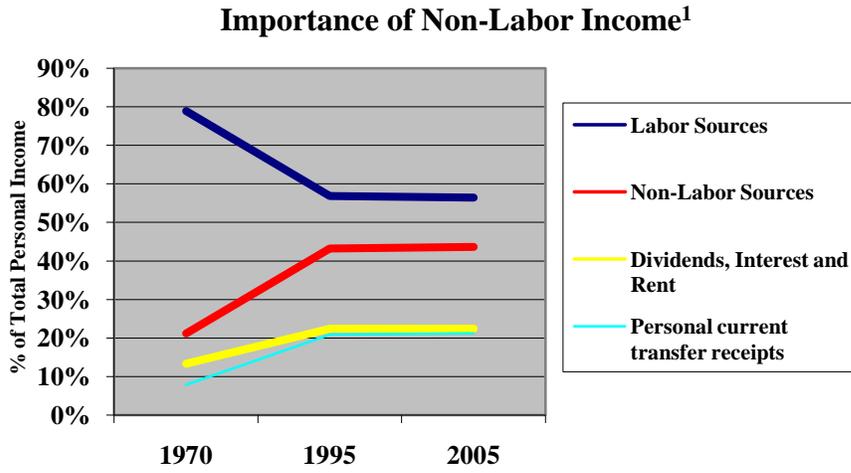
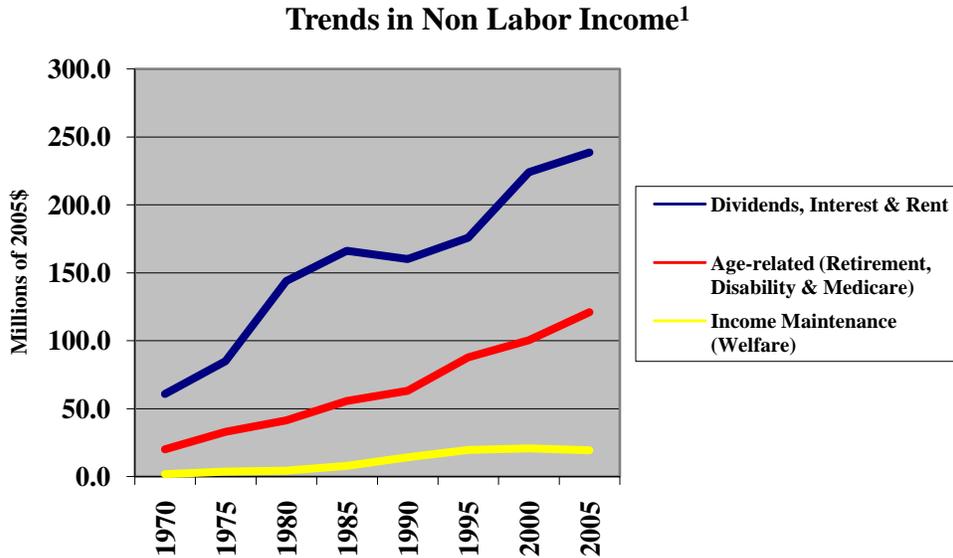


Figure 3-8 shows the trends in non labor income from 1970 to 2005. And during this time, non labor income has showed continued growth. In fact, dividends, interest & rent has grown by slightly over 292% over this timeframe. Retirement, disability & Medicare and welfare have grown by nearly 502% and slightly less than 926%, respectively, over this same period.

