3.1 RESOURCES

3.1.1 AIR QUALITY

Laws, Regulations, and Policies

Air quality management on public lands administered by the BLM is directed by the following laws, mandates, and guidance:

- Clean Air Act 42 USC 1857 (1970, 1977)
- Clean Air Act of 1990, as amended, 42 USC, 7418
- Executive Order 12088, Federal Compliance with Applicable Pollution Control Standards, Coordination with the Environmental Protection Agency, State, interstate, and local agencies
- 40 CFR 52.1370 (Air Programs Montana)
- 40 CFR 81.327 (Attainment Status Designations)
- 40 CFR 52.29 (Visibility Requirements)
- EPA 1998 Interim Air Quality Policy for Wildland and Prescribed Fires
- Federal Wildland Fire Management Policy, December 1995, January 2001
- Montana/Dakotas Fire Management Plan
- Montana/Idaho Airshed Group Smoke Management Program
- Wilderness Management Policy, September 1981
- Wildland fire suppression actions are emergency response actions under CERCLA.

Affected Environment

Air quality in Beaverhead and Madison Counties is excellent. Southwest Montana, which encompasses Beaverhead and Madison County, is in attainment meaning that the air resource meets or exceeds all National Ambient Air Quality Standards. The closest Montana Ambient Air Quality monitoring sites are located north of the Dillon Field Office Area in Butte. Butte is the closest Montana State PM 10 Non-attainment Area.

The 1977 Amendments to the Clean Air Act resulted in the development of three Air Quality Classes under the provisions of Section 160, Prevention of Significant Deterioration. Class I Areas are areas where visibility is an important value. There are strict standards for such areas. Class I Areas are generally national parks or wilderness areas. Red Rocks Lakes National Wildlife Refuge is a Class I Area and is located in the Centennial Valley, south of the DFO. Several other Class I areas are located in areas surrounding Beaverhead and Madison Counties. These include: Yellowstone National Park to the

east, Anaconda Pintlar Wilderness to the northwest and Selway-Bitterroot Wilderness beyond Anaconda Pintlar. The Lee Metcalf Wilderness which includes the Bear Trap Unit administered by BLM is classified as Class II. Areas not specifically designated Class I or Class III are by default Class II Areas, therefore all public lands in the planning area are in Class II.

Air Quality Issues

Air quality issues in the planning area center mainly around smoke. Smoke contributors in the planning area include wildfire, prescribed fires, private debris burning, agricultural burning, slash burning, and wood burning stoves. In southwest Montana, spring and summer seasons usually produce the best smoke dispersal. Spring and summer daytime heating and general wind flows help raise the smoke columns high into the atmosphere and disperse them rapidly. By mid-September, the air quality naturally begins to deteriorate as nighttime inversions often develop.

Wildfire can produce short-term adverse effects on air quality. Air quality and visibility can deteriorate due to temporary air stagnation during wildfire events, which are most common during the months of July, August, and September.

The effects of smoke from prescribed burning is affected by the season of burning, the overall stability of the atmosphere, wind flows, topography, and the time of day during which burning occurs. Management prescribed fires contribute smoke to the airshed, though these fires tend to produce less smoke than wildfires of equal size since fuel consumption is typically lower in prescribed burns. The effects of prescribed burning on air quality are usually most severe from mid-September through November when smoke dispersal may be poor for much of the time. Air quality is poorest from December through February due to atmospheric conditions trapping pollutants.

Smoke Management and Monitoring

The 1998 Interim Air Quality Policy for Wildland and Prescribed Fires requires states to develop smoke management plans. The Montana/Idaho Airshed Group developed the Montana/Idaho Smoke Management Program. There are three airshed units across Idaho and Montana broken into 25 airsheds. Airsheds are geographical areas with similar atmospheric characteristics and the planning area is located in Airshed 7, which encompasses both Beaverhead and Madison Counties. Prescribed burning in the planning area is done in accordance with the Montana/Dakotas Fire Management Plan and is coordinated with MT DEQ and the Montana/Idaho Airshed Group. Prescribed burning is accomplished when dilution, dispersal, and mixing conditions are generally good.

During prescribed fire season, the Smoke Monitoring Unit supports the Montana/Idaho Airshed Group to prevent or reduce the impact of smoke on area communities–especially when that smoke could contribute to a violation of national air quality standards. During the summer wildfire season, the Smoke Monitoring Unit assists state and local governments in monitoring smoke levels and providing information about smoke to the public, firefighters, and land managers.

3.1.2 CULTURAL RESOURCES

Laws, Regulations, and Policies

Important legislation and other mandates and direction governing cultural resource management on public lands include the following:

- Antiquities Act of 1906 (P.L. 59-209; 34 Stat. 225; 16 U.S.C. 432, 433)
- Historic Sites Act of 1935 (P.L. 74-292; 49 Stat. 666; 16 U.S.C. 461)

- Reservoir Salvage Act of 1960, as amended by Archeological and Historic Preservation Act of 1974 (P.L. 86-523; 74 Stat. 220, 221; 16 U.S.C. 469; P.L. 93-291; 88 Stat. 174; 16 U.S.C. 469)
- National Historic Preservation Act of 1966 as amended (P.L. 89-665; 80 Stat. 915; 16 U.S.C. 470
- National Environmental Policy Act of 1969 (P.L. 91-190; 83 Stat. 852; 42 U.S.C. 4321
- Federal Land Policy and Management Act of 1976 (P.L. 94-579; 90 Stat. 2743; 43 U.S.C. 1701; "FLPMA")
- American Indian Religious Freedom Act of 1978 (P.L. 95-431; 92 Stat. 469; 42 U.S.C. 1996)
- Archaeological Resources Protection Act of 1979 (P.L. 96-95; 93 Stat. 721; 16 U.S.C. 47Oaa et seq.) as amended (P.L. 100-555; P.L. 100-588)
- Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601; 104 Stat. 3048; 25 U.S.C. 3001)
- Executive Order 11593, Protection and Enhancement of the Cultural Environment)
- Executive Order 1300, Providing for American Indian and Alaska Native Religious Freedom and Sacred Land Protections
- Executive Order 13084, Consultation and Coordination with Indian Tribal Governments
- Executive Order 13195, Trails for America in the 21st Century
- 36 CFR Part 800 (Protection of Historic Properties)
- 36 CFR Part 60 (National Register of Historic Places)
- 36 CFR Part 7 (Waiver of Federal Agency Responsibilities under Section 110 of the National Historic Preservation Act)
- 43 CFR Part 7 (Protection of Archaeological Resources)
- BLM policy and program guidance for the management of cultural resources outlined in Manual Sections 8100, 8110, 8120, and 8130
- National Programmatic Agreement with the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers

Affected Environment

The BLM is responsible for identifying, protecting, managing, and enhancing cultural resources which are located on public lands, or that may be affected by BLM undertakings on non-Federal lands. Cultural resources include archaeological, historic, and architectural properties, as well as traditional lifeway values important to Native American groups (see **Glossary** definitions for cultural resource, archaeological remains, cultural property, historic property, and traditional lifeway values).

Description and Summary

As of December 2001, BLM lands within the planning area contain approximately 1,061 previously recorded cultural properties representing a wide variety of site types and chronological periods. The known cultural resources include 752 (70.9%) prehistoric sites, 256 (24.1%) historic sites, and 53 (5.0%) multi-component historic/prehistoric sites. Together, these resources document an almost continuous record of human occupation in the planning area for the past 14,000 years.

In general, cultural resources are identified through field inventories conducted by qualified professionals to comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA). Informant information and historical records are also used to identify archaeological, historical, and traditional lifeway values. Three types of inventories – Class I, Class II, and Class III (see *Glossary* definition cultural resource inventory classes) are conducted to identify and assess these values on BLM public lands. An estimated 104,840 acres (11.5%) of the planning area have been inventoried for cultural resources at the Class II level using a variety of methods.

Just over 65,000 acres (7%) of the planning area have been intensively inventoried at the Class III level. A majority of the Class III inventories were associated with federal undertakings where cultural properties needed to be identified and evaluated in order to protect significant values and minimize effects on these values.

The most common type of prehistoric site in southwestern Montana is the lithic scatter, a site which contains stone tools, and/or flakes of stone left during the process of making or repairing a stone tool, such as a knife, arrow point, spear point, or hide scraper. Lithic scatters may represent the remnants of prehistoric tool manufacturing/maintenance locales, hunting camps, animal butchering sites, or stone quarries. The ubiquitous lithic scatter comprises approximately 70% of recorded prehistoric sites in the planning area. Other prehistoric site types in western Montana include bison jumps, game traps, tipi ring encampments, vision quest sites, wickiups, and rock art sites, among others. Two Class I level overviews of prehistoric resources in southwest Montana encompass the planning area and provide a synthesis of available information (Deaver and Deaver 1990; Foor 1996). Comparison of current prehistoric site type frequency and composition, with that provided in early Class I overviews, indicate more recorded sites by essentially the same site type variability, frequency of occurrence, and composition.

The most common type of historic cultural resource relates to the mining of gold, silver, lead, and copper during the latter part of the 19th century and the early part of the 20th century. Such properties include mining camp remnants, ghost towns, miners' cabins, mining shafts, adits, mills, smelters, and an assortment of other mining related buildings, structures, and landscape features. Several comprehensive overviews of historic metal mining in Montana have been produced in recent years, and provide the important context with which to evaluate such properties (Godfrey 2002; Warhank 1999; Herbort 1995a and 1995b). Other historic period sites include transportation networks, lumber mills, homesteads, forgotten cemeteries, irrigation ditches, cow/sheep camps, and trash dumps. Historical overviews and summaries of these types of resources in the planning area may be found in Brown (1975) and Ingram (1976).

Of the 1061 known sites within the planning area, formal determinations of significance or eligibility have been made on only 200 properties (18.9%). Of these evaluated properties, 96 have been determined to be eligible for the National Register and 104 have been determined NOT eligible for the National Register. Sites that have been formally listed on the National Register of Historic Places include the Big Sheep Creek Wickiup (24BE601), Union City and the Christenot Mill (24MA1215). Public lands are also included within the boundaries of several additional listed properties/districts, including: Beaverhead Rock (24MA259), Pony Historic District (24MA907), and the Strawberry Mine Historic District (24MA810). Many of the remaining unevaluated sites are likely to be considered eligible to be listed on the National Register of Historic Places (NRHP). There are two designated National Historic Landmarks that incorporate, or are adjacent to, public lands: Bannack National Historic Landmark and Virginia City National Historic Landmark. National Historic Trails traversing the planning area include: the Lewis and Clark National Historic Trail and the Nez Perce (Nee-me-poo) National Historic Trail.

The Dillon Field Office lies at the boundaries of three distinct physiographic and cultural areas: the Great Basin, the Plains, and the Columbia Plateau (**see Map 2)**. Native Americans groups associated with all three culture areas have lived on, or traversed through, the lands within the Dillon Field Office for thousands of years. They hunted, fished, gathered plant foods, buried their dead, and conducted religious ceremonies. Beliefs customs, and practices of their culture were passed down through generations and were still in use when Indians were removed from their homelands onto reservations.

The Shoshone-Bannock Tribes of the Ft. Hall Reservation and the Confederated Salish and

Kootenai Tribes of the Flathead Reservation maintain active interests in the planning area. Individual tribal members occasionally use public lands to gather plants or other native materials, cut tipi poles, and hunt or fish. However, these groups have been removed from the area for so long, they are gradually losing the historical and cultural ties to locations that are distant from their current reservations. Continuing consultation efforts with these groups have yet to identify specific traditional cultural properties or areas of religious significance within the planning area. They have, however, expressed concerns over the preservation and protection of specific archaeological sites (burial locations and pictograph sites) and impacts to prehistoric sites from archaeological excavations.

Prehistoric and Protohistoric Periods Overview

A generalized prehistory of western Montana can be categorized into four different time periods, which are distinguished on the basis of differences in material culture traits or artifacts, and subsistence patterns:

Paleoindian/Early Prehistoric Period (12,000 B.C. to 5,500 B.C)

The Paleoindian period is commonly believed to represent the first known cultural tradition in the New World. The people living in this period are thought to have arrived during the end of the last ice age, circa 12,000 to 14,000 years ago, when a land mass extended into the Bering Sea, connecting the Asian continent with Alaska.

The Paleoindian period was characterized by a climate that was cooler and wetter than modern conditions, and by the presence of large Pleistocene or ice-age mammals that would soon become extinct. The Paleoindian lifeway was oriented around the hunting of big game animals (such as the wooly mammoth and ancient bison), which were dispatched by small hunting groups using lances and spears. The most distinctive Paleoindian cultural material traits are large leaf-shaped lance and spear points. The earliest part of the period is recognized by the distinctive Clovis and Folsom points, which have a central flute or channel flake scar that runs up from a concave base. There are 15-recorded Paleoindian period sites/locations on public lands in the Planning Area.

Archaic/Middle Prehistoric Period (5,500 B.C. to A.D. 500)

The early portion of the Archaic Period is characterized by a warm/hot and dry climate, which became desert-like during this period. The surviving remnants of large Pleistocene animals became extinct during this time. Due to the more diverse resources of the mountain foothill areas, and because the remaining populations of large ice age mammals had become extinct, the Archaic immigrants hunted a wider array of animals than their Paleoindian ancestors. Adapting to smaller, modern forms of game animals, Archaic groups replaced the large leaf-shaped lance and spear points with smaller corner and side-notched projectile points, which were used with the "atlatl" or spearthrower. Archaic peoples also relied more upon plant foods as indicated by increased numbers of tools and features associated with the processing of plant foods (e.g., basin-shaped milling stones). Cultural hallmarks of the period include the development of sophisticated communal bison hunting techniques and the use of a wide variety of different projectile point forms. Associated with this economic pursuit was a highly nomadic existence where groups conducted seasonal rounds within a relatively large area. There area 58-recorded Archaic/Middle Period sites located on public lands in the Planning Area.

Late Prehistoric Period (A.D. 500 to ca. 1600)

Cultural groups during this period continued to pursue an increasingly mobile way of life in order to exploit a large variety of seasonally available game and plant resources. Game was pursued with the bow and arrow, and the dog was an important lightweight beast of burden and hunting assistant. Late Prehistoric sites are recognized by arrow points, tipi rings, intrusive

pottery left by groups coming in from the south and east, and by the remains of wickiups left by Shoshonean groups coming in from the Great Basin. There are 51-recorded Late Period sites on public lands in the Planning Area.

Protohistoric Period (A.D. 1600 to 1805+)

Protohistoric refers to the time period immediately before written history. The period began in Montana when Plains and Great Basin Indian groups began using the horse, followed by the use of Euro-American goods, notably firearms, trade beads, and metal implements, which were fashioned into knives, and other practical tools. These items were traded into the region from other tribal groups long before white men came into the area. The horse, in particular, created a profound change or "cultural revolution" on the Plains. The horse made people on the Plains extremely mobile and highly efficient hunters, especially in regard to bison hunting. Among other effects, this increased mobility led to intensified territorial disputes with neighboring tribes, resulting in shifting tribal boundaries. Federally recognized Indian tribes whose ancestors inhabited western Montana at various times include the Confederated Salish-Kootenai Tribes, the Shoshone-Bannock Tribes, and the Blackfeet Tribe. The Protohistoric Period ended with the arrival of the Lewis and Clark Expedition in 1805, which is generally understood to represent the first written records of the area and beginning of the historic period in southwestern Montana. There are six recorded Protohistoric sites on BLM lands in the planning area.

Historic Period Overview

Following in the wake of the Lewis and Clark Expedition, fur traders began to actively trap for beaver and other mammals in tributary streams and rivers of both the Missouri and Columbia River systems. This enterprise ended by the close of the 1830s due to the depletion of beaver and other fur bearing mammals, and because of a decline in demand for pelts as a result of changes in fashion and the rise of the European and American textile industries. As noted below, there are several interpretive opportunities for locations associated with this early historic period.

Gold prospectors and a few early settlers began moving into southwestern Montana following the demise of the fur trapping industry. The first wave of mining began in the early 1860s and lasted for about the next 20 years focusing on the mining of placer gold gravel deposits along larger streams and drainages. This was followed by lode, or hard rock, mining of bedrock of gold, silver, and then copper deposits. There are approximately 20 known historic mining districts that incorporate public lands within the planning area.

By World War I the mining of hard rock gold was essentially over, although some small ventures continued. A revival occurred during the Great Depression era of the 1930s when the price of gold almost doubled. Overnight, the gold mining streams and fields were once again sluiced and mined with pick and shovel. Unlike before though, this was done by out-of-work miners and others who were trying to eke out some sort of livelihood during the harsh economic times of the Great Depression. The Great Depression mining era closed at the outbreak of World War II. Gold mining continues today, generally by large corporations who mine for so-called "flour" gold. The mining of this type of gold requires tons of earth to be removed and the use of highly sophisticated processing techniques in order to retrieve a few ounces of the precious yellow metal.

Though the region continued to support mining endeavors, the economic emphasis shifted to agricultural pursuits along the major river valleys (Madison, Ruby, Jefferson, and Beaverhead). Many of the earliest farming and ranching operations started to supply the needs of early mining camps. As mining and agricultural industries continued to develop, transportation routes were formalized insuring a steady flow of goods and materials into and out of the area. These routes connected southwestern Montana to the railroad hubs at Corrine, Utah and the riverboat port of Ft.

Benton. In the 1880's railroads entered the area forging a permanent link with regional, national, and international commerce.

Cultural Resources Condition and Trend

The condition and trend of cultural resources in the planning area varies considerably due to the diversity of terrain, geomorphology, access and visibility, and past and current land use patterns. Because recorded sites are manifest by exposed artifacts, features, and/or structures, they are easily disturbed by elements such as wind and water erosion, animal and human intrusion, natural deterioration and decay, and development and maintenance activities. Based on limited site monitoring, site form documentation, and informant information, the trend of site conditions in the planning area is considered to be downward. Active vandalism or collecting (unauthorized digging and "pothunting") has been observed in limited instances, but currently is not endemic. Impacts caused by development and maintenance activities (e.g. erosion, grazing, mining, recreation) are known to be affecting certain site locations. Perhaps the most pressing concern is the natural deterioration and decay of standing structures at historic mining and homesteading sites, and prehistoric wickiups. Collectively, these agents have adversely affected and continue to adversely affect many known cultural resources.