Figure 3-8. Trends in Non-Labor Income for Fremont County



¹A Socioeconomic Profile, Fremont County, Headwaters Economics, p: 10

Recreation

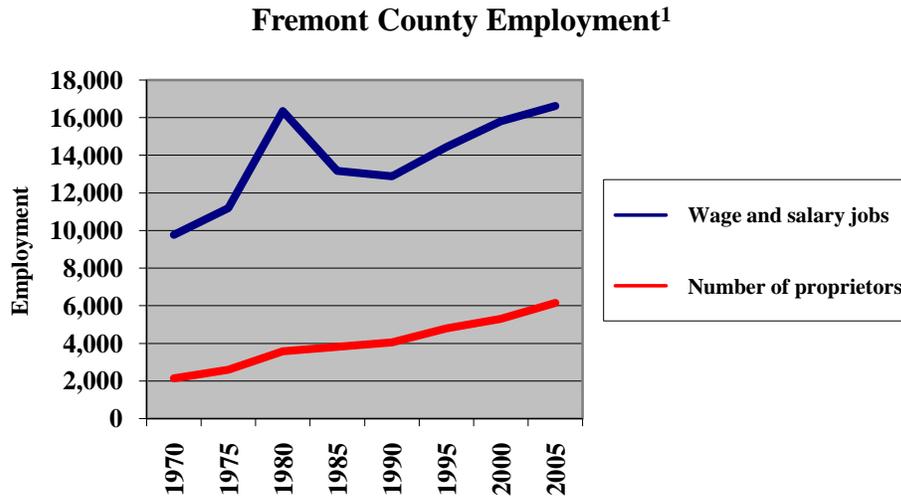
Recreation from the GMCA is also an important contributor to the study region. Based on the benefit cost analysis produced for this document, consumptive and non-consumptive use from the GMCA would annually account for about \$315,000 and \$83,000 respectively in direct expenditures in 2008 measured in 2006 dollars. And based on this analysis, one could conclude that the current annual direct recreation expenditures measured in 2006 dollars would be a little under \$400,000. As a note, this only includes the direct expenditures and does not include the indirect and induced affect that will be analyzed by alternative in Chapter 4 for each of the management alternatives.

Employment

Employment for both wage and salary jobs and the number of proprietors has grown in Fremont County from 1970 to 2005. But the growth has been uneven as shown in Figure 3-9 where wage and salary employment grew by a little over 14.5% from 1970 to 1975 and that growth rate increased to over 46% from 1975-1980 and then declined by almost 20% from 1980 to 1985. Examining the data more closely reveals that the change in wage and salary jobs continued its slide from 1985 to 1987 and over the period of 1985 to 1990 declined a little over 2%. But since 1987, wage and salary jobs have been increasing. And for the period from 1970 to 2005, they have increased by slightly over 70%.

Figure 3-9 also shows the number of proprietors from 1970 to 2005. Contrasted to the growth rate of wage and salary jobs, the number of proprietors continued to grow throughout the period without the major fluctuations displayed by the wage and salary jobs even though there were a few years where there was a decline in the number of proprietors. But each 5 year period beginning in 1970 through 2005 was marked by an increased number of proprietors and overall saw an increase of almost 187%. But it should be noted that in 1970 the number of proprietors constituted about 18% of the total number of jobs and by 2005 that number had increased to almost 27%.

Figure 3-9. Fremont County Employment Numbers (1970-2005)



¹A Socioeconomic Profile, Fremont County, Headwaters Economics, p: 6

Livestock Grazing

The majority of permittees have a long history of grazing domestic livestock in the GMCA and their average use is shown in Table 3-42. It should be noted that many of these operators have structured their operations around grazing on public land. Therefore, changes in the grazing systems that would come about as a result of the management alternatives being analyzed in this EA has the potential to impact their overall operation and also affect their cash flows. But the affect on the operator’s cash flows would depend on whether or not the proposed changes represent a change in use that is different than the historical average use over the last 26 years.

Table 3-42. Percentage of Actual Use by Cattle and Sheep Permittees on the GMCA (1980-2006)