Within the planning area, the "demand" for cultural resources is thought to be moderate. This determination is based on the known research interests of area scholars and other professionals, interest expressed by members of the Native American and local communities, documented site conditions, informant information, and site visitation. Many interpretive opportunities are also present to provide both educational as well as recreational benefits.

Use Categories

Updated BLM planning and Manual guidance stress the importance of meeting specified goals through the allocation of all cultural properties in the planning area (**whether already recorded or projected to occur**) into defined "use categories", based on their nature and relative preservation value.

The identified use categories include:

a. Scientific Use: sites preserved until research potential is realized
b. Conservation for Future Use: sites preserved until conditions for use are met
c. Traditional Use: long-term preservation of sites
d. Public Use: long-term preservation, on site interpretation
e. Experimental Use: sites protected until used
f. Discharged from Management: sites are removed from protective measures

A detailed description of individual use categories is presented in **Appendix C**.

In order to allocate the numerous known sites and sites "projected to occur" (those yet to be found or recorded) into the identified use categories, criteria must be established which employ a combination of easily recognizable site type and site attribute information that can, for example, differentiate between small, short duration, limited activity sites and large, complex multiple-activity sites. For prehistoric resources the criteria are weighted to emphasize the "information potential", since the determination significance for such sites are generally related to their scientific value. For historic resources, the criteria are more reflective of site "condition and integrity" characteristics, which play a greater role in the evaluation of historic properties.

It is also important to recognize that it is possible for sites to be placed into more than one use category. As an example, a prehistoric site with little or no scientific value could be placed in a Discharge from Management category, but also be useful in the Experimental Use category. Similarly, an historic site could be placed in the Public Use category, but require stabilization

and preservation efforts and therefore warrant placement into the Conserve for Future Use category as well.

Prehistoric Resources: Since over 70% of prehistoric sites in the planning area are defined as lithic scatters, it is important to be able to identify potential discriminating elements that can be used to segregate such a large category of prehistoric resources into different use categories. A qualitative assessment of certain aspects of material culture (relative diversity and quantity of artifactual materials) and complexity (spatial patterning of artifacts, presence/absence of features, presence/absence of buried deposits, etc.), coupled with a quantitative measure of site size (in acres) can be utilized to meet the purposes identified. These values will serve as indirect indicators of relative site function, relative duration of occupation, research value and importance.

The important aspects of material culture include: Artifact diversity - variety of cultural materials present such as raw material types, variety of materials present bone, stone, ethno botanical qualitatively measured from low to high. Artifact quantity - relative quantity of material culture present (less than 50 items, hundreds, thousands, etc.) a qualitative measure intended to capture "magnitudes of difference". Site complexity – as indicated by any spatial patterning in distribution of cultural material, the presence or absence of associated features, the presence of buried deposits and stratigraphy. Site complexity is qualitatively measured from low to high. Site size - a quantitative measure, looking for modal patterns in overall site size that may reflect a number of things, site function, duration of occupation, etc. These variables will serve as a model to distinguish between the small, more redundant and transient, or temporary, limited use lithic scatters, and larger, longer occupied, camps/habitation sites, and/or extractive use locations.

Based on the model presented above, it is expected that use categories to be reflected as follows:

Scientific Use: prehistoric sites that exhibit high diversity and large quantity (>50 artifacts) of material culture, high complexity (spatial patterning of artifacts/activities, presence of features, stratified or buried deposits), and relatively larger size properties would be placed into the Scientific Use category.

Conservation Use: Sites that are representative of rare, or exceptional examples (functionally or temporally), would be considered for Conservation Use. In the planning area these would include sites such as wickiups (n=7), large quarry sites (Everson Creek/Black Canyon Quarry Complex), or sites with complex stratigraphic sequences (Mammoth Meadow).

Traditional Use: In consultation with Native American groups, certain types of prehistoric sites retain particular importance and significance (Deaver 1986). These sites types most commonly include: burial locations (n=6), pictograph/petroglyph sites (n=5), and vision quest locations (n=12). Medicine wheels, dance grounds and intaglios (e.g., Napi Figures) also are in this category, but none are known to occur on public lands in the planning area. In addition, certain tipi ring sites, may also fit this use category but need to be evaluated on a case-by-case basis. Collectively these sites amount to less than 10% of recorded cultural resources in the planning area.

Public Use: Prehistoric sites could be considered for Public Use (interpretation) in those few instances, where interpretive potential is high and site integrity could be insured through protective measures. Such uses should not be attempted without full consultation with interested Native American groups. Consequently, such prehistoric sites still require evaluation on a case-by-case basis. Current opportunities include the Burma Road Buffalo Jump and Red Mountain Tipi Ring site.

Experimental Use or Discharge from Use: sites with low diversity and limited quantity (<50) of artifacts; low or limited complexity; and small size (redundant small surface lithic scatter, information potential is exhausted with initial site recordation). Sites will be individually evaluated prior to placement into Experimental Use or Discharge from Use categories.

Historic Resources: Unlike prehistoric resources, historic properties are more commonly determined to be significant for reasons other than their "scientific value". Similarly, condition and integrity also tends to play a more obvious role in the evaluation of historic properties, which contain architectural or structural remains. Historic resources in the planning area also vary greatly in size, function, and complexity; ranging from small trash dumps, isolated prospect pits and claim markers to complex industrial properties such as mines, mills, and smelters; and from isolated trails, line shacks or miners cabins to abandoned wagon roads, railways, and ghost towns.

Scientific Use: Historic sites with archaeological and historical values and generally poor, structural integrity (collapsed or deteriorated), would be placed in this category.

Conservation Use: Historical sites that are rare or exceptional examples that retain integrity would be considered for Conservation Use. In the planning area these would include well-preserved remnants of historic mines, mills (Alder Gulch Mills), ghost towns (Glendale and Rochester), and homesteads (Ney Ranch). It should be noted that the defined use categories are not necessarily mutually exclusive, and that many sites can be placed in both the Conservation Use category (need to stabilize and preserve the architectural features) and the Public Use Category and possibly Scientific Use for example.

Traditional Use: Historic sites in this category would potentially include any sacred areas, traditional cultural properties, or plant gathering areas that have been historically utilized by Native American groups that have historically occupied the area. These sites would be determined in consultation with tribal representatives of the following tribes that have demonstrated historical use in the planning area including: the Shoshone-Bannock Tribes of the Fort Hall Reservation, the Confederated Salish and Kootenai Tribes of the Flathead Reservation, the Blackfeet Tribe of the Blackfeet Reservation, and the Crow Tribe of the Crow Reservation. To date, Native American traditional use areas have been yet to be identified.

Public Use: Historic sites that would be considered for Public Use include those where the interpretive potential is high and site integrity could be insured through protective measures. In addition, consideration is given for those standing structures that could be preserved and maintained for adaptive re-use for administrative or recreational uses. Historical themes that would lend themselves to interpretation include:

Early Exploration

Lewis and Clark Corps of Discovery

- Clark Campsite at mouth of Gallagher Creek
- Beaverhead Rock with MFWP
- Willards Pass (Bannack Bench)
- Lewis' Lookout (Notch Bottom)
- Lemhi Pass (Highway 324 Rest Stop)

Fur Trade Era

- Ruby Creek Battle - West Madison Campground
- Vanderberg killed by Blackfeet - Ruby Reservoir
- Father DeSmet in Centennial Valley left inscription

Historic Transportation Routes

- Bozeman Trail/Scanlon Toll Bridge at Red Mountain Campground
- Bannack-Corrine Wagon Road along Backcountry Byway

Virginia City-Corrine Wagon Road (Sweet Water,
Blacktail Deer Creek, Sage Creek)
Road Agent Trail/Road Agent Rock Bannack-Virginia City

Historic Mining/Ghost towns

Glendale Smelter and town site
Rochester Cemetery/town site
Alder Gulch (various mill sites, including Christenot
Mill/Union City)

Historic Homesteading/Ranching

Ney Ranch in the Beaverhead Acquisition Parcel

There are also numerous standing cabin structures and homesteads on public lands across the planning area that may potentially be sufficiently preserved, to be considered for a program of adaptive reuse and utilized as BLM administrative structures and/or in a recreational cabin rental program.

Experimental Use or Discharge from Use: Like prehistoric sites, individual sites would be evaluated on a case-by-case basis before assignment to either the Experimental Use or Discharge from Use categories. In general, properties assigned to these categories would have been determined to contain little or no scientific or historical value. Sites in these categories would generally include isolated trash dumps and artifact scatters, isolated features such as prospect pits or claim markers, and collapsed structural remains that no longer retain integrity of design or workmanship. Only those sites that have been formally determined to be Not Eligible for the National Register of Historic Places would be placed into either of these categories.

Cultural properties are evaluated with reference to National Register criteria for the purposes of assessing their historical values and their public significance. Such evaluations are carefully considered when cultural properties are allocated to use categories. Although preservation and nomination priorities must be weighted on a case-by-case basis, **Table 4** serves as a general guide illustrating the relationship between National Register evaluation and allocation to use categories

3.1.3FISHERIES

Laws, Regulations and Policy

Fisheries management on public lands administered by the BLM is directed by a variety of laws, executive orders, and policies, including memorandums of understanding between state and federal agencies as applied to specific situations. These include but are not limited to:

- Endangered Species Act
- Montana Natural Streambed and Land Preservation Act
- Federal Land Policy and Management Act of 1976
- National Environmental Policy Act of 1969
- Fish and Wildlife Coordination Act of 1958
- Water Quality Act of 1987, as amended from the Federal Water Pollution control Act of 1977
- Public Rangelands Improvements Act of 1978
- Sikes Act of 1974
- Wild and Scenic Rivers Act of 1968
- Executive Order 11514, Protection and Enhancement of Environmental Quality
- Executive Order 11988, Floodplain Management"
- Executive Order 11990, Protection of Wetlands
- Executive Order 12962, Recreational Fisheries
- Montana Water Quality Act
- Streamside Management Zone Law
- Montana Stream Protection Act
- Fish And Wildlife Conservation Act of 1980
- BLM Manual 1737 Riparian

Table 4. Relationship Among Cultural Resource Use Categories, National Register Eligibility, and Preservation/National Register Nomination

Cultural Resource Use Category	National Register Eligibility	Preservation/National Register Nomination	Site Types Generally Included
Scientific Use	Usually Eligible (under Criterion d)	Long-term preservation not critical; medium National Register nomination priority.	**Prehistoric**: sites with high artifact count and diversity, high complexity, and larger size; **Historic**: sites with archaeological and historic values, and generally poor structural integrity.
Conservation for Future Use	Always Eligible (generally eligible under Criterion d, a, or c and possibly b for historic sites)	Long-term preservation is required; highest nomination priority.	**Prehistoric**: sites inherently complex, or rare, or fragile and exhibit exceptional scientific values (e.g. wickiups, deeply stratified deposits, or large quarries) ; **Historic**: sites inherently complex, or rare, or fragile, generally significant standing structures (stabilization and preservation required).
Traditional Use	May Be Eligible (generally under Criterion a and d, possibly b and c as well)	Long-term preservation is desirable; nomination priority is determined in consultation with the appropriate cultural group(s).	Sites and locations determined in consultation with Tribal Groups. **Prehistoric** may include: burial locations, vision quest locations, pictographs and petroglyphs, certain tipi ring sites; **Historic/Modern**: plant gathering locations, areas considered sacred for religious purposes, etc..
Public Use	Usually Eligible (generally criterion a, b, and c, possibly d as well)	Long-term preservation is desirable; high nomination priority.	**Prehistoric**: High interpretive potential and can insure protection; **Historic**: High interpretive potential and can insure stabilization and protection, and/or adaptive reuse.
Experimental Use	May Be Eligible (generally under criterion d if at all)	Long-term preservation is not anticipated; low nomination priority.	**Prehistoric**: lithic scatters of limited artifact density and complexity; **Historic**: trash scatters, collapsed structures with no integrity or context
Discharge from Management	Not Eligible	Long-term preservation and management are not considerations; nomination is inappropriate.	**Prehistoric**: isolated finds, surface lithic scatters <50 items; **Historic**: isolated prospect pits; trash scatters <50 items, sites <50 years old,

- Fish and Wildlife 2000 (BLM National, State and District policies)
- Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana (1999)
- Memorandum of Understanding Concerning Fluvial Arctic Grayling Restoration (2001)
- Bureau of Land Management and Montana Department of Fish, Wildlife and Parks Cooperative Fish Management Plan (1984)
- Forestry Best Management Practices

Affected Environment

Fisheries Population Distribution, Size, Trend, and Management

The planning area contains four resident native coldwater game fish--westslope cutthroat trout (*Oncorhynchus clarki lewii),* mountain whitefish (*Prosopium williamsoni),* arctic grayling (*Thymallus arcticus*), and burbot (*Lota lota*), and four introduced resident coldwater game fish, rainbow trout (*Oncorhynchus mykiss),* brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), and yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri).* Additionally, ten non-game species spend all or part of their life cycle in waters in the planning area. They include the white sucker (*Catostomus commersoni*), longnose sucker (*Catostomus catostomus*), mountain sucker (*Catostomus platyrhynchus*), mottled sculpin (*Cottus bairdi*), stonecat (*Noturus flavus*), longnose dace (*Rhinichthys cataractae*), redside shiner (*Richardsonius balteatus*) common carp (*Cyprinus carpio*), flathead chub (*Platygobio gracilis*) and the utah chub (*Gila atraria*).

Resident cold-water species in the planning area are widely distributed and range from low to high abundance**.**

Current management emphasis in the planning area is improving the status of WCT by improving existing WCT habitat and conducting fishery inventories. BLM provides funding under a cost share agreement with Montana FWP for WCT inventories and genetic testing and also provides funding to Montana FWP for fluvial artic grayling recovery efforts. This has assisted in grayling re-introduction efforts in historic grayling habitat such as the Beaverhead, Ruby and Big Hole rivers. Fishery management on BLM lands in Montana is shared between Montana FWP, which manages fishery populations, and BLM, which manages fisheries habitat.

Fisheries Habitat Location and Condition

The DFO administers approximately 914 miles of perennial and intermittent streams. There are approximately 250 miles of fish bearing water within the administration area. The condition of fisheries habitat is in direct relation to water quality, riparian and range condition, and current and past land use practices. Habitat condition varies by stream, with the better quality fishery habitat found in areas that have use restrictions, are remote, or have better armoring. Most fisheries habitat is being affected from current and past management. Some areas are improving under new management practices, while others are currently in a downward trend. Based on the most current riparian assessments available, 59% of riparian areas in the planning area rate out at functional at risk, 23% rate out at Non-functional and 18% rate out at proper functional condition. Inventories to date show that BLM streams in the planning area have problems with excess sedimentation. Substrate embeddedness in surveyed streams ranges from about 20% to 75%. Substrate embeddedness refers to the infiltration of fine sediments into spawning gravels, diminishing the flow of water and dissolved oxygen through the gravels. Salmonid spawning success begins to decrease when substrate embeddedness exceeds 20%. Many areas have been adversely impacted from past mining practices, which changed the natural sinuosity, reduced the number of pool and riffle complexes, and removed spawning gravel. On many streams, bank trampling and width-to-

depth ratios are often excessive from long-term livestock use.

Factors Affecting Fisheries Habitat and Production

The factors limiting or affecting fishery habitat include excess siltation, stream dewatering from irrigation, riparian areas that are in less than proper functional condition, livestock impacts and past mining practices.

Factors limiting or affecting native fish production include non-native salmonid competition and predation, stream dewatering, hybridization, fish loss through irrigation diversions and excess siltation, lack of population connectivity.

In the Madison River, whirling disease is a significant negative factor in rainbow trout recruitment. In the Big Hole and Beaverhead Rivers, seasonal low flow and warm temperatures have a negative affect on quality habitat and trout production.

Sport Fisheries

Several nationally known rivers classified by the state of Montana as class 1 outstanding or "blue ribbon" waters based on their importance as fisheries are located in the planning area. They include the Big Hole, Beaverhead and Madison rivers. In addition, many smaller, less well known streams such as Big Sheep Creek, Bean Creek, Bear Creek, and other small creek fisheries are included in the "blue ribbon" classification due to high fishery values. The most popular fisheries in the planning area are located on the larger class 1 rivers. The larger rivers such as the Jefferson, Big Hole, Beaverhead and Madison Rivers are some of the most popular fishing destinations in the state. They provide in the neighborhood of 282,000 angler days of use per year (FWP 1999), attracting fishermen from around the world. Some of the more popular smaller streams, such as Big Sheep Creek provide up to 1226 angling days of use per year (1999 data). Of the 18 species of fish found in the planning area, the most sought after are rainbow trout, brown trout, brook trout and mountain whitefish. Many of the small streams support popular recreational fishing for small "pan sized" brook, brown and rainbow trout. There is no recreational fish stocking of the rivers and streams in the planning area. These waters are managed by the state as self-sustaining fisheries.

3.1.4 GEOLOGY

Laws, Regulations, and Policies

- Antiquities Act of 1906 (P.L. 59-209; 34 Stat. 225; 16 U.S.C. 432, 433)
- Federal Cave Resources Protection Act of 1988 (P.L. 100-691)
- National Environmental Policy Act of 1969 (P.L. 91-190; 83 Stat. 852; 42 U.S.C. 4321) the act is implemented by regulations of the Council on Environmental Quality, 40 CFR 1500-1508.
- Federal Land Policy and Management Act of 1976 (P.L. 94-579; 90 Stat. 2743; 43 U.S.C. 1701; "FLPMA")

Affected Environment

Geologic Features in the Planning Area

The planning area contains an extremely diverse and wide range of geology and geologic features. This area is very popular among students of geology, research geologists, mineral collectors, hobbyists and others seeking a variety of unique geologic formations within a close proximity.

Examples of some of the more interesting geologic features or areas in the planning area include Block Mountain and the surrounding area, the Hogback, the Big Hole River valley, the Madison River Valley and any one of the many mountain ranges. Many of these features draw professors, students and research scientists from all over the United States and the world to study these formations. There are a number of

colleges that make visiting these unique formations part of their regular field camp exercise.