Year	Authorized Active Use	Permitted Use	% of Permitted Use	Authorized Active Cattle Use	Permitted Cattle Use	% of Cattle Permitted Use	Authorized Active Sheep Use	Permitted Sheep Use	% of Sheep Permitted Use
1980	20,814	48,174	43.2%	12,136	36,223	33.5%	8,678	11,951	72.6%
1981	28,224	48,174	58.6%	16,988	36,223	46.9%	11,236	11,951	94.0%
1982	28,953	48,115	60.2%	21,472	36,164	59.4%	7,481	11,951	62.6%
1983	23,563	48,115	49.0%	15,780	36,026	43.8%	7,783	12,089	64.4%
1984	26,990	48,083	56.1%	17,045	35,749	47.7%	9,945	12,334	80.6%
1985	16,225	47,995	33.8%	6,280	35,454	17.7%	9,945	12,541	79.3%
1986	21,263	47,722	44.6%	10,626	35,193	30.2%	10,637	12,529	84.9%
1987	27,789	47,922	58.0%	17,843	35,193	50.7%	9,946	12,729	78.1%
1988	21,453	47,922	44.8%	11,315	35,193	32.2%	10,138	12,729	79.6%
1989	33,353	47,922	69.6%	23,191	35,193	65.9%	10,162	12,729	79.8%
1990	27,016	47,922	56.4%	16,881	35,693	47.3%	10,135	12,229	82.9%
1991	29,069	47,723	60.9%	20,436	35,910	56.9%	8,633	11,813	73.1%
1992	29,222	47,723	61.2%	19,088	35,910	53.2%	10,134	11,813	85.8%
1993	33,885	47,723	71.0%	23,752	35,910	66.1%	10,133	11,813	85.8%
1994	34,903	47,723	73.1%	24,769	35,910	69.0%	10,134	11,813	85.8%
1995	24,144	47,723	50.6%	24,144	35,910	67.2%	0	11,813	0.0%
1996	23,333	47,723	48.9%	23,333	35,910	65.0%	0	11,813	0.0%
1997	24,888	47,723	52.2%	24,078	35,910	67.1%	810	11,813	6.9%
1998	28,844	47,361	60.9%	28,535	35,910	79.5%	309	11,451	2.7%
1999	28,160	47,361	59.5%	22,736	35,910	63.3%	5,424	11,451	47.4%
2000	31,457	47,361	66.4%	25,634	35,910	71.4%	5,823	11,451	50.9%
2001	18,872	47,361	39.8%	14,235	35,910	39.6%	4,637	11,451	40.5%
2002	7,735	47,361	16.3%	6,585	35,910	18.3%	1,150	11,451	10.0%
2003	7,747	47,361	16.4%	6,312	35,910	17.6%	1,435	11,451	12.5%
2004	13,111	47,361	27.7%	11,385	35,910	31.7%	1,726	11,451	15.1%
2005	16,727	47,361	35.3%	12,731	35,910	35.5%	3,996	11,451	34.9%
2006	15,152	47,361	32.0%	11,516	35,910	32.1%	3,636	11,451	31.8%

Table 3-43 is interesting in that it depicts the percentage of permitted use from 1980 through 2006 for both cattle and sheep. During this timeframe there were periods of drought and also periods that more closely represent the long term climatic conditions for the area. Based on discussions with the Lander Field Office, the permittees have suggested the period from 1980-1998 more closely represents the “normal” climatic conditions for the GMCA. And the period from 1999-2006 was marked by a drought. So one would expect authorized use to fall off during the drought, which is reflected in Table 3-42.

Table 3-43. Percentage of Permitted Use on the GMCA (1980-2006)

Item	'80-'98	'99-'06	'80-'06
Cattle			
<i>Average Authorized Use</i>	18,826	13,892	17,364
<i>Average Permitted Use</i>	35,768	35,910	35,810
<i>Average % of Permitted Use</i>	52.6%	38.7%	48.5%
Sheep			
<i>Average Authorized Use</i>	7,697	3,478	6,447
<i>Average Permitted Use</i>	12,100	11,451	11,908
<i>Average % of Permitted Use</i>	63.1%	30.4%	53.4%
Total			
<i>Average Authorized Use</i>	26,523	17,370	23,811
<i>Average Permitted Use</i>	47,868	47,361	47,718
<i>Average % of Permitted Use</i>	55.4%	36.7%	49.9%

The average percentage of permitted use for cattle varies from 52.6% over the period from 1980 to 1998 to 38.7% from 1999-2006. As expected, the lowest average percentage of permitted use was 38.7% and occurred from 1999-2006, which was marked by a drought. The overall average percentage of cattle permitted use for the 26 year period from 1980-2006 is 48.5%.

Sheep average percentage of permitted use was 63.1% from 1980-1998 and dropped to 30.4% of permitted use during the drought period from 1999-2006. Overall, the average percent of sheep permitted use from 1980 through 2006 was 53.4%.

Looking at the total average percentage of permitted use, Table 3-43 indicates the average percentage of permitted use was 55.4% from 1980-1998 and then it fell to 36.7% during the drought from 1999-2006. And the overall average percentage of both cattle and sheep for the 26 year period from 1980 through 2006 was 49.9%. Therefore, overall, the permittees in GMCA averaged about 50 percent of permitted use over the 26 year period from 1980 to 2006.

Tax Revenues

Economic activities on BLM-administered land and mineral estate contribute to the fiscal well-being of local governments, as well as the state and federal governments. The BLM management actions have the potential to affect tax revenues across economic sectors. The following tables are presented to illustrate how Fremont County compares to the rest of the state regarding the assessed valuations and taxes collected statewide.

The data in Table 3-44 illustrates the locally assessed agricultural lands by type of use by county. Table 3-45 shows the total locally assessed valuation by county in conjunction with the components making up that total. The total of all state assessed property is then shown in Table 3-46. The percent of total range lands valuation depicted in Table 3-44 is computed based on both the total locally and state assessed valuation for 2007. The results of that computation is illustrated in Table 3-47, which depicts the relative importance of the assessed valuations of range lands compared to the total locally and state assessed valuation of each county and for the state of Wyoming. But it should be noted that even though the assessed valuation of range lands are relatively low when compared to the local, state and total valuations (Table 3-47), it can be argued that the amount of infrastructure and services required to support these lands are also relatively low.

Table 3-44. Locally Assessed Agricultural Land by Type of Use and County

	Total Irrigated Lands ¹		Total Dry Farm ¹		Total Range Lands ¹		Total Agricultural Lands ¹	
	Acres	Valuation	Acres	Valuation	Acres	Valuation	Acres	Valuation
Albany	74,964	\$1,615,273	0	\$0	1,644,243	\$5,179,463	1,719,207	\$6,794,736
Big Horn	111,421	\$10,537,434	62	\$1,048	201,788	\$1,571,726	313,271	\$12,110,208
Campbell	157	\$12,889	81,187	\$1,240,225	2,091,007	\$6,318,984	2,172,351	\$7,572,098
Carbon	138,363	\$4,312,565	10,059	\$137,535	1,775,926	\$4,045,465	1,924,348	\$8,495,565
Converse	42,736	\$3,336,103	5,826	\$93,271	1,872,111	\$6,653,130	1,920,673	\$10,082,504
Crook	4,044	\$308,927	133,178	\$1,890,702	1,233,129	\$7,424,778	1,370,351	\$9,624,407
Fremont	124,129	\$7,921,789	0	\$0	620,791	\$2,697,591	744,920	\$10,619,380
Goshen	112,160	\$9,638,003	165,322	\$2,361,862	991,950	\$6,235,838	1,269,432	\$18,235,703
Hot Springs	24,265	\$1,808,430	0	\$0	363,821	\$1,244,441	388,086	\$3,052,871
Johnson	83,519	\$7,855,460	2,400	\$32,971	1,778,535	\$7,832,700	1,864,454	\$15,721,131
Laramie	37,032	\$3,009,157	262,648	\$4,174,238	1,075,897	\$5,816,471	1,375,577	\$12,999,866
Lincoln	78,523	\$4,343,625	18,757	\$294,101	416,445	\$1,606,876	513,725	\$6,244,602
Natrona	25,172	\$2,083,916	1,064	\$16,951	1,279,816	\$3,943,448	1,306,052	\$6,044,315
Niobrara	11,369	\$716,607	35,868	\$522,416	1,315,844	\$4,775,450	1,363,081	\$6,014,473
Park	112,134	\$10,222,746	98	\$1,127	561,010	\$2,585,804	673,242	\$12,809,677
Platte	75,394	\$5,471,660	90,476	\$1,349,871	841,425	\$2,953,834	1,007,295	\$9,775,365
Sheridan	64,372	\$5,384,737	26,200	\$392,533	897,239	\$4,631,236	987,811	\$10,408,506
Sublette	133,549	\$2,968,810	0	\$0	412,525	\$3,170,288	546,074	\$6,139,098
Sweetwater	23,121	\$986,062	0	\$0	1,702,407	\$3,365,557	1,725,528	\$4,351,619
Teton	13,436	\$807,193	4,390	\$85,050	17,178	\$435,308	35,004	\$1,327,551
Unita	74,344	\$2,967,476	0	\$0	644,118	\$2,075,584	718,462	\$5,043,060
Washakie	43,842	\$4,497,341	2,827	\$35,706	302,135	\$1,465,264	348,804	\$5,998,311
Weston	2,949	\$82,408	31,685	\$441,388	1,010,961	\$3,418,252	1,045,595	\$3,942,048
Totals	1,410,995	\$90,888,611	872,047	\$13,070,995	23,050,301	\$89,447,488	25,333,343	\$193,407,094