The planning area contains numerous abandoned mines that provide opportunity to study and collect minerals from the associated waste dumps. There are also numerous areas that provide opportunities to collect a wide variety of different surface rocks and minerals. Many of these rocks and minerals are sought after as collector items, for decorative purposes, for manufacturing of jewelry and lapidary applications. People who use this resource range from commercial collectors to occasional weekend rock hunters. The planning area also contains some limited cave resources, though none are considered spectacular in comparison with caves and caverns located outside of Montana. Campbell (1978) reports 8 cave locations in Beaverhead County.

Geologic History

The oldest known rocks in southwest Montana, the Archean basement rocks, were laid down as sediments and volcanic flows more than three billion years ago. These rocks were subjected to repeated episodes of metamorphism (intense heat and pressure) over the next one and a half billion years. Much of the area subsided during a period extending from 1,500 to approximately 850 million years ago, causing a thick accumulation of sediments that over time solidified into the rocks of what is known as the Belt Series. The Belt Series includes quartzites, argillites, and limey-to-dolomitic argillites, which are metamorphosed sandstones and shales. The combined thickness of these formations exceeds 50,000 feet in some places.

For the next 750 million years, an ancient sea repeatedly advanced and retreated over much of Montana. Some areas were almost continually submerged; accumulating thick layers of sediment, while others periodically rose above sea level and were subjected to erosion. In some places, these marine sediments accumulated to a depth of several thousand feet overlying the older Belt Series rocks.

Approximately 100 million years ago the ancestral Rocky Mountains began to rise, causing the inland sea to retreat eastward. The mountain building process included folding and uplifting of the older sedimentary rocks, creating intense heat and pressure deep within the earth's crust. Molten masses of rock, known as magma began to form and rise through the overlying layers. Where fissures could open to the surface, volcanoes formed. In some areas, the rising magma may not have reached the surface, only causing the crust to bulge over the molten rock that eventually cooled to form huge granitic batholiths.

Magmatic activity, including intrusion of granites and volcanic eruptions, has continued right into recent times, evidenced by the fresh volcanic flows and active thermal features of Yellowstone National Park. The most intense period of volcanism occurred from 70 to 50 million years ago. Associated with this volcanism is an enormous swarm of dikes that trends northeast from central Idaho into west-central Montana. Deep accumulations of volcanic ash in southwestern Montana are also a result of this volcanic activity.

From 60 to 40 million years ago, Montana's climate was warm and moist. This was followed by a 20 million-year period of a cool, dry climate. Another period of a tropical climate followed, accompanied by dense jungle-like vegetation and formation of deep, lateritic soils.

The last dry spell began approximately 15 million years ago. The evidence suggests Montana's climate was very much like Death Valley and remained so until the first ice age began 2.5 million years ago. There is abundant evidence of glaciation during the ice ages in southwestern Montana. The last ice age ended about 12,000 years ago, very recent in geologic time.

The mountain ranges of southwest Montana are bounded by active faults that continue to generate earthquakes. There is a region of high seismic activity stretching from Helena to Salt Lake City and beyond, indicating continued

mountain building and movement.

The planning area is partially within the Rocky Mountain Overthrust Belt and partially within what is known as the Central Rocky Mountain Foreland Province. Both areas are considered highly prospective for oil and gas. Most of the drilling activity in southwest Montana in the past has been focused in the Foreland Province. The Rocky Mountain Overthrust Belt, also known as the Sevier Thrust Belt, is characterized by low angle thrust faulting. Huge slabs of older rocks were thrust eastward and ramped up and over younger rocks, burying the younger rocks underneath. East of this line, in the Central Rocky Mountain Foreland Province, thrust faults still occur, but they are at a much higher angle and involve basement rock (granite and Precambrian cores of mountains).

Mineral Deposition

Structural features within the earth's crust are some of the determining factors for mineral deposition. Montana's distinct geologic history has created a state with numerous diverse mineral-rich districts. Fissures caused by folding and faulting in the mountain building process served as pathways for the movement of mineralizing solutions upward from great depth. In and near these pathways valuable ores of copper, zinc, lead, gold, and silver were deposited. Other deposits are associated with granitic type intrusions where the valuable minerals are disseminated in small particles throughout the rock, located in contacts between the intrusions and the country rock, replace the country rock, or a present in associated veins. In many deposits, several different valuable minerals may be present. Erosion of mineralized areas has concentrated valuable minerals such as gold, sapphires, and rubies into economic placer deposits.

All the deposits in Montana yielding commercial quantities of metals lie in or near the mountain areas, particularly in southwestern Montana where igneous activity was most prevalent. The geologic age of nearly all the western Montana mineral deposits is about 50 to 60 million years, corresponding with the age of intense igneous activity.

3.1.5 PALEONTOLOGY

Laws, Regulations, and Policies

Paleontological (fossil) resources are natural resources that occur on public lands and are therefore managed in accordance with the requirements of several Federal laws, primarily the Federal Land Policy and Management Act of 1976 and the National Environmental Policy Act of 1969. Additional requirements for the use, management, and protection of paleontological resources on public lands are addressed in a series of Federal Regulations and Secretarial Orders, as well as by specific BLM manual guidance. Other guidance has resulted from key court decisions and Solicitor's Opinions.
Important legislation and other mandates and direction governing paleontological resource management on public lands include the following:

- Federal Cave Resources Protection Act of 1988 (P.L. 100-691)
- Federal Land Policy and Management Act of 1976 (P.L. 94-579)
- National Environmental Policy Act of 1969 (P.L. 91-190)
- Secretarial Order 3104 grants to BLM the authority to issue paleontological resource use permits for lands under its jurisdiction
- BLM policy for the management of paleontological resources is outlined in Manual Sections 8270.
- Title 43 CFR, Subpart 37 addresses protection of significant caves and cave resources, including paleontological resources.
- Title 43 CFR, Subpart 8365 addresses the collection of invertebrate fossils and, by administrative extension, fossil plants.
- Title 43 CFR, Subpart 3622 addresses the free use collection of petrified wood

as a mineral material for non-commercial purposes.

- Title 43 CFR Subpart 3621 addresses collection of petrified wood for specimens exceeding 250 pounds in weight.
- Title 43 CFR, Subpart 3610 addresses the sale of petrified wood as a mineral material for commercial purposes.
- Title 43 CFR, Subparts 3802 and 3809 address protection of paleontological resources from operations authorized under the mining laws.
- Title 43 CFR, Subpart 8200 addresses procedures and practices for the management of lands that have outstanding natural history values, such as fossils, which are of scientific interest.
- Title 43 CFR Subpart 8365.1-5 addresses the willful disturbance, removal and destruction of scientific resources or natural objects and 8360.0-7 identifies the penalties for such violations.

Affected Environment

The existing regulations, and policies address collecting of fossils on public lands. Hobbyists or "rock hounds" may collect invertebrate or plant fossils in reasonable quantities for noncommercial purposes without a permit, and up to 25 lbs. of petrified wood plus one piece per person per day, up to 250 pounds in a calendar year for personal use. Some areas may be closed for hobby collecting to protect scientifically significant invertebrate or plant fossils, or prevent other resource damage. Qualified paleontologists may obtain permits for collecting vertebrate fossils and other scientifically significant specimens. Specimens collected under the auspices of a permit remain the property of the federal government, and must be properly kept in qualified museum or university collections.

Description and Summary

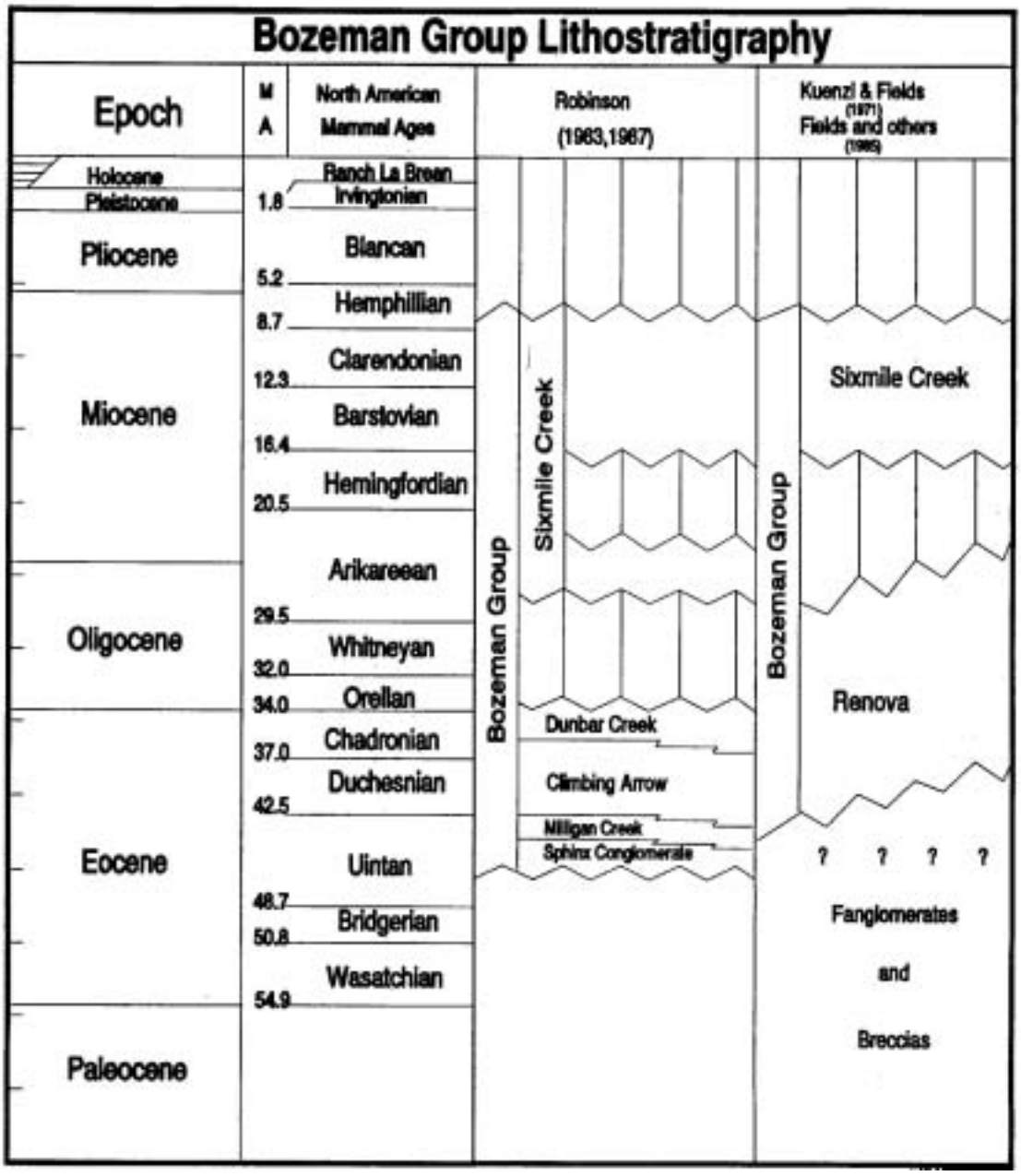
A recently completed Class I overview of paleontological resources listed 110 known vertebrate fossil localities on public lands in the planning area, clustered within five main areas (Nichols and Hanneman 2000). Other Tertiary vertebrate fossil sites no doubt remain to be discovered. Most localities produce only small fossils consisting of teeth and jaws, fragments of limb bones, and other small parts. Teeth are the hardest parts of a skeleton and therefore are the most commonly fossilized elements of an animal. Other dense bone portions, such as ends of limb bones and wrist and ankle-bones are also commonly preserved. Entire fossilized skeletons are extremely rare. Teeth and skulls are the most useful in identification and research since they are the most diagnostic.

Fossil materials in the planning area are within the Cenozoic Era, or the Age of Mammals, based on the ages of the geologic formations. More specifically, these formations, containing mammalian fossils, range in age from the mid Eocene to the late Miocene epochs of the Tertiary Period. This represents a span of time from approximately 50 million years to 7 million years before the present. Paleontologists have created a system to classify major evolutionary stages of mammals, referred to as North American Land Mammal Ages (NALMAs), which are typically named for geographic areas producing the benchmark faunas. Using this system, the mammal fossils found in the planning area indicate a range from the Bridgerian to the Hemphillian NALMAs (see **Figure 1**).

These fossil-bearing formations in the planning area are significant for a couple reasons. They represent some of the most northerly and westerly exposures of these deposits in North America. That helps to provide researchers with important information about variability of animal groups, as well as timing of extinctions and appearances, over large regions of the country. The planning area also represents one of the longest time sequences of the Cenozoic. Although other areas contain many more fossils and exposures, and provide a broader research

Figure 1. North American Land Mammal Ages Correlated with Lithostratigraphy

(from Hanneman and Wideman, 1991).



potential for a particular NALMA, this area is one of the few that offers an illustration of 50 million years of mammalian evolution (Tabrum, Prothero, and Garcia, 1996). That is useful because it allows for comparisons between different ages without having to consider the other effects of different regional environments, such as Central Plains vs. Rocky Mountains vs. Pacific Northwest.

Overall, mammalian fossils are found from most of the Cenozoic NALMAs in the planning area, with the exception of the earliest and latest periods. Presently, fossils are known from all intermediate ages except the Clarendonian, but that particular NALMA is relatively restricted elsewhere, so the lack of representation in the planning area is a minor point.

The mammal fossils and the enclosing geologic formations of this area document the slow climatic change from the warm, almost tropical environment present during the Bridgerian times to the more familiar cool temperate and dry environment of the Hemphillian. The fossils and sediments also illustrate the development of grasslands and the corresponding evolution among herbivores from primarily browsers to primarily grazers. This is evident by the development of generally higher tooth crowns and thicker enamel to withstand the wear caused by grazing on tough grasses.

The earlier NALMAs, such as the Bridgerian and Uintan, were characterized by mammals long extinct or quite foreign to the present North America fauna, such as brontotheres, rhinos, tapirs, oreodonts, tiny deer-like leptotragulids, and small three and four-toed horses. More familiar groups were also present, such as rodents and rabbits, although relatively primitive. The brontotheres, and a similar group, called amynodonts, were medium-sized mammals somewhat resembling modern rhinos or hippos. Some brontotheres developed spectacular slingshot-like nasal horns.

The mid-Cenozoic NALMAs saw the slow rise in relative numbers of the artiodactyls (even-toed ungulates) and decline of the perissodactyls (odd-toed ungulates), until the artiodactyls became the prominent group, as is the case today. A variety of artiodactyls developed, or diversified from earlier times, including oreodonts, camels, and leptotragulids. A number of primitive carnivores and insectivores were also present.

The Miocene NALMAs represented in the planning area (Hemingfordian, Barstovian, and Hemphillian) are relatively restricted in extent, but still provide important information about the changing mammal faunas. These groups are characterized by animals more familiar, although still forerunners of the modern representatives. Horses, camels, wolf-like carnivores, large cats, peccaries, rodents, rabbits, rhinos, and even primitive elephants were all represented.

Localities within the Sage Creek Basin probably contain the most abundant and varied deposits of fossils and certainly represent the greatest span of time. The Ruby Valley and Horse Prairie areas are also important with localities from several NALMAs present. Localities of various ages are also known from the Muddy Creek, Melrose, Beaverhead West, Jefferson, Grasshopper, and Blacktail drainages. Although patchy and restricted in overall size, these Cenozoic localities in the planning area produce significant fossils over a long range of time.

Paleontological Resources Condition and Trend

Interest in vertebrate fossils and the demand fueled by the high prices obtained for some fossil specimens have brought many people into the field wanting to collect. Specimens collected for sale to the public often lose their scientific value as the important associated data about location and context is not recorded or preserved. Additionally, the specimens are often not known by or available to the scientific community. Individuals untrained in proper paleontologic collecting techniques inadvertently destroy many significant fossils. Dirt bikes and ATVs have damaged some fossil localities (Nichols and Hanneman, 2000). Lands

administered by the BLM often have badlands topography or exposed bedrock, resulting in a higher potential for fossil localities to be discovered.

The condition and trend of paleontological resources in the planning area varies considerably due to the diversity of terrain, geomorphology, access and visibility, coupled with past and current land use patterns. Exposed fossil elements can be easily damaged by factors such as wind and water erosion, animal and human intrusion, natural deterioration, and development and maintenance activities. Evidence of vandalism or illegal collecting has been observed in limited instances in the planning area, but currently is not problematic. Impacts caused by development and maintenance activities (e.g. accelerated erosion attributable to some grazing, mining, and recreation activities) are known to be affecting certain localities.

Within the planning area, the "demand" for paleontological resources is thought to be low to moderate. This determination is based on the known research interests of professional paleontologists. The Montana State Office issues approximately two to three Paleontological Resources Use Permits to qualified researchers on an annual basis for the planning area.

3.1.6 SOILS

Laws, Regulations, and Policies

The BLM's Soil Resource Management Program is conducted under the following major authorities:

- The Federal Land Policy and Management Act of 1976(43 U.S.C. 1701 et seq.)
- Desert Land Act of 1877, as amended (43 U. S.C. 321 et seq.)
- Soil Conservation and Domestic Allotment Act of 1935, as amended (49 Stat. 163)
- Soil Info. Assistance for Community Planning and Resource Development Act of 1996 (42 U.S.C. 3271et. seq.)
- Soil and Water Resources Conservation Act of 1977 (16 U.S.C. 1901et. seq.)
- Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901 et. seq.).

Affected Environment

Soils and site capability are the foundations for ecological production assessment and response. Renewable resources depend upon the soil and climate, which provides the required nutrients and soil moisture for plant growth. This vegetation in turn provides for wildlife habitat, forage for grazing and browsing animals, and forests for recreation and wood products. Soils and their associated landscapes provide a place for trails and roads and provide the setting for riparian and wetland areas. The extent to which soil dynamics are understood is directly related to the ability to manage and protect this basic resource.

Soil at or near the surface has the highest organic matter and nutrient content, which generally controls the maximum rate of water infiltration. Soil surface loss (erosion) or degradation of part or all of the soil surface layer or horizon results in a loss of site potential (Dormaar and Willms 1998; Davenport et al. 1998). Two types of erosion affect the soils in the planning area—natural and accelerated. Natural erosion (geologic erosion) results from the wearing away of the earth's surface by water, ice, or other natural agents without human disturbance. Accelerated erosion occurs more rapidly than natural (geologic) erosion as a result of the activities of humans, and in some instances, animals. In general, vegetative cover helps reduce the rates of both natural and accelerated erosion.