Table 3-45. Total Locally Assessed Valuation by County

	Total Agricultural Land Valuation¹	Total Residential Land, Improvements & Personal Property¹	Total Commercial Land, Improvements & Personal Property¹	Total Industrial Property¹	Total Locally Assessed¹
Albany	\$6,794,736	\$189,060,881	\$60,950,461	\$7,046,558	\$263,852,636
Big Horn	\$12,110,208	\$38,843,427	\$10,004,460	\$10,910,623	\$71,868,718
Campbell	\$7,572,098	\$139,616,343	\$60,299,007	\$354,162,816	\$561,650,264
Carbon	\$8,495,565	\$63,398,551	\$18,389,354	\$65,834,235	\$156,117,705
Converse	\$10,082,504	\$59,845,975	\$13,872,388	\$48,081,944	\$131,882,811
Crook	\$9,624,407	\$27,310,909	\$6,194,040	\$7,287,769	\$50,417,125
Fremont	\$10,619,380	\$175,450,198	\$43,618,978	\$73,743,651	\$303,432,207
Goshen	\$18,235,703	\$50,882,916	\$11,839,550	\$3,349,467	\$84,307,636
Hot Springs	\$3,052,871	\$19,800,130	\$5,429,865	\$6,100,008	\$34,382,874
Johnson	\$15,721,131	\$76,562,127	\$12,039,714	\$41,922,787	\$146,245,759
Laramie	\$12,999,866	\$486,263,416	\$153,951,315	\$43,833,935	\$697,048,532
Lincoln	\$6,244,602	\$140,205,135	\$21,159,686	\$131,911,315	\$299,520,738
Natrona	\$6,044,315	\$385,698,540	\$142,967,781	\$54,316,636	\$589,027,272
Niobrara	\$6,014,473	\$8,088,468	\$2,541,361	\$1,769,463	\$18,413,765
Park	\$12,809,677	\$209,905,147	\$47,660,652	\$16,363,405	\$286,738,881
Platte	\$9,775,365	\$37,393,433	\$9,925,334	\$1,376,490	\$58,470,622
Sheridan	\$10,408,506	\$226,115,139	\$48,014,870	\$29,380,769	\$313,919,284
Sublette	\$6,139,098	\$113,466,778	\$24,603,585	\$144,817,853	\$289,027,314
Sweetwater	\$4,351,619	\$169,796,990	\$51,271,170	\$246,714,241	\$472,134,020
Teton	\$1,327,551	\$856,614,831	\$141,726,432	\$199,130	\$999,867,944
Unita	\$5,043,060	\$82,512,345	\$19,310,135	\$58,272,097	\$165,137,637
Washakie	\$5,998,311	\$34,893,089	\$12,034,180	\$10,162,738	\$63,088,318
Weston	\$3,942,048	\$25,443,870	\$4,222,070	\$6,952,912	\$40,560,900
Totals	\$193,407,094	\$3,617,168,638	\$922,026,388	\$1,364,510,842	\$6,097,112,962

¹State of Wyoming Department of Revenue 2007 Annual Report, pages 60 and 66

Table 3-46. Total of All State Assessed Property by County

	Non-Minerals²	Minerals²	Total of All State Assessed²	% of Total²
Albany	\$32,325,051	\$4,800,959	\$37,126,010	0.24%
Big Horn	\$14,933,003	\$137,256,514	\$152,189,517	0.99%
Campbell	\$87,969,218	\$3,903,447,011	\$3,991,416,229	25.93%
Carbon	\$59,467,588	\$676,413,047	\$735,880,635	4.78%
Converse	\$65,728,740	\$308,161,966	\$373,890,706	2.43%
Crook	\$6,489,648	\$86,306,486	\$92,796,134	0.60%
Fremont	\$20,190,394	\$866,915,401	\$887,105,795	5.76%
Goshen	\$25,144,802	\$42,521	\$25,187,323	0.16%
Hot Springs	\$7,464,336	\$135,790,266	\$143,254,602	0.93%
Johnson	\$4,257,635	\$545,557,471	\$549,815,106	3.57%
Laramie	\$54,854,686	\$22,590,320	\$77,445,006	0.50%
Lincoln	\$47,045,475	\$584,992,496	\$632,037,971	4.11%
Natrona	\$37,794,608	\$406,617,408	\$444,412,016	2.89%
Niobrara	\$15,507,887	\$32,219,507	\$47,727,394	0.31%
Park	\$13,738,584	\$420,968,136	\$434,706,720	2.82%
Platte	\$69,597,514	\$1,526,011	\$71,123,525	0.46%
Sheridan	\$14,193,771	\$291,275,286	\$305,469,057	1.98%
Sublette	\$3,772,761	\$3,792,898,647	\$3,796,671,408	24.66%
Sweetwater	\$135,630,638	\$1,789,510,897	\$1,925,141,535	12.51%
Teton	\$9,972,304	\$2,371,760	\$12,344,064	0.08%
Unita	\$59,556,786	\$463,430,005	\$522,986,791	3.40%
Washakie	\$8,004,307	\$47,934,030	\$55,938,337	0.36%
Weston	\$14,134,282	\$65,354,313	\$79,488,595	0.52%
Totals	\$807,774,018	\$14,586,380,458	\$15,394,154,476	100.00%

²State of Wyoming Department of Revenue 2007 Annual Report, p. 68

Table 3-47. Assessed Valuation of Rangeland Compared to Local and State Valuations

	% of Total Range Lands Valuation of Locally Assessed Valuation-'07	% of Total Range Lands Valuation of State Assessed Valuation-'07	% of Total Range Lands Valuation of Total Assessed Valuation-'07
Albany	1.96%	13.95%	1.72%
Big Horn	2.19%	1.03%	0.70%
Campbell	1.13%	0.16%	0.14%
Carbon	2.59%	0.55%	0.45%
Converse	5.04%	1.78%	1.32%
Crook	14.73%	8.00%	5.18%
Fremont	0.89%	0.30%	0.23%
Goshen	7.40%	24.76%	5.70%
Hot Springs	3.62%	0.87%	0.70%
Johnson	5.36%	1.42%	1.13%
Laramie	0.83%	7.51%	0.75%
Lincoln	0.54%	0.25%	0.17%
Natrona	0.67%	0.89%	0.38%
Niobrara	25.93%	10.01%	7.22%
Park	0.90%	0.59%	0.36%
Platte	5.05%	4.15%	2.28%
Sheridan	1.48%	1.52%	0.75%
Sublette	1.10%	0.08%	0.08%
Sweetwater	0.71%	0.17%	0.14%
Teton	0.04%	3.53%	0.04%
Unita	1.26%	0.40%	0.30%
Washakie	2.32%	2.62%	1.23%
Weston	8.43%	4.30%	2.85%
State Average	1.47%	0.58%	0.42%

Table 3-48 provides a comparison of the state and locally assessed valuations for both 2006 and 2007. Fremont County's assessed valuation was one of five counties that actually fell in 2007. The other counties that also fell were Carbon, Lincoln, Sublette and Unita. And the two counties valuations that declined the most during this timeframe were Sublette at about \$315 million and Fremont at slightly over \$185 million.

Table 3-48. Comparison of State and Locally Assessed Valuations (2006 & 2007)