Soils Inventory

A detailed soil survey is currently available for the lands in Madison County, published by NRCS in 1989 (Boast and Shlito 1989). Soils in the Beaverhead County portion of the planning area are currently being inventoried and classified by the NRCS, but this information is not yet complete or published. As a result, only general soil information derived from the The State Soil Geographic Database (STATSGO) is available for planning purposes in Beaverhead County (USDA, NRCS 1994). Statsgo data are not sufficiently detailed to make interpretations at the county level. (USDA,NRCS)

General Description

The planning area is generally characterized by broad valleys bounded by rolling foothill, which rise into steep mountain ranges. Soils across the planning area vary with local geology, topographic relief, and climate. Soils on flood plains and terraces are more than 60 inches deep and formed in loamy material deposited by water. All other soils vary in depth from less than 20 inches to more than 60 inches. Soils on lower elevation uplands and terraces were transported by wind or water or were formed from igneous and metamorphic rocks**.** Soils on higher elevation uplands formed in water deposited materials or from metamorphic rock. Soils on mountains are formed mainly from, glacial till or bedrock.

NRCS provides erosion hazard information in the mapping unit descriptions in the Madison County Soil Survey; these are not available for Beaverhead County. Erosion is one of the indicators of rangeland health that is examined while determining whether rangelands are healthy or functioning. Erosion indicators such as: rills, water flow patterns, pedestals and/ or terracettes, bare ground, gullies, litter movement, soil resistance to erosion and soil surface loss or degradation are reviewed. Generally soils on steeper slopes with longer slope length and less vegetative cover erode more rapidly than soils with flatter slopes, shorter slope length and more vegetative cover.

Mass movement has occurred in the past on public land throughout the planning area. The Madison County Soil Survey has limited information about mass movement. Special symbols shown as slips and slides can be found on some map sheets in this published soil survey. These symbols note where areas of mass movement have been observed by NRCS field soil scientists. The Beaverhead County portion of the planning area has no similar information about mass movement.

Hydric soils do exist in the planning area, though they are not extensive. Hydric soils are those that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

There are few if any prime farmlands in the planning area. Based on definitions provided by NRCS, prime farmlands constitute the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops. In general prime farmlands have an adequate and dependable supply of water, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air and are not excessively erodible or saturated with water for long period of time, and they either do not flood or are protected from flooding (USDA-Soil Conservation Service 1993).

Management Concerns

Soil management problems may arise in the planning area depending on a combination of factors including soil type, climate, geologic setting, and vegetative cover. Vegetation is sparse in much of the planning area due to the short growing season and distribution of effective moisture and doughtiness of some soils. Erosion and compaction are two important factors of concern in the planning area.

Overland flow and sediment transport into streams can be pronounced during intense

precipitation events or during periods of severe runoff or snowmelt events. In areas of limited vegetative cover, this transport is exacerbated. Soil compaction can occur due to repeated impact or disturbance of the soil surface over a period of time. Farm machinery, herbervoir trampling (Willat and Pullar 1983, Warren et al. 1986, Chanasyk and Naeth 1995), recreation and military vehicles (Webb and Wilshire 1983, Thurow et la. 1988), foot traffic (Cole 1985), or any activity that repeatedly causes an impact on the soil surface can cause a compaction layer. Compaction becomes a problem when it begins to limit plant growth, water infiltration, or nutrient cycling processes (Wallace 1987; Willat and Pullar 1983, Thurrow et al 1988; Hassink et al. 1993). Moist soil is more easily compacted than dry or saturated soil (Hillel 1998). However, some studies indicate recovery processes (e.g., earthworm activity and frost heaving) are generally sufficient to limit compaction by livestock in many upland systems. (Thurow et al 1988a.).

The physical condition of soil is assessed as part of the rangeland health evaluation process and during other activity and implementation level planning.

3.1.7 SPECIAL STATUS SPECIES

Introduction

Special status species are plants and animals that require particular management attention due to population or habitat concerns. There are five categories:

- Federally Listed Threatened and Endangered Species and Designated Critical Habitats
- Federally Proposed Species and Proposed Critical Habitats
- Candidate Species
- State of Montana Listed Species
- BLM Species of Special Concern (Sensitive Species)

Species management is reflected by individual species' designations and, except for state-listed and BLM sensitive, is directed by the mandates of the Endangered Species Act (ESA).

It is BLM policy to conserve threatened or endangered (listed) species and the ecosystems upon which they depend, to ensure that all actions authorized, funded or carried out by BLM are in compliance with the ESA, and to cooperate with the USFWS in planning and providing for the recovery of listed species. Proposed species will be managed essentially the same as listed species except that formal consultations are not required (BLM Manual 6840 Section .06.A,B). BLM will implement management plans that conserve candidate species and their habitats, and ensure that actions authorized, funded or carried out by BLM do not contribute to the need for the species to become listed (BLM Manual 6840 .06 C). The protection provided for candidate species will be the minimum level of protection provided for BLM sensitive species (BLM Manual 6840 .06.E).

Petitions for listing a species under ESA are filed with the USFWS where species information and status are reviewed, with a significant amount of public and agency involvement. The findings of that review are published as rulings in the *Federal Register* that may list a species as threatened or endangered. Candidate species are those for which FWS has sufficient information on species status that warrants listing the species as endangered or threatened but issuance of a final rule is currently precluded by higher priority listing actions. Proposed species have been officially proposed for listing as endangered or threatened but a final determination on listing has not been made. State-listed species are established by state legislation or regulation.

The BLM State Director designates sensitive species in coordination with State agencies responsible for fish, wildlife and plant resources, and State Natural Heritage Programs. These are species that:

- could become endangered in or extirpated from a State, or within a significant portion of its distribution;
- are under status review by USFWS;
- are undergoing significant current or predicted downward trend in habitat capability that would reduce a species' existing distribution;
- are undergoing significant current or predicted downward trend in population or density;
- typically have small and widely dispersed populations;
- inhabit ecological refugia or other specialized or unique habitats; or
- are State-listed but could be better conserved through BLM sensitive species status (BLM Manual 6840 .06 E).

3.1.8 SPECIAL STATUS SPECIES–FISH

Laws, Regulations, and Policies

- Endangered Species Act
- Montana Natural Streambed and Land Preservation Act
- Federal Land Policy and Management Act of 1976
- National Environmental Policy Act of 1969
- Fish and Wildlife Coordination act of 1958
- Water Quality Act of 1987, as amended from the Federal Water Pollution control Act of 1977
- Public Rangelands Improvements Act of 1978
- Sikes Act of 1974
- Wild and Scenic Rivers Act of 1968
- Executive Order 11514, Protection and Enhancement of Environmental Quality
- Executive Order 11988, Floodplain Management
- Executive Order 11990, Protection of Wetlands
- Executive Order 12962, Recreational Fisheries
- Montana Water Quality Act
- Streamside Management Zone Law
- Montana Stream Protection Act
- Fish And Wildlife Conservation Act of 1980
- BLM Manual 6840
- Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana (1999)
- Memorandum of Understanding Concerning Fluvial Arctic Grayling Restoration (2001)

Affected Environment

The westslope cutthroat trout and Montana arctic grayling are listed by the State of Montana as species of special concern and by BLM as sensitive species. The fluvial form of the arctic grayling is a federal candidate species. These two species are classified as special status species by state and federal agencies due to population size, amount of quality habitat available to them, and their current distribution within their native range.

BLM Sensitive Species

Westslope Cutthroat Trout

The westslope cutthroat trout *(Oncorhynchus clarki lewisi)* historically was wide spread throughout streams in western Montana. Due to hybridization and competition with non-native salmonids, habitat degradation and over fishing, genetically pure populations of this native trout have been reduced to about 1% of their historic range (USD-FS and USDI-BLM 1996:3). The DFO currently administers 135 miles of streams containing westslope cutthroat trout (WCT) populations with genetic purity greater than 90%. Additionally, there are 94 miles of streams containing populations with unknown or less than 90% purity within the planning area. To date, 32 pure (100%) populations are currently found on BLM lands in the planning area. BLM manages the headwaters or significant portions of the habitat for 15 of these

populations and smaller habitat segments for the remaining 17 populations. Currently the greatest threats to pure westslope cutthroat populations are hybridization by and competition with non-native trout species, and habitat degradation.

Candidate Species

Montana Arctic Grayling (Fluvial Population)

There are two life history forms of the Montana arctic grayling (*Thymallus articus montanus*) native to the planning area, the adfluvial and the fluvial form. Both forms are listed as a species of special concern by the state of Montana. The fluvial form is listed as a BLM sensitive species and as a candidate species by the USFWS. BLM currently has no special designation for the adfluvial form.

The fluvial form of arctic grayling is native only to the upper Missouri River drainage. It was once found in all three major tributaries of the Missouri River. It has since disappeared from approximately 95% of its historic range (Kaya 1990). Today, the Big Hole River contains the last strictly fluvial native population in the continental United States (Magee 2002). It is suspected that the major factors in the decline of this species are habitat alterations such as dams and de-watering of streams for irrigation, and introduction of non-native species (Vincent 1962; Kaya 1990). BLM currently has an assistance agreement with Montana FWP for fluvial grayling recovery.

State of Montana Species of Special Concern

Montana Arctic Grayling (Adfluvial Population)

The adfluvial form of arctic grayling is native only to the Upper Red Rock Lakes drainage. This is comprised of Upper and Lower Red Rock Lakes and Elk Lake. It has since been successfully introduced to lakes throughout the state of Montana. Historically, grayling in the Red Rock drainage used many of the tributaries entering the lakes for spawning. Today, they are confirmed in only three tributaries. Habitat degradation is thought to be the biggest contributor to their decline.

3.1.9 SPECIAL STATUS SPECIES–PLANTS

Laws, Regulations, and Policies

Special status plant species management on public lands administered by the BLM is authorized under and/or directed by the following laws, mandates, and guidance:

- Federal Land Policy and Management Act of 1976 (43 U.S.C.1701 *et seq.*), as amended
- Endangered Species Act of 1973 (16 U.S.C.1531 *et seq.*), as amended
- National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), as amended
- Title 43, Code of Federal Regulations, Parts 24, 1610 and 4180
- BLM Manual 6500 and 6840
- National and Montana BLM Policy

Affected Environment

Background

The Montana Natural Heritage Program (MTNHP) serves as the state's clearinghouse and principal source of information on species of concern, including those that are at-risk or potentially at-risk due to rarity, restricted distribution, habitat loss, and/or other factors. From the early 1990s through the present, the Dillon Field Office has partnered with the Montana Natural Heritage Program through challenge cost share projects to inventory, monitor, and conduct limited research on select populations of special status plants.

Areas within the Beaverhead Mountains Section (which includes most of the Dillon Field Office) have been the center of many plant surveys since the start of the Montana Natural Heritage Program and the start of the botany program in the Bureau of Land Management – Montana Office. Results from these studies have already been processed as element occurrence data, and synthesized as species status and biology information in the Biological and Conservation Data System, as well as cross-referenced in a supporting bibliographic database (Cooper, Jean and Heidel 1999). While certainly not exhaustive, the botanical surveys conducted by the MTNHP provide a sensitive species baseline for the Dillon Field Office. These surveys will aid in identifying conservation priorities and developing protection and compatible management strategies for these species.

Threatened and Endangered Plants

Regulatory aspects of the Endangered Species Act affect plants only when they occur on federal lands or are affected by federal actions. No plants in Montana are currently listed endangered, while three plants are listed as threatened. None of the listed plants are known from BLM lands in Montana, however one of them, Ute Ladies' Tresses (*Spiranthes diluvialis*) is known from private and state lands in Beaverhead, Madison, Gallatin, and Jefferson counties.

Special Status Plants

Special status or rare plants may be important indicators of change. They can also provide clues to past environments. In 1992 there were more than 1100 special status plants known or suspected to occur on BLM lands nationwide. As of 1996, there are 372 special status plant species listed for Montana BLM, 74 of these plants are listed for the Dillon Field Office, sixteen of which are designated as sensitive. In addition to the 16 BLM designated sensitive species, the Montana Natural Heritage Program tracks 23 plant species of special concern known to occur on BLM lands managed by the Dillon Field Office.

The Dillon Field Office currently maintains three lists of special status plants - sensitive species, watch species and dropped species. In order to be designated as sensitive, a plant or plant community must:

- Be proven to be rare by proper study(s).
- Be proven to be imperiled by proper study(s).
- Be documented on BLM surface.

The watch list includes plants or communities that are either:

- Known to be imperiled and is suspected to occur on BLM surface or,
- Suspected to be imperiled and has been documented on BLM surface or,
- Needs further study for other reasons.

Reasons for maintaining the dropped list are to document the fact that a species has already been studied and to retain the option of uplisting that species to the sensitive or watch list. Dropped species won't be discussed further in this document.

The thirty-nine special status plant species that are known to occur on public land administered by the Dillon Field Office are displayed in **Table 5**. The species status given by BLM, Montana Natural Heritage Program, and the Forest Service is also disclosed in the table (2001 list). Status Codes: S = Sensitive, W = Watch, S1 = Critically imperiled in Montana because of extreme rarity &/or other factors making it highly vulnerable to extinction, S2 = Imperiled in Montana because of rarity &/or other factors making it vulnerable to extinction, SH = Historical, known only from records over 50 years ago; may be rediscovered, SX = Believed to be extinct in Montana; historical records only

The majority of the special status plant populations found on public lands administered by the Dillon Field Office are located in southern Beaverhead County.

Table 5. Habitat and Occurrence Information for Known Special Status Plant Species in the Planning Area

Genus Species/(Common Name)	Habitat	BLM*	MTNHP	FS	# Of Occurrences in MT/DFO*
Agastache cusickii (Cusick's Horse-mint)	Dry, open, limestone talus slopes, often with sagebrush or mountain mahogany	S	S1	S	5/2
Aquilegia Formosa (Sitka Columbine)	Open woods and stream banks at mid-elevations		S1		≤8/1
Arabis fecunda (Sapphire Rockcress)	Open, rocky, slopes developed from calcareous parent material restricted to the contact zone with igneous rock	S	S2	S	20/2
Astragalus ceramicus var apus (Painted Milkvetch)	Sparsely vegetated sand dunes	S	S1		≤4/1
Astragalus convallarius var convallarius (Lesser Rushy Milkvetch)	Grasslands and open pine woodlands	W	S2		10/1
Astragalus scaphoides (Bitterroot Milkvetch)	Silty, often stony soil in sagebrush grasslands	S	S2	S	14/11
Astragalus terminalis (Railhead Milkvetch)	Sagebrush steppe and sparsely-vegetated grasslands	S	S2		13/9
Balsamorhiza macrophylla (Large-leafed Balsamroot)	Sagebrush steppe and grasslands	W	S1	S	5/1
Carex parryana ssp. idahoa (Idaho Sedge)	Moist meadows around seeps, ponds, or streams, usually associated with calcareous parent materials	S	S2	S	38/24
Cryptantha fendleri (Fendler Cat's-eye)	Open areas of sand dunes	W	S2		3/1
Draba globosa (Round-fruited Draba)	Moist, open, gravelly, often limestone-derived soil in the alpine zone	W	S1		4/1
Elymus flavescens (Sand Wildrye)	Sparsely-vegetated sand dunes	S	S1		1/1
Erigeron linearis (Linear-leaf Fleabane)	Dry, often rocky soil in sagebrush grasslands		S1		6/1
Eriogonum caespitosum (Mat Buckwheat)	Dry, stony limestone sagebrush steppe		S1		4/3
Hutchinsia procumbens (Hutchinsia)	Vernally moist, alkaline soil of sagebrush steppe	W	S1		4/1
Ipomopsis congesta ssp crebrifolia (Ballhead Gilia)	Open, often eroding sandy soil of sagebrush steppe		S2		4/3
Kobresia simpliciuscula (Simple Kobresia)	Moist tundra in the alpine zone		S1		11/1
Kochia Americana (Red Sage)	Saline or alkaline soil in valleys and foothills		S1		4/1
Lesquerella pulchella (Beautiful Bladderpod)	Gravelly, calcareous soils in sparsely vegetated mountain mahogany and limber pine woodlands	S	S2	S	12/7
Lomatium attenuatum (Taper-tip Desert-parsley)	Gravelly, limestone-derived slopes of sparsely vegetated sagebrush steppe or Douglas fir, limber pine, juniper, or mountain mahogany woodlands	S	S2		8/8
Lomatogonium rotatum (Felwort)	Alkaline meadows and fens	W	S1	S	2/2
Oenothera pallida var idahoensis (Pale Evening-primrose)	Sparsely vegetated sand dunes	S	S1		1/1
Penstemon lemhiensis (Lemhi Beardtongue)	Open sagebrush and woodland slopes	S	S2	S	82/10

Penstemon whippleanus (Whipple's Beardtongue)	Open, often rocky soil of dry meadows in the subalpine and alpine zones	S	S1		2/1
Phacelia incana (Hoary Phacelia)	Gravelly, limestone-derived slopes of mountain mahogany woodlands and sagebrush steppe	W	S2		7/7
Primula alcalina (Alkali Primrose)**	Moist alkaline meadows	W	SX		1/1
Primula incana (Mealy Primrose)	Alkaline meadows	W	S2		21/5
Puccinellia lemmonii (Lemmon's Alkaligrass)	Alkaline meadows		S1		1/1
Sphaeralcea munroana (White-stemmed Globe-mallow)	Open often calcareous soil of sagebrush grasslands		S1		5/3
Sphaeromeria argentea (Chicken Sage)	Shallow limestone-derived soil in sagebrush steppe	S	S2		13/10
Stellaria jamesiana (James Stitchwort)	Woodland slopes	W	S1		2/2
Stephanomeria spinosa (Spiny Skeletonweed)	Dry grasslands	W	S1		6/3
Taraxacum eriophorum (Rocky Mountain Dandelion)	Grasslands, sagebrush steppe, and open riparian areas and wetlands	S	S2		7/2
Thalictrum alpinum (Alpine Meadowrue)	Moist, alkaline meadows	S	S2		10/4
Thelypodium paniculatum (Northwestern Thelypody)	Wet, often alkaline meadows	S	SH		1 /1
Thelypodium sagittatum ssp sagittatum (Slender Thelypody)	Moist, alkaline meadows, often with greasewood or shrubby cinquefoil		S2		16/5
Thlaspi parviflorum (Small-flowered Pennycress)	Moist to dry meadows and limestone cliffs		S2	S	16/5
Townsendia condensate (Cushion Townsendia)	Open, rocky, often limestone-derived soil of exposed slopes and ridgetops in the alpine and subalpine zones.	W	S2		9/1
Townsendia florifer (Showy Townsendia)	Open soil on flats and eroding slopes of grassland and sagebrush steppe	W	S1		3/2

* The MTNHP database serves as the primary source of information for special status plant species locations in the Dillon Filed Office. With the exception of Alkali primrose, the number of occurrences within Montana and the Dillon Field Office record were obtained from the Montana Rare Plant Field Guide (MTNHP 2002).