	State Assessed ³			Locally Assessed ³			Total Assessed ³		
	Total 2007	Total 2006	'07 vs. '06	Total 2007	Total 2006	'07 vs. '06	Total 2007	Total 2006	'07 vs. '06
Albany	37,126,010	28,234,029	8,891,981	263,852,636	242,513,230	21,339,406	300,978,646	270,747,259	30,231,387
Big Horn	152,189,517	142,117,917	10,071,600	71,868,718	64,497,038	7,371,680	224,058,235	206,614,955	17,443,280
Campbell	3,991,416,229	3,777,059,839	214,356,390	561,650,264	486,502,114	75,148,150	4,553,066,493	4,263,561,953	289,504,540
Carbon	735,880,635	776,729,398	-40,848,763	156,117,705	121,954,030	34,163,675	891,998,340	898,683,428	-6,685,088
Converse	373,890,706	340,434,000	33,456,706	131,882,811	116,952,031	14,930,780	505,773,517	457,386,031	48,387,486
Crook	92,796,134	82,443,103	10,353,031	50,417,125	54,734,807	-4,317,682	143,213,259	137,177,910	6,035,349
Fremont	887,105,795	1,110,548,788	-223,442,993	303,432,207	265,090,829	38,341,378	1,190,538,002	1,375,639,617	-185,101,615
Goshen	25,187,323	23,478,114	1,709,209	84,307,636	78,832,624	5,475,012	109,494,959	102,310,738	7,184,221
Hot Springs	143,254,602	122,050,066	21,204,536	34,382,874	30,305,160	4,077,714	177,637,476	152,355,226	25,282,250
Johnson	549,815,106	338,932,676	210,882,430	146,245,759	108,049,300	38,196,459	696,060,865	446,981,976	249,078,889
Laramie	77,445,006	71,640,839	5,804,167	697,048,532	652,493,806	44,554,726	774,493,538	724,134,645	50,358,893
Lincoln	632,037,971	697,282,980	-65,245,009	299,520,738	246,341,051	53,179,687	931,558,709	943,624,031	-12,065,322
Natrona	444,412,016	472,632,245	-28,220,229	589,027,272	471,473,689	117,553,583	1,033,439,288	944,105,934	89,333,354
Niobrara	47,727,394	39,361,036	8,366,358	18,413,765	17,568,568	845,197	66,141,159	56,929,604	9,211,555
Park	434,706,720	378,479,484	56,227,236	286,738,881	246,341,136	40,397,745	721,445,601	624,820,620	96,624,981
Platte	71,123,525	69,378,767	1,744,758	58,470,622	52,296,834	6,173,788	129,594,147	121,675,601	7,918,546
Sheridan	305,469,057	296,512,918	8,956,139	313,919,284	268,149,896	45,769,388	619,388,341	564,662,814	54,725,527
Sublette	3,796,671,408	4,170,695,916	-374,024,508	289,027,314	230,922,401	58,104,913	4,085,698,722	4,401,618,317	-315,919,595
Sweetwater	1,925,141,535	1,990,544,347	-65,402,812	472,134,020	390,096,548	82,037,472	2,397,275,555	2,380,640,895	16,634,660
Teton	12,344,064	12,698,467	-354,403	999,867,944	913,057,219	86,810,725	1,012,212,008	925,755,686	86,456,322
Unita	522,986,791	608,805,867	-85,819,076	165,137,637	140,627,994	24,509,643	688,124,428	749,433,861	-61,309,433
Washakie	55,938,337	59,943,254	-4,004,917	63,088,318	57,354,391	5,733,927	119,026,655	117,297,645	1,729,010
Weston	79,488,595	77,497,875	1,990,720	40,560,900	35,003,149	5,557,751	120,049,495	112,501,024	7,548,471
Totals	15,394,154,476	15,687,501,925	-293,347,449	6,097,112,962	5,291,157,845	805,955,117	21,491,267,438	20,978,659,770	512,607,668

³State of Wyoming Department of Revenue 2007 Annual Report, p. 69

The total ad valorem tax assessed that was applied to the 2006 mineral production is depicted in Table 3-49. It also shows the relative importance of these taxes by county and state. The two counties having the largest total ad valorem production taxes assessed are Campbell at 25.57% and Sublette with 24.62%. By comparison, Fremont County's share of the state total is 6.72%.

Table 3-49. County and Statewide Average 2007 Mill Levies Applied to 2006 Mineral Production⁴

County	Average Mineral 2007 Mill Levies	Total Ad Valorem Production Tax Assessed	% of State Total
Albany	65.000	\$312,062	0.03%
Big Horn	73.592	\$10,101,044	1.11%
Campbell	59.815	\$233,486,459	25.57%
Carbon	61.807	\$41,807,319	4.58%
Converse	60.260	\$18,569,742	2.03%
Crook	61.522	\$5,309,708	0.58%
Fremont	70.810	\$61,386,027	6.72%
Goshen	68.013	\$2,892	0.00%
Hot Springs	70.008	\$9,506,405	1.04%
Johnson	68.829	\$37,550,176	4.11%
Laramie	71.829	\$1,622,651	0.18%
Lincoln	61.876	\$36,197,272	3.96%
Natrona	66.028	\$26,848,122	2.94%
Niobrara	68.500	\$2,207,037	0.24%
Park	70.742	\$29,780,328	3.26%
Platte	67.539	\$103,065	0.01%
Sheridan	66.299	\$19,311,197	2.12%
Sublette	59.270	\$224,804,720	24.62%
Sweetwater	65.449	\$117,121,462	12.83%
Teton	59.292	\$140,626	0.02%
Unita	62.706	\$29,059,972	3.18%
Washakie	69.279	\$3,320,808	0.36%
Weston	68.283	\$4,462,589	0.49%
Totals	62.593	\$913,011,683	100.00%

⁴State of Wyoming Department of Revenue 2007 Annual Report

Summary

To put the above sections in perspective, it is helpful to compare some of the key variables in Fremont County with the State of Wyoming. In order to do that, population, earnings and employment will be compared. Those comparisons are shown in Table 3-50.