****** Alkali primrose (*Primula alcalina*) which is currently classified as "SX" in Montana, was discovered on BLM lands in the Dillon Field Office in June 2002 (personal communication, Peter Lesica). Alkali primrose was previously thought to be extinct in Montana and was known only from eastcentral Idaho. Also known as Idaho primrose, *P. alcalina* has a global rank of G 1, which means it's critically imperiled because of extreme rarity and/or other factors making it highly vulnerable to extinction.

The highest concentrations of special status plants are found in three primary locations.

- Tendoy Mountains/Big Sheep Creek Basin
- SageCreek/ Centennial Valley/ Centennial Mountains
- Bannack Bench/Badger Pass/Rocky Hills

The general location of special status plant populations is shown on **Map 3.**

Current Situation and Habitat Conditions

Special status plants are found on a variety of habitats in the Dillon Field Office from the valley bottom riparian areas to the alpine tundra on top of the Centennial Mountains. While threats to some plant species may remain low due to the inaccessibility of the habitat they occupy, threats to other species will remain or increase due to unresolved resource conflicts.

Habitat and occurrence information for special status plants found on land managed by the Dillon Field Office is presented in **Table 5**. A

brief description of habitat condition or the major perceived threats to these habitats and the rare plant species they support follows.

All Habitats

Invasion of native habitats by noxious weeds and exotic species arguably poses the greatest threat to native plant species and communities. Eradication and/or controlling the spread of invasive plants is essential for the preservation/conservation of special status plant species; however, indiscriminate or broad scale application of chemical herbicides also threatens sensitive plant species.

Sagebrush Steppe and Grasslands

Invasion of this habitat by noxious weeds such as spotted knapweed (*Centaurea maculosa*,) leafy spurge (*Euphorbia esula*,) and houndstounge (*Cynoglossum officinale*) pose a serious threat to all native plant species. Other exotic species that compete for habitat with sensitive species include Kentucky bluegrass (*Poa pratensis*), which is invading mesic upland sites, and cheatgrass (*Bromus tectorum*), which is increasingly common on south facing slopes.

Palatable species of the sagebrush steppe, such as milkvetches (*Astragalus spp.)* remain at risk in heavily grazed areas especially in areas that are grazed in the spring. Grazing begins on fifty percent of the allotments in the planning area during the month of May or earlier. The two largest populations of bitterroot milkvetch in Montana are located on lands administered by the BLM that are grazed only during the non-growing season.

Sand Dunes

Natural processes (fire and grazing of both large and diminutive herbivores) are responsible for maintaining the seral conditions necessary for the perpetuation of various rare plant species and communities present in the sand dunes. The greatest threats to this landscape would be landscape fragmentation and the cessation of fire or mechanical disturbance (trampling and burrowing) that would allow successional processes to proceed to their endpoint and eliminate the sensitive seral species and communities (Cooper, Jean and Heidel 1999). Noxious weeds and other invasive exotics are not currently a problem in the sand dunes.

Limber pine, juniper and mountain mahogany woodlands including shallow, gravelly sites and talus slopes

Sensitive plants that inhabit shallow, gravelly soils, limestone talus, and steep slopes typically have low growth habits and/or are resistant to grazing. The current practice of placing livestock mineral or supplement on ridgetops may impact these species. Off-highway vehicle use, road construction, mining activities and invasion of exotic species such as spotted knapweed, cheatgrass, and sweetclover (*Melilotus* spp.) pose the major threats to sensitive species occupying these habitats.

Riparian areas and wetlands including alkaline and moist meadows

Rare plant species that inhabit riparian and wetland habitats are the most vulnerable under existing management since more than 80% of riparian habitats and 70% of wetland habitats in the DFO are functional–at risk or nonfunctional, based on BLM riparian inventory information. Under current livestock authorizations many of these habitats are heavily grazed.

While moderate grazing may enhance habitat for some rare riparian species, especially those that occupy relatively open soil on hummocks, heavy grazing and trampling can destroy habitat (Lesica and Vanderhorst 1995).

Heavy grazing also favors disturbance species such as exotics Kentucky bluegrass, dandelion (*Taraxacum laevigatum* and *T. officinale*) and redtop (*Agrostis alba*,) that compete with rare native species. Seventy percent of stream reaches inventoried for the Dillon Field Office by the Montana Riparian Wetland Research Program recorded canopies of “Disturbance-

increaser Undesirable Herbaceous Species" greater than 25%. (Bitterroot Restoration 2002.)

There is not any evidence indicates that individual populations of special status plants found in riparian and meadow habitat are increasing in size while several populations are in apparent decline under the influence of livestock grazing (Vanderhorst and Lesica 1994; Lesica and Vanderhorst 1995; Heidel and Vanderhorst 1996; Lesica 1998).

Private irrigation diversion and channel dewatering affects the hydrologic regime of some riparian and wetland habitats in the Centennial Valley and Big Sheep Creek Basin which in turn affects habitat suitability for some species.

Alpine, subalpine, and tundra

Rare plant species found in these high elevation habitats are not especially threatened, though some species may be susceptible to domestic sheep grazing, through their preference for forbs.

3.1.10 SPECIAL STATUS SPECIES–WILDLIFE

Laws, Regulations and Policy

Special status species management in the planning area is authorized under and/or directed by the following laws, mandates, and guidance:

- Bald Eagle Protection Act of 1940
- Eagle Protection Act of 1962
- Endangered Species Act of 1973
- Federal Land Policy and Management Act of 1976
- Fish And Wildlife Coordination Act of 1958
- Migratory Bird Conservation Act of 1929
- Public Rangelands Improvement Act of 1978
- Sikes Act of 1974, As Amended
- Taylor Grazing Act of 1934
- Clean Water Act of 1977
- Water Quality Act of 1987
- National Environmental Policy Act of 1969
- Emergency Wetland Resources Act of 1986
- Fish And Wildlife Conservation Act of 1980
- EO 11990, Protection of Wetlands
- EO 11988, Floodplain Management
- EO 11987, Exotic Organism
- EO 11989, Off-Road Vehicles
- EO 13186, Migratory Birds
- Interior Department Manual 520
- BLM Manual 1737 Riparian
- BLM Manual 6500 General Wildlife
- BLM Manual 6840 Special Status Species
- Pacific Bald Eagle Recovery Plan (USFWS 1986)
- Montana Bald Eagle Management Plan (USDI-BOR 1994)
- Grizzly Bear Recovery Plan (USFWS 1993)
- Northern Rocky Mountain Wolf Recovery Plan (USFWS 1987)
- Grey Wolf Experimental Reintroduction Ruling (USFWS 1994b)
- Whooping Crane Recovery Plan (USFWS 1994a)
- Peregrine Falcon Recovery Plan (USFWS 1977)
- Canada Lynx Conservation Agreement, June 2001
- Sage Grouse Conservation Memorandum of Understanding (July 2000)
- Memorandum of Understanding September 1994 - implementing Endangered Species Act.
- Memorandum of Understanding January 1994 - candidate species conservation
- Memorandum of Understanding August 2000 - streamlining programmatic Section 7 consultation and coordination

Affected Environment

Numerous high-priority Special Status Species are present in the planning area, ranging from grizzly bear and bald eagle to pygmy rabbits, loggerhead shrike and Townsend's big-eared bat. Habitats that support these species span most of the planning area but occupancy within those habitats may be very limited. MTNHP maintains a comprehensive list of these species in coordination with MDFWP, BLM, and Forest Service, although some discrepancies occur between agency designations. This list however does not include species distribution within the state. Comprehensive species distribution for many sensitive species is lacking. The most current BLM sensitive species list is Appendix G of the Rangeland Health EIS (USDI-BLM1996a) and has not been officially updated since 1996. Sage grouse are not formally on the Montana BLM list but current petitions for listing and a national interagency MOU is influencing management direction. The 2001 MNHP list includes several other species not currently on the BLM list. Special Status Species of wildlife in the planning area and their occurrences are listed in **Table 6**. This list is the basis for the short-form biological evaluation that provides documentation and determinations for proposed projects that may influence any special status species.

BLM lands in the planning area generally represent a minor portion of occupied and suitable habitat for currently-listed species but may provide important linkages through intermingled ownerships, particularly for gray wolves and grizzly. Management of listed species has had little impact on authorized actions in the planning area. Where constraints have occurred, they have been localized and may be only seasonal. Grizzly bear, lynx, and wolverine are dependent on large blocks of forested habitat and isolation that generally do not occur on BLM lands outside of the Centennial Mountains. However, where larger BLM forested areas adjoin Forest Service lands, potential occupancy by either species increases substantially as does potential constraints on authorized actions.

Recovery plans have been prepared by USFWS for most listed species that provide guidelines and standards that should be implemented to enhance species recovery. These guidelines most often apply within recovery zones or site-specific locations that are critically important to a species' reproduction and survival. More recent listings have developed conservation strategies rather than recovery plans but still provide a basis for controlling potentially adverse impacts. Information and guidance in these plans serve as the basis for biological evaluations and Section 7 consultations.

As new species are proposed or listed under the Endangered Species Act, very specific management consideration is required through a prolonged process. New emphasis focuses on conservation actions prior to or during the petition review process that could preclude the need for listing. Increased management emphasis for sensitive species can preclude the need for potential listings as well as addressing habitats where conservation actions could serve multiple species needs rather than implement single-species management.

No clear guidance is available for the implementation of conservation strategies for sensitive species. Conservation agreements have been signed by the BLM at the national and State levels for Canada lynx and westslope cutthroat trout and at the national level for sage grouse. The management actions associated with these agreements have not been subject to a NEPA process but represent best management practices developed by interagency teams of experts. Whether or not to incorporate these strategies into planning documents as standard management practices is unresolved.

Listed Species

Bald Eagle

Approximately 35-40 breeding territories are present in the DFO, primarily in the major river valleys. Breeding pairs utilize cottonwood habitat at lower elevations and Douglas-fir at higher elevations, in association with a permanent body of water. Approximately half of these territories include public land. Major

Table 6. Montana Special Status Wildlife Species in the Dillon Planning Area

List of all Special Status Species that are known or suspected to occur on the DFO	Current BLM –DFO Management Status of the Species	Beaverhead-Deerlodge NF Management Status of the Species *	Occurrence on public lands in the planning area *	Preferred habitat
Grizzly Bear (*Ursus arctos horribilus*)	Threatened	Threatened & MIS	T	Forest
Gray Wolf *(Canis lupus irremotus*)	Endangered in area west of I-15. Proposed threatened in experimental area east of I-15. Proposed for delisting	Endangered in area west of I-15. Proposed threatened in experimental area east of I-15, & MIS	T	All
Whooping Crane (*Grus americana*)	Endangered	Endangered	R	Wetland
Lynx (*Felis lynx*)	Threatened	Threatened	T	Forest
Bald Eagle (*Haliaeetus leucocephalus*)	Threatened. Proposed for delisting	Threatened. Proposed for delisting & MIS	R	Riparian/wetland, Forest
Mountain Plover (*Charadrius montanus*)	Proposed threatened	None	R	Grassland
Fisher (*Martes pennanti*)	Sensitive	Sensitive	T	Forest
Northern Bog Lemming (*Synaptomys borealis*)	Sensitive	Sensitive	R	Wetland, Bogs
Pygmy Rabbit (*Brachylagus idahoensis*)	Sensitive	Sensitive	R	Sagebrush shrubland
Preble's Shrew (*Sorex preblei*)	Sensitive	None	R	Sagebrush shrublands
Townsend's Big-eared Bat (*Corynorhinus townsendii*)	Sensitive	Sensitive	R	Forest, caves, tunnels, shafts
North American Wolverine (*Gulo gulo luscus*)	Sensitive (petitioned for listing)	Sensitive	R	Forest
Black-backed Woodpecker (*Picoides arcticus*)	Sensitive	Sensitive	R	Forest (recently burned)
Black Tern *(Chlidonias niger*)	Sensitive	None	R	Wetland
Boreal Owl (*Aegolius funereus*)	Sensitive	None	R	Forest
Burrowing Owl (*Athene cunicularia*)	Sensitive	Sensitive	T	Grassland
Columbian Sharp-tailed Grouse (*Pedioecetes phasianellus*)	Sensitive	Sensitive	T	Grassland
Common Loon	Sensitive	Sensitive	R	Wetland

(*Gavia immer*)				
Canvasback Duck (*Aythya valisneria*)	Sensitive	None	R	Wetland
Ferruginous Hawk (*Buteo regalis*)	Sensitive	None	R	Sagebrush shrubland
Great Gray Owl (*Strix nebulosa*)	Senstive	None	R	Forest
Hairy Woodpecker (*Picoides villosus*)	Sensitive	None	R	Forest Riparian/wetland
Harlequin Duck (*Histrionicus histrionicus*)	Sensitive	Sensitive	R	Riparian/wetland
Loggerhead Shrike (*Lanius ludovicianus*)	Sensitive	None	R	Sagebrush shrubland
Long-billed Curlew (*Numenius americanus*)	Sensitive	None	R	Grassland
Northern Goshawk (*Accipiter gentilis*)	Sensitive	Sensitive & MIS	R	Forest
Peregrine Falcon (*Falco peregrinus anatum*)	Delisted; Treated as sensitive .	Sensitive & MIS	R	Riparian/wetland, cliffs
Sage Sparrow (*Amphispiza belli*)	Sensitive	None	R	Sagebrush shrubland
Swainson's Hawk (*Buteo swainsoni*)	Sensitive	None	R	Riparian/wetland Sagebrush shrubland
Three-toed Woodpecker (*Picoides tridactylus*)	Sensitive	None	R	Forest
Trumpeter Swan (*Cygnus buccinator*)	Sensitive (petitioned for listing)	Sensitive	R	Wetland
White-faced Ibis (*Plegadis chihi*)	Sensitive	None	R	Wetland
Columbia spotted frog *(Rana luteiventris)*	Sensitive	None	R	Wetland
* R=resident for some part of annual life cycle, documented on or immediately adjacent to public lands. T=transient, only occasional occurrence on BLM lands MIS= Forest Plan Management indicator species				

winter concentrations occur in the same areas where open water and prey is available. Cooperative interagency monitoring is occurring through the Montana Bald Eagle Management Plan. Recovery efforts for bald eagle and restrictions around nests have had little effect on current land use authorizations. Bald eagles are currently proposed for delisting.

Current breeding population densities are probably approaching optimum, with little vacant habitat present in river bottom cottonwood types. Long-term stability of cottonwood habitat, and dependent bald eagle use, is uncertain as flood control on the Beaverhead, Red Rock and Madison Rivers, and other land uses, reduce the amount of cottonwood reproduction recruitement available.Most expansion of new breeding territories would be into conifer forested areas with relatively minor riparian/wetland habitats supporting them.

Grizzly Bear

Grizzly bear observations on public lands in the planning area have been rare until the mid 1990s, and were confined to the Centennial Mountains and areas adjacent to the Gravelly range as an extension of bear habitat in the Yellowstone ecosystem. The planning area is outside the Yellowstone grizzly bear recovery zone, and no critical habitat has been designated. The greatest benefit that public lands in the planning area provide for grizzly bear may be secure habitat and protection for animals moving between recovery zones. Recent grizzly observations have been made in the Centennial Mountains, Medicine Lodge and upper Horse Prairie. Although a female and cubs have reportedly been present in the Centennial Mountains, no resident occupancy has been established. Observations are associated with transient, short-term use that is usually limited by conflicts with existing land uses. Although these occurrences appear to be increasing, the likelihood of these areas being permanently occupied by grizzlies is slim. Expansion outside recovery zones would continue but if these bears are not considered as essential to recovery, the occupancy of much otherwise suitable habitat would be temporary. Some areas may become "mortality sinks" that absorb emigration from recovery zones. A supplemental conservation strategy and Section 7 consultation for grizzly bear in the Yellowstone ecosystem should be completed in late 2002 or 2003 and will identify status and management guidelines for bears occurring outside the Yellowstone recovery zone. A Montana state management plan has been developed that would direct grizzly management if future delisting were to occur (MFWP 2002).

Gray Wolf

Prior to the reintroduction of nonessential, experimental wolf populations in Yellowstone and central Idaho ecosystems in 1994, gray wolves were classified as endangered with the full protection of ESA. Under the reintroduction rules, wolves that are within the reintroduction area but are not within a national park or national wildlife refuge are treated as "species proposed for listing" or "threatened", rather than endangered, for Section 7 consultation purposes. Within the planning area, Interstate 15 serves as the boundary between the Central Idaho Experimental Wolf Population and the Yellowstone Experimental Wolf Population.

Long-term sporadic wolf observations had occurred in the Tendoy Mountains, Centennial Valley and Horse Prairie prior to Yellowstone reintroduction. Establishment of wolf populations in Yellowstone and central Idaho ecosystems increased wolf distribution, and at least five packs, and numerous individuals, have temporarily occupied public lands in the planning area. However none of these have been sustained due to livestock depredations and resulting control actions by APHIS-Wildlife Services. Widespread occurrences outside of primary recovery zones will continue to increase, as will wolf-livestock conflicts. Those will generally result in removal or relocation of offending wolves that precludes the potential establishment of stable packs in many areas. Grey wolf expansion and occupancy into extensive suitable habitat beyond existing recovery zones will be totally dependent on social acceptance. A Montana state management plan is being developed to direct wolf management after delisting.