Table 3-50. Comparison of Population, Earnings and Employment in Fremont County

	% Change in Population -'70-'05	% Change in Wage & Salary Employment -'70-'05	% of Proprietors-1970	% of Proprietors-2005	Personal Income Annual Growth Rate-'70-'05	Non-Labor Income Annual Growth Rate-'70-'05	Labor Income Annual Growth Rate-'70-'05	Non-Labor Sources % of Total Personal Income-'05
Fremont	29%	63%	18%	27%	2%	5%	2%	44%
Wyoming	52%	74%	19%	23%	3%	4%	3%	36%

One of the trends that emerge in Table 3-50 is the population growth for Wyoming is significantly higher than it is in Fremont County. Regarding the change in wage and salary employment, the Wyoming growth from 1970-2005 is again larger than Fremont County. However the percent of proprietors in both 1970 and 2005 compared to the total employment is about the same for both Wyoming and Fremont County. Also, the personal income, non-labor income and labor income growth rate is about the same for both Wyoming and Fremont County. But interestingly enough, the unemployment rates downloaded from the Bureau of Labor Statistics (BLS) web site (<http://www.bls.gov/>) indicates that the unemployment rate has been consistently higher in Fremont County as compared to Wyoming from 1990 to 2006 (Table 3-51). That statistic indicates even though the growth rate in income from 1970 to 2005 is about the same for Wyoming and Fremont County, there are relatively more people unemployed in Fremont than Wyoming.

Table 3-51. Unemployment Rate in Fremont County (1990-2006)

Year	Fremont Labor Force	Fremont Employment	Fremont Unemployment	Fremont Unemployment Rate	Wyoming Labor Force	Wyoming Employment	Wyoming Unemployment	Wyoming Unemployment Rate
1990	15,734	14,553	1,181	7.51%	236,043	223,531	12,512	5.30%
1991	15,603	14,539	1,064	6.82%	235,124	223,192	11,932	5.07%
1992	16,049	14,817	1,232	7.68%	238,076	224,562	13,514	5.68%
1993	16,299	15,105	1,194	7.33%	242,599	229,177	13,422	5.53%
1994	16,999	15,738	1,261	7.42%	249,475	236,885	12,590	5.05%
1995	17,406	16,106	1,300	7.47%	253,196	240,846	12,350	4.88%
1996	17,715	16,304	1,411	7.97%	254,717	241,560	13,157	5.17%
1997	17,579	16,188	1,391	7.91%	256,263	243,944	12,319	4.81%
1998	17,767	16,328	1,439	8.10%	260,570	247,748	12,822	4.92%
1999	18,176	16,787	1,389	7.64%	264,676	251,828	12,848	4.85%
2000	17,665	16,749	916	5.19%	266,882	256,685	10,197	3.82%
2001	18,149	17,214	935	5.15%	269,985	259,508	10,477	3.88%
2002	18,160	17,184	976	5.37%	269,654	258,462	11,192	4.15%
2003	17,797	16,765	1,032	5.80%	272,114	259,987	12,127	4.46%
2004	17,682	16,765	917	5.19%	274,458	263,705	10,753	3.92%
2005	17,801	16,941	860	4.83%	277,899	267,669	10,230	3.68%
2006	17,738	16,968	770	4.34%	284,690	275,617	9,073	3.19%

Looking at the distribution of earnings by sector indicates that, for example, farm earning in Fremont County has dropped from seventh (5.58% of total earnings) in 1970 to tenth (1.44% of total earnings) in 2000 out of the eleven sectors examined in the analysis. By 2005, Farm Earnings ranked fifteenth (1.66% of total earnings) out of the eighteen sectors identified.

The top three sectors measured in terms of percentage of total earnings from 1970 to 2005 was Mining (22.71%), government and government enterprises (20.11%) and Construction (13.31%) in 1970. This had changed somewhat by 2000 where Government and government enterprises (29.18%) was number one, followed by Services (21.99%) and Retail Trade (11.25%). By 2005, the top three were Government and government enterprises (32.67%), Other (utilities, wholesale trade, educational services, health care and social assistance) (14.72%) and retail trade (8.32%). What is interesting is government and government enterprises was in the top three for 1970, 2000 and 2005 and retail trade moved into a top three position in both 2000 and 2005. Finally, for more information on the study area, please refer to the Fremont County and Riverton, Lander and Jeffrey City profiles available at the Lander Field Office.