The only formal Section 7 consultation process completed in the planning area was for wolf occurrence in a timber sale area in the west Big Hole in 1986.

Canada Lynx

No occupied lynx habitat has been identified in the planning area, and there have been no recent observations on public lands. No inventory efforts have been conducted on public lands while inventory efforts on FS lands in the Pioneer Mountains and the Gravelly Range have not documented lynx occurrence. Historic lynx observations have been made in the Centennial Mountains. Limited regional distribution of lynx reduces the likelihood that available, suitable habitat will be occupied. Potential Canada lynx habitat has been identified cooperatively with Beaverhead-Deerlodge NF using existing vegetation data and moist forest habitat types. Potential lynx habitat on public

lands is generally peripheral to more extensive habitat areas on Forest Service lands, with the only extensive habitat available on BLM lands occurring in the Centennial Mountains. Although some potential habitat is identified in the Ruby Mountains and Sweetwater Hills, these areas are not considered as manageable lynx habitat due to their isolation from other potential habitat. Similarly, small stands of forested habitat that meet vegetation criteria are mapped as potential lynx habitat but are too small to support anything other than temporary transient use. The Lynx Conservation Assessment and Strategy (Ruediger, et al. 2000) provides programmatic and project-level management guidelines for lynx conservation and is the basis for consultation determinations for all proposed projects. This document replaces the usual recovery plan issued for listed species.

Whooping Crane

Whooping cranes were cross-fostered with sandhill cranes at Greys Lake NWR in southeast Idaho in the late 1970's. A single male whooping crane has occupied wetland habitat in the Centennial Valley on Red Rock Lakes National Wildlife Refuge since 1981, occasionally occurring on public land wetlands below the refuge. No other whooping cranes that could establish a breeding pair have been verified in the area. The whooping crane recovery plan does not address this circumstance in southwest Montana.

Wetland habitat sufficient to sustain breeding whooping cranes is available. However without a specific effort to reintroduce additional birds, there is no viable population in the planning area, nor is there any potential to naturally establish a whooping crane population.

Proposed Species

Mountain Plover

Mountain plovers are usually found in association with prairie dog colonies, but also utilize short-grass habitat that has been heavily grazed. Mountain plover in the planning area utilize grassland areas on ridgetops and alluvial fans adjacent to the Jefferson River valley. Breeding plovers were confirmed from one site on private lands near Twin Bridges in 1992, 1994, and 1995, with some potential public land habitat between Twin Bridges and Melrose. Nearly all suitable habitat in planning area is on private lands (FaunaWest1991, Knowles and Knowles 1993, 1997).

Petitioned Species

Trumpeter Swan

The trumpeter swan is North America's largest waterfowl that survived near extirpation in the contiguous United States with the establishment of Red Rock Lakes NWR in the Centennial Valley in 1935. The tri-state resident breeding population in southwestern Montana, southeast Idaho and northwest Wyoming is the remnant of the historic breeding population. These swans are isolated from other Canadian and Alaskan breeding populations, and are dependent on the wetland habitat and isolation afforded by Red Rock Lakes NWR, Yellowstone NP and adjoining areas. This area supports a major portion of wintering birds from interior Canada. Breeding swans are dependent on perennial wetland areas with tall emergent vegetation. Preferred nest sites are typically on muskrat or beaver lodges, and are utilized every year. Winter habitat in the planning area is confined to portions of the Madison River, Odell Creek (Madison R. tributary), and warm springs on Red Rock Lakes NWR. Public land wetlands in the Centennial Valley below Red Rock Lakes NWR have provided a significant portion of Montana breeding territories for the tri-state population. These wetlands are vulnerable to degradation and loss due to irrigation diversions, livestock grazing, and human disturbance, particularly during periods of drought. Current trumpeter swan occupancy and production on these sites are well below long-term averages. Although the swan population trend has been slightly upward over the past ten years, a significant decline occurred during 2001.

A pending petition for threatened listing cites range-wide habitat losses, hunting mortality, and poor production in the tri-state population.

Sage Grouse

Several petitions for threatened listing were submitted to USFWS in 2002, citing significant habitat and population declines range-wide. Sage grouse have not been formally placed on the BLM sensitive species list. Sage grouse population and habitat discussions are found in the *Wildlife* section of Chapter 3.

Wolverine

Recent inventories indicate that wolverines may occur in small numbers on most of the larger forested areas in Beaverhead and Madison County on both Forest Service and BLM lands. Around larger blocks of habitat on Forest Service lands, BLM lands are peripheral and may only be occupied by wolverine intermittently. The Centennial Mountains and Blacktail Ridge provide yearlong habitat. Wolverines travel widely through subalpine forest areas, but are seasonally using some lower elevation, dry Douglas-fir habitat that previously was considered unsuitable for wolverine (Heinemeyer et al. 2001, Kelly personal communication 1992, Copeland personal communication 2000, 2002). Petitions for threatened listing were submitted in October 2002.

BLM Sensitive Species

Suitable habitat is available in the planning area to support all sensitive wildlife species. Improvement of wetland/riparian habitats to proper functioning condition would benefit all dependent species. Maintenance and improvement of sagebrush habitat to maintain a diversity of age and structure, with emphasis on older aged stands on public lands, would support sagebrush dependent species. Forest dependent species would benefit from maintenance of the widest range of structure and complexity in all habitat types.

Fisher

Fisher occur primarily in dense coniferous or mixed forests, including early successional forest with dense overhead cover (Thomas et al. 1993). Optimal conditions for this species are in large, interconnected forest tracts. A dense understory of young conifers, shrubs, and herbaceous cover is important in summer. Fisher are documented only on public lands in the Big Hole Valley but recent Forest Service inventory of lodgepole and spruce/fir forest in the Pioneer Mountains indicates more common occurrences of fisher that previously known.

Northern Bog Lemming

There is widespread distribution of this species but populations are localized. Population sizes are not known for any specific location, although nowhere does this mammal appear to be common. This lemming maintains a home range of probably less than 1 acre but is very sociable and may be found in small colonies. It occurs in sphagnum bogs, wet meadows, moist mixed and coniferous forests; alpine sedge meadows, krummholz spruce-fir forest with dense herbaceous and mossy understory, mossy streamsides (Clough and Albright 1987). Northern bog lemming is documented from lands in the Big Hole Valley immediately adjacent to public lands.

Prebles Shrew

This species occupies arid and semiarid shrub-grass habitat associations, with confirmed occurrences in the Centennial Valley sandhills (Hendricks and Roedel 2001, 2002).

Pygmy Rabbit

Pygmy rabbit distribution in Montana is an extension of the Great Basin ecosystem. Local occurrence is patchy, primarily in areas dominated by Basin big sagebrush (*Artemisia tridentata tridentata*) and Wyoming big sagebrush (*A.t. wyomingensis*) where plants occur in tall and dense clumps, and soils are relatively deep and friable (Orr 1940; Green and

Flinders 1980a,b; Weiss and Verts 1984). Pygmy rabbits are widespread in low numbers on public lands in southwestern Beaverhead County with greatest concentrations in the Bannack/Badger Gulch area (Rauscher 1997).

Townsends Big-Eared Bat

This bat commonly occurs in mesic coniferous and deciduous forests (Kunz and Martin 1982), but occupies a broad range of habitats. Only localized occurrences are documented in planning area but a comprehensive inventory is lacking.

Black-backed Woodpecker

This woodpecker is a resident of mature and old-growth boreal and montane coniferous forests with decadent trees, snags, and fallen logs. It is closely associated with recently-burned forest habitats and depends heavily on the larvae of wood-boring beetles (e.g., *Monochamus* spp.). In Montana, it is more abundant in lower elevation pine and Douglas-fir forests than in high-elevation subalpine spruce forests. This woodpecker is an uncommon resident in the DFO.

Black Tern

Black terns nest on floating plant matter, typically located in shallow water, close to open water or openings in stands of emergent vegetation. The instability of nests leaves them vulnerable to storms, wave action, and rapid water level changes. Black tern reproductive success fluctuates widely from year to year, depending on weather and water levels. Their success depends on relatively long lives, and flexibility in choice of nesting area. This makes protection difficult, because terns may use a particular marsh only occasionally, but when they do, it may be their only chance of success. Managed wetlands, where water levels and vegetative cover can be manipulated, are therefore the easiest places to reliably protect nesting habitat. In general, protection of remaining wetlands is the most important protective action necessary to maintain this inland tern (Novak 1992). This species occurs on perennial wetlands in Centennial Valley.

Boreal Owl

Boreal owls occupy dense coniferous forest, generally in mature, multilayered spruce-fir mixed forest, with thickets of alder, aspen, or stunted spruce, most commonly in proximity to open grassy areas and bogs. Nests are located in old woodpecker holes, natural cavity, or broken topped tree, and may be used in consecutive years. Boreal owls are documented on public lands in the Big Hole Valley, Medicine Lodge Creek and in the Centennial Mountains.

Burrowing Owl

Burrowing owls are residents of open grasslands and prairies, occasionally using open areas such as vacant lots near human habitation or airports. Nesting and roosting occurs in burrows dug by mammals, most notably in prairie dog towns. Burrowing owls have been documented in the planning area in the Centennial Valley, E.F. Blacktail Deer Creek and east of McCartney Mountain during migration. Breeding habitat may be available in areas of dense ground squirrel activity at lower elevation but is unquantified.

Columbian Sharp-tailed Grouse

Columbian sharp-tailed grouse are found in small numbers only in the upper Centennial Valley (Red Rock Lakes NWR) and upper Madison River valley. Apparent immigration from southeast Idaho has occurred only recently and may not result in permanent occupancy. Public lands could provide suitable habitat for sharp-tails in both of these areas.

Common Loon

Common loons occur on public lands in the planning area primarily during migrations, primarily on Lima Reservoir in the Centennial Valley. Nesting generally occurs on marshy portions of lakes with overhead cover to conceal

nests, relatively clear water, adequate fish and amphibian forage base, and relatively free of human disturbance. Although several small, higher elevation lakes in the planning area may meet these criteria, they may not be available for breeding use by loons due to lingering ice cover late in the spring.

Canvasback Duck

Canvasbacks are uncommon summer residents on larger deep-water wetlands, primarily in the Centennial Valley. These ducks nest in tall emergent vegetation in freshwater marshes, preferring areas where a complex variety of wetland size, permanency, and cover types is available. Nests may be located on old muskrat houses or on dry ground. Females typically breed in their natal area. Lima Reservoir provides secure molting habitat, and spring/fall migration habitat depending on ice cover.

Ferruginous Hawk

Ferruginous hawks are relatively common summer residents of sagebrush/grasslands in the southern half of the DFO. Habitat in Lima Sweetwater Breaks area north and east of Lima supports one of the highest density breeding populations of ferruginous hawks in North America. Nesting occurs on steep slopes, rock outcrops and low trees, often in close association with other raptors. Exposure of these nests makes them particularly vulnerable to disturbance and predation.

Great Grey Owl

Great gray owls occupy dense coniferous forest adjacent to small openings, meadows, and clearcut areas especially near water and wet meadows. Nests are usually placed in the top of large broken-off tree trunk, in old nests of other large birds (e.g., hawk nest), or in debris platforms from dwarf mistletoe, near bogs or clearings. Nests are frequently reused with the same pair returning to the same area in successive years. Great gray owls are common summer residents in moist forest habitat throughout the DFO, most commonly along the Continental Divide.

Hairy Woodpecker

This woodpecker occupies forest, open woodland, swamps, well-wooded towns and parks, and open situations with scattered trees. This woodpecker is most abundant in mature woods with large old trees suitable for cavity nesting, but is also common in medium-aged forests with a dense canopy (Bushman and Therres 1988). It uses tree cavities for roosting and winter cover; may excavate new cavities in fall to be used for roosting (Sousa 1987). This species is an uncommon resident in lower elevation forests in DFO.

Harlequin Duck

This duck nests along fast-moving rivers and mountain streams on rocky islands or banks (Cassirer et al. 1993). It requires relatively undisturbed, low gradient, meandering mountain streams with dense shrubby riparian areas (greater than 50% streamside shrub cover), and woody debris for nesting and brood rearing, and mid-stream boulders or log jams and overhanging vegetation for cover and loafing. The presence of this species is an indicator of high water quality (Spahr et al. 1991). Harlequin ducks tend to breed in the same area in successive years. This species is a rare summer resident in the Centennial Valley but has not been inventoried area-wide.

Loggerhead Shrike

This shrike is a summer resident in sagebrush grassland habitats in DFO. Shrub structure is a key component to reproductive success but has not been adequately described in Montana (Rauscher 1999). Northern shrike generally replaces this species during winter months.

Long-Billed Curlew

This species occupies prairies and grassy meadows, generally near water. It nests in dry prairies and moist meadows. Nests are on the

ground usually in flat area with short grass, sometimes on more irregular terrain, often near rock or other conspicuous object. In Wyoming, it often nests near a manure pile if available (Cochran and Anderson 1987). This species is a common summer resident in the DFO.

Northern Goshawk

Goshawks are fairly common in the planning area with breeding territories widespread throughout the area in Douglas-fir and lodgepole forest adjacent to openings and riparian areas. A multi-year Challenge Cost Share project using radio telemetry indicated that long-range dispersal and seasonal movements occur for both adult and juvenile goshawk. A pattern of depressed nesting activity and low nest success indicates a need for more intensive, long term study to better evaluate the causes of the observed reproductive fluctuations (Kirkley 2001).

Peregrine Falcon

This falcon utilizes various open habitats where there are suitable nesting cliffs. When not breeding, it occurs in areas where prey concentrate, including farmlands, marshes, lakeshores, river mouths, tidal flats, dunes and beaches, broad river valleys, cities, and airports. Peregrine falcon were delisted under the ESA in 1998. Hacking activities in the Centennial Valley were conducted with the Peregrine Fund from 1981 through 1987. This effort released over 100 fledgling peregrine falcons that expanded throughout the region, and were instrumental in the eventual reocccupancy of many historic habitats in western Montana. Three hack towers and two natural sites in the Centennial Valley are currently occupied. Hack sites in the Valley bottom are relatively accessible while wild sites in the Centennial Mountains are remote and inaccessible.

Sage Sparrow

The sage sparrow prefers semi-open habitats with shrubs 1-2 meters tall. Habitat structure (vertical structure, shrub density, and habitat patchiness) is important to habitat selection (Martin and Carlson 1998). Habitat use is positively correlated with big sagebrush (*Artemisia tridentata*) cover, bare ground, above-average shrub height, and horizontal patchiness, and negatively correlated with grass cover (Rotenberry and Wiens 1980; Wiens and Rotenberry 1981). Population declines in some regions, and the degradation and loss of breeding and wintering habitats are concerns. This species is vulnerable to loss and fragmentation of sagebrush habitat, and may require large patches for breeding. This sparrow is documented in western Beaverhead County but lacks a comprehensive inventory.

Swainson's Hawk

Swainson's hawks typically nests in tall riparian shrubs in sagebrush grassland habitats in the DFO. Interspecific territoriality may occur with red-tailed hawk and ferruginous hawk in some areas and may be limited by presence of and predation by great horned owl (Palmer 1988). Swainson's hawks have been relatively common summer residents but have shown declines in occurrence during recent years. This raptor is a long-range migrant, traveling to southern South American during the northern winter.

Three-Toed Woodpecker

The three-toed woodpecker inhabits boreal forests. In some areas (Colorado, Montana, and British Columbia), there is enough potential habitat available for this species. This species is documented in the planning area but lacks comprehensive inventory.

White-Faced Ibis

This species occurs in freshwater wetlands with tall emergent vegetation or floating mats of vegetation. Ibis are uncommon summer resident in the planning area on wetlands in the Centennial Valley, Beaverhead River and Madison River Valleys, but is common is southeast Idaho.

Columbia Spotted Frog

This frog is highly aquatic and is rarely found far from permanent quiet water. Populations are generally uncommon in the large, intermountain valleys. It may disperse into moist forest, grassland, and shrubland habitats during wet weather. Breeding is in shallow ponds or other quiet waters, with most of the eggs masses placed in the same location at the margin of a pond, making them vulnerable to exposure if water levels drop. Spotted frogs are the most common frog in western Montana, and are common in riparian and wetland habitats in southern and western Beaverhead County (Roedel and Hendricks 1998).

Tailed Frog

This frog occupies clear, cold swift-moving mountain streams, primarily in older forest sites. Roedel and Hendricks (1998) suggested that tailed frog should be considered a species with very localize distribution in Montana. Although common west of the Continental Divide, their status east of the Divide is uncertain (Maxell 2000). It is not confirmed to occur in planning ara but anecdotal information describes tailed frog in the Dyce Creek area and suitable habitat is available in several areas.

Consultation and Coordination

Section 7 of the ESA emphasizes interagency cooperation to implement conservation actions for listed species, prohibits federal agencies from jeopardizing continued existence of a species or its critical habitat, and require federal agencies to confer with FWS on any actions that may jeopardize a proposed species or adversely modify its critical habitat. The need to initiate a consultation is usually determined by BLM and is based on an analysis of whether a listed species or its habitat may be affected by the proposed action. Informal consultation with FWS is required to evaluate the level of impacts and whether suitable alternatives are available, and determine if formal consultation is necessary. If BLM determines that a proposed action may affect but is not likely to adversely affect a listed species, BLM may conclude consultation with written concurrence from FWS. If adverse effects to a listed species/critical habitat are anticipated, formal consultation will be initiated by BLM. BLM policy requires that formal conferencing will occur with FWS for actions that may adversely affect a proposed species/critical habitat although this step is not required by ESA (BLM Manual 6840 .21E4). Formal consultation with FWS is initiated by BLM with a written request and submission of a Biological Assessment that describes the proposed action and anticipated direct and cumulative impacts. FWS reviews this documentation to determine if the action will jeopardize the continued existence of a species or its critical habitat, result in an incidental take (loss) of animals, and if appropriate conservation recommendations or alternatives are available. These conclusions are then submitted to the BLM in a Biological Opinion. BLM's final decision then implements or modifies the proposed action as necessary, based on FWS recommendations. This consultation process can take place at any BLM planning level (Resource Management Plan, activity plan, site-specific plan) using programmatic, batched, or project-specific strategies.

Formal consultations have been rare for the planning area due to limited occurrence of listed species or their habitat on public lands, and limited impacts from management activities. A biological evaluation format was jointly developed with Beaverhead-Deerlodge NF in 2001 that provides minimum documentation of impacts to Special Status Species from proposed actions.

The Dillon MFP is not in conformance with the lynx conservation strategy, and will be replaced by the ongoing Dillon RMP that will include formal Section 7 consultation. Listing of the Canada lynx as threatened in 2000 required the evaluation of all existing land use plans and current authorizations for compliance with the lynx conservation strategy, in consultation with FWS. Informal consultation on current authorizations occurred through the Level 1 Biologist Team with all other federal agencies. The effects determinations for DFO

authorizations using a series of screens developed by the Level 1 Team received FWS concurrence. The lynx conservation strategy and these screens provide guidance for assessing potential impacts to lynx habitat from all future actions.

A new procedure for streamlining Section 7 consultations with FWS has been developed under the national fire/fuels management initiative, and has been expanded to include some other activities. This process utilizes a set of screens that identify specific project activities and impacts for each listed species. It assures programmatic concurrence from FWS on "No Effect" and "Not Likely to Adversely Affect" projects, if they are designed and implemented consistent with screening criteria. Review of low impact federal actions through this process can meet informal consultation requirements and "automatic" concurrence from FWS with a minimum of project-specific detail and documentation.

Monitoring

Bald eagle and peregrine falcon territories and nests have been monitored annually through state management plan implementation. Grizzly bear observations have been documented when available but no area-wide monitoring or inventory has been conducted. Wolf observations were documented and submitted to FWS prior to the experimental reintroduction. Since the reintroduction, wolves have been intensively monitored by FWS. Information on wolf distribution and denning activities has not been directly disseminated to other agencies. Control actions conducted by APHIS Wildlife Services to eliminate livestock depredations have removed two wolf packs (one of which was denning on public land) and several individuals from public lands in the experimental area. No inventory work has been conducted on public lands administered by BLM in the planning area for Canada lynx or whooping crane.

Comprehensive sensitive species inventories have not been conducted for most species. Habitat availability and occupancy has been documented on an area-by-area, and species-specific basis rather than mapping overall distribution. Occurrence records from Montana Natural Heritage Program provide the only data for the presence of some sensitive species.

Sage grouse leks and some sage grouse winter habitat have been well-defined. Population trends have been based on male attendance on leks, although this monitoring was intermittent until recently. An ongoing radio telemetry project has identified sage grouse movements and key habitat areas in part of the planning area.

Three raptor transects have been monitored with Montana FWP for over twenty years. Raptor nest occupancy and production, primarily for ferruginous hawks, has been monitored in portions of the Lima/Sweetwater key raptor area.

Trumpeter swan distribution and production monitoring is conducted by Red Rock Lakes NWR.

Localized information on sage grouse, pygmy rabbits, loggerhead shrike, ferruginous hawk, northern goshawk, wolverine, Townsend's big-eared bat, and amphibian/reptiles has been collected through Challenge Cost Share partnership projects.

3.1.11 VEGETATION– FORESTS AND WOODLANDS

Laws, Regulations and Policy

The management of BLM forests and woodlands is directed by the following laws, regulations and policies:

- National Environmental Policy Act of 1969
- Federal Land Policy and Management Act of 1976
- Water Quality Act of 1987
- Clean Air Act

- State of Montana Best Management Practices Law of July 1991
- 43 CFR Group 5000 (Forest Management, General)
- 43 CFR Group 5400 (Sales of Forest Products)
- 43 CFR Group 5500 (Non-Sale Disposals)
- Public Domain Forest Management Policy of 1989
- Total Forest Management Initiative of June 1992

Affected Environment

Forest Communities

Forests are directly influenced by the physiographic effects of having the Continental Divide on three sides of the planning area. Precipitation in the planning area is greatest along the Continental Divide with average annual precipitations of 30". Precipitation decreases proportionally with distance from the Divide to 10" or less in the area around Dillon. It begins to increase again in the vicinity of the Madison Valley.

The forest/woodlands communities generally begin from 5,500' elevation on north facing slopes and extend upwards to 9,500' where timber line habitats replace the upper limits of conifer forests. As moisture increases with elevation, forest stocking and biomass productivity increases up to 8,000'- 8,500'. Above approximately 8,500' biomass begins to decrease due to colder average temperatures.

The forests are typical of the drier, intermountain region of the Northern Rockies. The forested communities from lower (or drier aspects) to higher (or more moist aspects) elevations are Limber pine/Rocky Mountain juniper, Douglas-fir, lodgepole pine, subalpine fir/ Engelmann spruce/whitebark pine. Distribution is also affected by aspect. South facing slopes are often non-forested to sparsely stocked woodlands up to 8,000' depending upon soil type and the effects of predominant south to southwest winds during the growing season. Aspen communities are relatively minor in area but an important component on the landscape for wildlife values. They are generally found where past disturbances and sufficient soil moisture occur.

Forest Communities and Structures

Table 7 is a generalized display of the acres of forest communities from lower to higher elevations, the percentage of each community and the amount of each type located both inside Wilderness Study Areas (WSAs) and outside WSAs. This distinction is made as acreage within WSAs is managed under BLM's Interim Management Policy for lands under wilderness review and treatments must be limited to those that will not impair the wilderness characteristic.

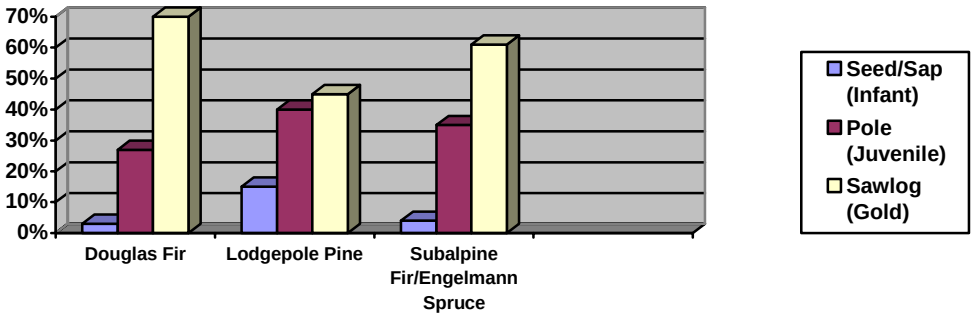
Approximately 83% of forested lands are predominantly Douglas-fir or a mix of Douglas-fir and lodgepole pine. These communities are primarily found in the lower to mid elevation forested lands in the planning area. Upper elevation forested lands are primarily managed by the Forest Service. Depending upon aspect, elevation, and soil types some mid elevation species groups will normally have an unclassified mix of subalpine fir and Engelmann spruce. This is especially noticeable in stands that have not undergone some disturbance in the past 50 years or more. Douglas-fir and lodgepole pine are also found in some upper elevation communities that have undergone some type of disturbance in the past century.

Figure 2 shows the approximate structure distribution of the major species groups in the DFO. The largest proportion is sawlog (mature) or "Gold" size classes. This reflects a lack of major fire or human generated disturbances in the past 80 to 100 years. The smaller proportion of pole size or "Juvenile" structures reflects the influx of in-growth that began with the advent of fire suppression from the late 1800's. The smallest size class, seedling/sapling or "Infant" indicates the relatively small proportion of lands in the planning area that have been treated by either single age class harvest activity or have

Table 7. Acres and Percentages of Forest Communities in the Planning Area

Primary Forest Species	*Acres/% of Forest Type Relative to All Forest Acres**	*Acres/% of Forest Type in Wilderness or WSAs*	*Acres/% of Forest Type outside of WSAs*
Lowest Elevation/ Warmest & Driest (Limber pine, Rocky Mountain Juniper, DF and DF encroachment)	2,699 acres/ 1.81%	618 acres/ 22.90%	2,081 acres/ 77.10%
Lower Elevation/Warm and More Moist (Primarily Douglas-fir)	78,497 acres/ 52.60%	32,131 acres/ 40.93%	46,366 acres/ 59.07%
Low to Mid Elevation/Cool and Increasing Moisture (Primarily Douglas-fir and lodgepole pine)	37,601 acres/ 25.20%	15,857 acres/ 42.17%	21,744 acres/ 57.83%
Mid to Upper Elevation/Cooler and Moist (Primarily sub alpine fir, Engelmann spruce and Whitebark pine)	21,929 acres/ 14.69%	15,830 acres/ 72.19%	6,099 acres/ 27.81%
Aspen	8,507 acres/ 5.07%	1827 acres/ 21.48%	6,680 acres/ 78.52%
Total Acres	**149,233**	**66,263 (44.40%)**	**82,970 (55.60%)**

Figure 2. Forest Structure Distribution of Major Species Groups in the Planning Area.



been subjected to stand replacing wildland fire events or other disturbances.

Forest Health

Evidence of past natural and human caused disturbances is commonly found throughout the landscape in southwest Montana. Historic fire occurrences have been well documented through fire studies. Fire events were more common up through the end of the 1800's. With the beginning of domestic livestock grazing and the increasing number of settlers, fire had less fine fuel, reducing rapid rates of spread. It also had a higher probability of being extinguished by these settlers. Evidence of varying types of timber harvest from the late 1800's through the present can be found on most forested lands. In some areas such as Bannack and Virginia City, the influence of large populations and intensive mining activity is evident in the surrounding landscape. In other areas away from these influences, settlers and miners utilized wood products for smaller mining operations, homes, barns, fences and fuel wood, taking only the size classes needed for the project at hand. Small openings created by this less intensive harvest pattern as well as the continuation of fire events were re-seeded by adjacent trees.

The reduction in large fire events as a result of fire suppression coupled with the tolerance of Douglas fir has resulted in more seedlings being established in the understory of lower to mid elevation woodlands and forest than would have occurred historically. This in-growth has continued to slowly grow and increase in numbers. Today, the "normal" condition of low to mid elevation forests with a Douglas-fir component is stagnated. Vigor and growth are very limited due to increased competition for water. Nutrients are "locked up" by in-growth that would normally have been killed by frequent low severity (cool) ground fires. These fires would usually benefit the older, overstory trees by recycling the nutrients contained in the smaller understory trees and reducing competition for nutrients and available water during the growing season.

These overcrowded stands have little to no growth in diameter, decreased ability to resist insects or pathogens, and increasing mortality in all size classes. When wildland fire does occur in these stands, it spreads more easily to the overstory or oldest trees due to the thick understory. Stand replacing fires in Douglas-fir communities were relatively rare prior to the late 1800's, but are now occurring with more frequency.

Mid to upper elevation forests are generally the transition zone from Douglas-fir to lodgepole pine, Englemann spruce, sub-alpine fir, and eventually whitebark pine. Higher elevation stands usually have longer fire intervals. However, with the effects of 60 or more years of "modern" fire suppression, some of these forest types are beginning or have reached the upper limit of their normal fire cycle. Accumulating biomass of dead or downed woody materials poses the greatest threat for abnormal soil heating when these stands do burn.

Research being done by the National Biological Service and others indicate local populations of whitebark pine may become extinct due to the whitepine blister rust or other agents. This tree species plays an important role in the life cycle of some birds and mammals. Whitepine blister rust is also affecting limber pine.

Insects and Disease

Spruce budworm has gone through several epidemic cycles that have periodically thinned stands of Douglas-fir, subalpine fir, and in some cases, Engelmann spruce. The persistent drought conditions for the past several years favors these insects. Another cycle started in 2002 in the Centennial Mountains.

Mountain Pine beetle has gone through several minor cycles since the last planning period. The majority of this was in lodgepole pine in the Madison Valley and affected relatively minor amount of BLM lands. At the present time a major infestation is causing lodgepole pine mortality in the Centennial Mountains. There is

also some evidence of endemic populations beginning to increase in the Gravelly Range. Western Balsam bark beetle has been endemic throughout the planning area in mid to high elevation subalpine fir stands. Some of these populations also show signs of increasing.

Disease such as dwarf mistletoe is commonly found in lodgepole pine stands. Root and or stem rots are endemic in a variety of species. These are common on rocky soils or in areas which had light to moderate ground fires which created "cat faces" or scars on the lower bole area of trees.

Site Productivity

Site productivity of forested land is a function of elevation, aspect and soil types. One method of measuring this is the cubic feet of wood biomass produced on an acre of land per year. Wooded areas that produce less than 20 cubic feet/acre/year are considered woodlands. Those areas that produce more than 20 cubic feet/acre/year are considered forest

Another characterization of site productivity is by using habitat types as developed by Pfister, Kovalchik, Arno and Presby. This is a land classification based upon potential natural vegetation of forests if they are left in an undisturbed state for long periods of time. Since the planning area has a wide variety of elevation, aspect and precipitation it has a correspondingly wide variety of habitat types. These habitat types have been grouped by temperature and precipitation regimes to simplify their use across the East Side of the Continental Divide. **Table 8** shows the habitat type groups found in the planning area and some examples of individual habitat types from Pfister's publication.

Fire Groups mentioned in the table are groups of habitat types that respond in a similar fashion to the influence of fire on forest succession. Historically, Fire Groups 1, 4, 5, and 6 had a low severity fire once every 5 to 40 years. This is referred to as a fire cycle. Fire Groups 7 through 10 had much longer intervals between fire events. These intervals could be as short as 35 years to as long as 500 years between fire events or fire cycle. The fire events could range from low severity to stand replacing events.

3.1.12 VEGETATION–RANGELANDS

The DFO manages the public lands administered by the Bureau of Land Management in Beaverhead and Madison counties. The planning area encompasses 5.8 million acres of which BLM manages approximately 900,000 acres or 15.5%. The majority of the BLM lands in the planning area (98%) are within the Beaverhead Mountains section of the Middle Rocky Mountains province as described by Baily (Nesser et al. 1997). A small amount (1%) of the land is within the Belt section of the same province, additionally an equally small portion is within the Yellowstone Highlands section of the Southern Rocky Mountains province.

Laws, Regulations, and Policies

The major legislation and other mandates and guidance directing natural resource land management, including rangeland vegetation include:

- Taylor Grazing Act of 1934 (43 U.S.C. 315)
- Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701)
- The Public Rangeland Improvement Act of 1978 (43 U.S.C. 1901 et seq.)
- Executive Order 12548, Livestock Grazing Fees
- Executive Order 13112, Invasive Species Control
- 43 CFR 4100 (Grazing Regulations)
- Federal Noxious Weed Act of 1974 (P.L. 93-629) (As amended by section 15 Management of Undesirable Plants on Federal Lands, 1990)
- Carlson-Foley Act (P.L. 90-583)
- Northwest Area Noxious Weed Control Program Environmental Impact Statement (USDI-BLM 1985)

Table 8. Summary of Forest Habitat Type Groups in the Planning Area

East Side Habitat Type Group	Temperature and Precipitation Characteristics of HTG	Acres of Habitat Type Group	Examples of Habitat Types found within DFO (See USFS GTR INT-34 May 1977)	Range of Yield Capacity Classes in HTG in Cu. Ft./Ac/Yr.	Fire Group that HTG Falls Within	Remarks
A	Warm & Very Dry	14,578	040,051,070,210	Very Low to Low(<30)	1,4	Most common on Woodland setting, common in DFO
B	Warm & Dry	42,984	320,323,330	Low to Moderate (25 to 70)	5,6	Generally the transition zone from wood land to forest setting, common in DFO
C	Warm & Moist	700	260	Low to Moderate (40)	___	Relatively rare in DFO
D	Cool & Moist	476	470	Low to Moderate (50 to 80)	7	Less common in DFO
E	Cool & Wet	34,517	410,650	Low to Moderate (40 to 70)	9	Common in upland riparian areas
F	Cool & Moderately Moist	23,732	730,732	Low to High (40 to 90)	7	Common in DFO
H	Moderately Cool & Dry	4,716	750,780	Low to High (30 to 90)	8	Common in DFO
I	Cold & Moist	2,050	820	Very Low to Low (15 to 50)	10	Generally, the upper limits of continuous forest cover, common in DFO
J	Cold & Dry	25,480	850	Very Low to Low (10 to 30)	10	Timberline, common in DFO

Generally, HTGs A, B, C and H have missed 2 or more fire cycles. Douglas-fir is the normal climax tree species on most of these sites. Lodgepole pine is normally the dominant tree in HTG F. Lodgepole pine stands were maintained by moderate to severe fire event(s) or other disturbance. Without such disturbances, lodgepole pine will eventually be replaced by Douglas-fir or subalpine fir. HTGs D, H, I and J are usually dominated by subalpine fir or Engelmann spruce until stand replacing fire events reverts these stand to seral lodgepole or whitebark pine. Most areas of HTGs D, F, H, I and J are on the latter stages of their current fire cycle.

- Supplement to the Northwest Area Noxious Weed Control Program Final Environmental Impact Statement (USDI-BLM 1987c)
- Vegetation Treatment on BLM Lands in Thirteen Western States Final Environmental Impact Statement (USDI-BLM 1991a)
- Noxious Weed Control in the Butte District - EA MT 070-86-01 (USDI-BLM 1986)
- Noxious Weed Control in DRA - EA MT-076-94-18 (USDI-BLM 1994)
- Implementation of Requirements for Noxious Weed Seed Free Forage on Public lands in Montana - EA MT-001-EA97 (USDI-BLM 1997)

Affected Environment

Upland Vegetation

The upland vegetation in the planning area has been subject to livestock use for over 100 years. The past intensity has influenced today's current condition and vegetation communities.

The plant community classification work conducted by the MTNHP (Cooper, Jean and Heidel 1999) has identified 480 plant associations in the state of Montana. Over half of these associations occur in the Beaverhead Mountains section. The Beaverhead Mountains section comprises less than one tenth of the state's total land area. This level of concentration of community diversity is unusually high. The primary reasons for this diversity are that the region exhibits the greatest geological diversity in the state, contains the most vertical relief, is situated within a unique intersection of Pacific and Gulf of Mexico storm tracks, and contains an overlap of several floristic elements. Additionally, the Beaverhead Mountains Section has received more sampling inventory than anywhere else in the state, which can add to the diversity.

While additional plant community inventory has not been completed on the ground since the Mountain Foothills EIS (USDI-BLM 1980), a satellite vegetation analysis has been completed.This analysis was based on the USFS Region One Eastisde SILC3 classification, which is a satellite imagery interpretation of vegetation completed in the late 1990's. Additional BLM data and ground truthing was provided for a reclassification of the SILC3 classification. This process improved the accuracy of the non-forested vegetation types over the SILC3 classification. The satellite vegetation classification identified covertypes for various grass and shrub densities. The reclassification did not adjust the timber covertypes from the SILC3 project. While the satellite classification does not allow an exact comparison from the Mountain Foothill EIS some general conclusions can be drawn. A summary of the vegetation cover types from the satellite classification is found in **Table 9**.

The sagebrush and grassland plant communities dominate the vegetation (82%) on lands managed by the BLM and has changed little since the Mountain Foothills EIS. While not directly comparable, data from the satellite imagery suggests a slight increase (8%) in sagebrush dominated plant communities and a slight decrease (9%) in the grass dominated plant communities. The BLM has also been conducting evaluations of individual grazing allotments. The individual allotments that have been evaluated demonstrate that overall, the upland rangeland condition is improving slightly.

The sagebrush communities are the most abundant with over 58% of the area being in this community type. The most common sagebrush species are basin big sagebrush, mountain big sagebrush and Wyoming big sagebrush with lesser amounts of black sagebrush, threetip sagebrush, and early low sagebrush. There are also areas of curl-leaf mountain mahogany. The understory is grass dominated with bluebunch wheatgrass, Idaho fescue, western wheatgrass, blue grasses, and needle-and-thread grass.

The basin big sagebrush/grassland vegetation

Table 9. Vegetation Cover Types from Satellite Imagery Classification			
Acres	**Code**	**Description**	**Type**
124,624	3130	very low grass 10-34% grass <5% sage	Grassland
87,441	3150	Low/mod grass 35-64% grass <5% sage	
8,849	3170	mod/high grass >65% grass <5% sage	
Total Grassland Acres = 220,914 22.8%			
8,162	3301	mountain mahogany	Shrub
185,112	3380	low cover sage 15-24% shrub	
93,775	3390	mod cover sage 25-34% shrub	
77,934	3395	high cover sage >=35% shrub	
122,081	3550	very low sage low grass 5-14% shrub 10-24% grass	
56,926	3560	very low sage mod grass 5-14% shrub >=25% grass	
Total Shrub Acres = 543,990 56.2%			
4,655	3610	Mesic shrub/willow	Willow
Total Willow Acres = 4,655 0.5%			
8,576	4101	Aspen	Woodland
684	4150	mixed broadleaf	
2,351	4214	Juniper	
176	4205	Limber pine	
221	4244	mixed xeric conifer	
Total Woodland Acres = 12,008 1.2%			
34,107	4203	Lodgepole pine	Forest
6,354	4204	Whitebark pine	
22	4206	Ponderosa pine	
79,756	4212	Douglas fir	
3,491	4223	Douglas fir/lodgepole	
71	4230	Douglas fir/ponderosa	
3,928	4237	Subalpine fir/spruce	
5,844	4241	mixed upper subalpine fir	
5,847	4242	mixed lower subalpine fir	
Total Forest Acres = 139,420 14.4%			
520	2010	agriculture dry	Agricultural
224	2020	agriculture irrigated	
Total Agricultural Acres = 744 >0.1%			

498	5000	Water	Water
8,147	7300	Rock	Rock/Mines
11	9100	Snow	Snow
37,807	0	Unclassified	Unclassified
Total Miscellaneous Acres = 46,463 4.8%			
Total Acreage = 968,194 100%			

type is found in moister areas of the lower to nearly level slopes and terraces at 5,900 to 7,200 feet. The soils are deep, silty to loamy soils. The parent material is alluvium derived from limestone and quartzite. The shrub canopy cover ranges 10 to 50 percent. The grass cover ranges from 40 to 70 percent and is dominated by Idaho fescue, blue bunch wheatgrass, and needle-and-thread grass.

The mountain big sagebrush/grassland communities are found on gentle and moderate slopes and terraces to steep slopes.

The soils are generally loam to silt or clay texture. The elevation generally ranges from 6,000 to 8,000 feet and has a shrub canopy cover of 20 to 50 percent. The grass cover ranges from 40 to 70 percent. The major grass species are basin wildrye, bluebunch wheat grass and Idaho fescue. The basin wildrye sites are found on the gentle to moderate slopes and terraces with warm aspects, deep soils and very mesic moisture regimes (Cooper, Jean and Heidel 1999).

The Wyoming big sagebrush/grassland communities are found on gently sloping alluvial fans and terraces at 5000 to 7500 feet. Soils are silt in texture. The shrub cover is 10 to 30 percent with a 30 to 60 percent cover of grasses. The dominant grasses are bluebunch wheatgrass, Idaho fescue, prairie June grass and thick spike wheatgrass.

The grass communities are the second most abundant with approximately 24% of the area being in this community type. The most common grass species are bluebunch wheatgrass, Idaho fescue, western wheatgrass, blue grasses and needle-and-thread grass with lesser amounts of tufted hair hairgrass, giant wildrye, thickspike wheatgrass, and blue grama. The bunchgrass types of Idaho fescue and bluebunch wheat grass are generally found above 6,000 feet while the more mesic types of needle-and-thread are found below 6000 feet.

Noxious Weeds

In Montana, as well as in other western states, noxious weeds are considered the single most serious threat to natural habitats. Noxious weed invasion contributes to the loss of rangeland productivity, increased soil erosion, reduced water quantity and quality, reduced species and structural diversity, loss of wildlife habitat, and in some instances, is hazardous to human health and welfare, as emphasized in the Federal Noxious Weed Act of 1974 (PL 93-629) (As amended by section 15 – Management of Undesirable Plants on Federal Lands, 1990). Some weed species pose a significant threat to multiple-use management of public land.

Noxious weeds are impacting Montana's economy and environment. There are currently 23 Montana State designated noxious weeds. The noxious weeds are divided into three priorities based on the status of the weed in the state. These include non-established new invaders (Category 3), established new invaders (Category 2) and those that are wide spread in the state (Category 1). **Table 10** lists by category the Montana state designated noxious weeds, along with those weeds designated by Beaverhead and Madison Counties as noxious and assigned to Category 4.

Federal and State laws make the Federal government responsible for control of weeds on Federal lands and provide direction for their control. The DFO operates under the protocols

Table 10. Montana State Designated Noxious Weeds			
Common Name	**Scientific name**	**WSSA 5-ltr code***	**Known Occurrences in the DFO?**
Category 1			
leafy spurge	*Euphorbia esula*	EPHES	Yes
Canada thistle	*Cirsium arvense*	CIRAR	Yes
Russian knapweed	*Centaurea diffusa*	CENRE	Yes
spotted knapweed	*Centaurea maculosa*	CENMA	Yes
diffuse knapweed	*Centaurea diffusa*	CENDI	Yes
field bindweed	*Convolvulus arvensis*	CONAR	Yes
hoary cress (whitetop)	*Cardaria draba*	CADDR	Yes
Dalmation toadflax	*Linaria dalmatica*	LINDA	Yes
St. Johnswort (goatweed)	*Hypericum perforatum*	HYPPE	No
sulfur cinquefoil	*Potentilla recta*	PTLRC	Yes
common Tansy	*Tanacetum vulgare*	CHYVU	No
Ox-eye Daisy	*Chrysanthemum leucanthemun*	CHYLE	No
Houndstongue	*Cynoglossum officinale*	CYWOF	Yes
Category 2			
dyer's woad	*Isatia tinctoria*	ISATI	No
purple loosestrife	*Lythrum salicaria*	LYTSA	No
tansy ragwort	*Senecio jacobea L.*	SENJA	No
tall Buttercup	*Ranunculas acris*	RANAC	No
Tamarisk (saltcedar)	*Tamarix ramosissima*	TAARA	No
meadow hawkweed	*Hieracium pratense*	HIECA	No
orange hawkweed	*Hieracium aurantiacum*	HIEAU	No
Category 3			
yellow starthistle	*Centaurea solstitialis*	CENSO	No
common crupina	*Crupina vulgaris*	CJNVU	No
rush skeletonweed	*Chondrilla juncea*	CHOJU	No

Category 4 (County Designated)			
musk thistle	*Carbuus nutans*	CRUNU	Yes
yellow toadflax	*Linaria vulgaris*	LINVU	No
field scabious	*Knautia arvensis*	KNAAR	Yes
black henbane	*Hyoscyamus niger*	HYSHI	Yes
common mullein	*Verbascum thapsus*	VESTH	Yes
common teasel	*Dipsacus fullonum*	DIWSI	No
*Weed Science Society of America coding system			

set forth in the plans, policies, and guidance listed above.

Noxious weeds are present throughout the planning area. The weed management program continually changes as a result of new weed introduction, additional inventory and the ongoing implementation of weed management projects. The Dillon Field Office uses a full range of integrated pest management in the planning area. The basic management of noxious weeds in the state and the Dillon Field Office are:

- Early Detection and Rapid Response (Newly Invading Species);
- Containment and Management (Widespread Weed Infestations);
- Inventory, Monitoring and Evaluation; and
- Public awareness, education and outreach.

The control methods used include chemical, mechanical (hand pulling, and mowing), biological (insects, diseases and grazing), and cultural (revegetation, management to enhance plant communities).

In general, road corridors are the main areas of infestation, however infestations are not limited to roads as some populations have been located well away from roads. Weed infestations can occur or spread when seeds are spread by human activities such as road maintenance and recreation activities, or when carried by livestock or wildlife, or dispersed by water or wind. In addition, ground-disturbing activities provide open sites for weeds to invade. Noxious weed control is completed using contracts with Beaverhead and Madison Counties as well as our own field office staff. The most common chemicals used for control and eradication of noxious weeds is Picloram and 2,4-D. Other chemicals or control methods are used as site conditions change and often several treatment methods are used for the same infestation.

3.1.13 VEGETATION–RIPARIAN AND WETLANDS

Laws, Regulations, and Policies

Riparian vegetation management on public lands administered by the BLM is directed by the following laws, mandates and other guidance:

- Federal Land Policy And Management Act of 1976
- Public Rangelands Improvement Act of 1978
- Taylor Grazing Act of 1934
- Clean Water Act of 1977
- Water Quality Act of 1987
- National Environmental Policy Act of 1969
- Emergency Wetland Resources Act of 1986
- Fish And Wildlife Conservation Act of 1980
- EO 11990, Protection of Wetlands
- EO 11988, Floodplain Management

- EO 11987, Exotic Organisms
- EO 13186, Migratory Birds
- Montana Water Quality Act
- Montana Streamside Management Zone Law
- Montana Stream Protection Act
- Interior Department Manual 520 – riparian habitat
- BLM Manual 1737 – riparian habitat
- BLM Manual 6500 - wildlife, fish and plant resources
- BLM Manual 6840 – special status species
- Fish and Wildlife 2000 - National and state policies

Affected Environment

Riparian Habitat

Riparian habitats in the planning area are generally dominated by willow or aspen communities along foothills streams, and usually represent stringers of habitat extending below forested areas into sagebrush/grassland habitat. The majority of public land riparian habitat is between higher elevation habitats on National Forest lands and lower elevation private lands in the major river bottoms. BLM lands provide most of the foothill/sagebrush steppe riparian areas that are available for public use. Habitats occur on wetlands and streams throughout the area at elevations from approximately 4,500 feet to alpine areas over 9,000 feet. Riparian communities vary significantly from small, sedge-dominated wetlands to large, willow-dominated stream corridors to spruce bogs and alpine wet meadows. Riparian aspen communities are scattered on streams and springs. Riparian vegetation communities found in Montana are described in Hansen, et al. (1995) and Cooper, et al. (1995, 1999). Relatively few extensive wetland areas or large river floodplain habitats occur on public land. The most extensive wetland habitat in the planning area is located in the lower Centennial Valley, Big Sheep Creek Basin, and the Axolotl Lakes area. Riparian and wetland communities around springs, seeps and pothole ponds in sagebrush habitats represent important small islands of habitat diversity as well as valuable water sources. Riparian plant communities support significant consumptive uses in the planning area such as livestock grazing and hunting, and nonconsumptive uses such as camping and wildlife viewing. Riparian habitats receive a disproportionate amount of wildlife use with approximately 75% of all wildlife species utilizing riparian areas for at least some portion of their annual life cycle (EPA 1990).

The extensive willow and aspen habitats that historically supported beavers have been significantly reduced, and many watersheds are no longer capable of sustaining stable beaver activity. While there are localized populations of beaver, stable colonies have declined substantially since the 1970's and long-term recolonization is not occurring. This precludes opportunities for riparian restoration that could otherwise be achieved by beaver activity. The loss of this keystone species and the habitat that it creates for numerous other wildlife species has reduced biological diversity.

Function and Condition

All riparian habitats are dependent on a balanced combination of physical (streambank, channel, soil characteristics), hydrologic (regular occurrence of surface water), and vegetative (hydrophytic communities) components. When any of these three components—soils, water, and vegetation—are negatively affected, the functional capacity of a riparian habitat may be degraded. Riparian-wetland areas are properly functioning when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows and flooding, thereby reducing erosion and improving water quality. Vegetation filters sediment and aids in floodplain development, improving floodwater retention and groundwater recharge. Deep soil-binding root masses stabilize streambanks against erosion. Stream channels develop to provide diverse ponding and channel characteristics that support enhanced water quality, fish production, waterfowl breeding, and

greater biodiversity (USDI-BLM 1991c). The Standards for Rangeland Health establish proper functioning condition as the minimum standard for BLM management of riparian-wetland areas. Management objectives may establish a desired future condition that extends beyond basic proper functioning condition.

Riparian areas are dynamic and extremely responsive compared to upland habitats. Variations in seasonal water flows influence the productivity and density of riparian vegetation and channel development. Flooding is an essential part of system development and stability. Minor habitat changes are normal and are part of the resilience of the riparian ecosystem. The ability of a system to withstand major disturbances is dependent on the integrity and balance of streambank, hydrology, and vegetation components. Degraded conditions in any of those components can result in impacts that may be beyond habitat capability to withstand or repair following a major flood or other disturbance. The combined effects of small scale, repeated degradation cause incremental declines in functional condition and increase vulnerability to further degradation. Riparian losses do not imply that the habitat disappears but that it supports a different set of capabilities ands uses. Altered potential however does imply a progressive, often permanent, decline in habitat complexity, productivity and diversity. A comprehensive description of riparian system function and characteristics specific to southwest Montana is found in the Beaverhead Forest Plan Riparian Amendment (USDA-FS 1997a).

The BLM Riparian Initiative for the 1990's established goals for management of riparian/wetland habitats on public lands to:

- Restore and maintain riparian-wetland areas so that 75% or more are in proper functioning condition by 1997.
- Protect riparian-wetland areas and associated uplands through proper land management and avoid or mitigate negative impacts. Acquire and expand key areas to provide for their maximum public benefit, protection, enhancement and efficient management.
- Ensure an aggressive riparian-wetland information outreach program
- Improve partnerships and cooperative restoration and management processes in implementing this riparian-wetland initiative.

An extensive literature base is available describing riparian values, functions, inventory and monitoring methods, and guidance for achieving riparian habitat goals and objectives. Montana-specific strategies and best management practices are provided in Ehrhart and Hansen (1998), and MDNRC (1995, 1996, 1999). Management strategies and recommendations applicable to the planning area are provided in Myers (1981, 1987, 1989a, 1989b), Hockett and Roscoe (1993), Beaverhead-Deerlodge National Forest (USDA-FS 1997a), and Bengeyfield and Svoboda (1998).

There are 914 miles of lotic (flowing water) riparian habitat currently identified on public lands in the planning area. This does not represent a comprehensive total of all riparian habitat. Estimates of functional conditions of streams and wetlands in the planning area are displayed in **Table 11**. Function assessments are based on Montana Riparian Wetland Association (MRWA) health assessments using intensive inventory data, MRWA short form inventories, other inventory methodologies, photo trend plots, and professional judgment. Intensive MRWA inventory has been conducted on approximately half of the stream miles. The BLM PFC checklist method (Prichard 1993) has been used on fewer than 10% of the stream miles in the planning area. Only 163 of 914 miles (18%) of riparian habitat are in PFC, mostly due to reduced woody canopies and lack of regeneration, herbaceous plant composition dominated by shallow-rooted species such as Kentucky bluegrass, and overwidened stream channels. Many functional-at-risk (FAR) riparian areas are still within site potential but are being sustained in disturbance-caused, disclimax vegetation communities that may take decades to convert.

Table 11. Functional condition of streams and wetlands in the Planning Area

	Proper Functioning Condition (PFC)	PFC %	Functional-at-risk (FAR)	FAR %	Nonfunctional (NF)	NF %
Stream riparian (miles)	163	18	536	59	215	23
Wetlands (acres)	525	26	1326	65	187	9

There are approximately 2050 acres of lentic (standing water) wetland habitats recorded on public lands.in the planning area. Wetland habitats have not been comprehensively inventoried (Prichard 1994), and numerous small wetland areas exist throughout the

acres of off-channel habitat. Relatively few extensive wetland/wet meadow complexes are present on public land. The major portion of wetland habitat in the planning area is on the shoreline of Lima Reservoir in the Centennial Valley, and Ruby Reservoir where annual drawdown of water levels precludes the development and maintenance of shoreline and littoral vegetation. Other extensive wet meadow/wetland habitats occur in Big Sheep Creek Basin , at Axolotl Lakes and in the Centennial Valley. Wetland enhancement projects developed through Intermountain Joint Venture partnerships have created approximately 185 acres of enhanced wetland habitat. The Monida Creek DU project on Lima Reservoir will provide an additional 42 acres of shallow wetland habitat when constructed.

Riparian Monitoring

Extensive riparian habitat inventory and vegetation trend monitoring has occurred since 1980. Prior to 1989, most information focused on woody vegetation characteristics and active bank erosion. Montana Riparian Wetland Association inventory methodologies were developed in 1989 using existing Dillon inventories as a base, and led to the development

planning area that have not been identified. Habitat is classified as lentic only if it is associated with standing water or small closed basins. Wetland habitat associated with springs, seeps and streams has not been documented separately from stream habitat assessments, even though some of these areas contain substantial of a comprehensive inventory focusing on vegetation, soils and hydrology. This inventory supports a health assessment that describes the functional condition of a stream reach. This methodology was adopted as the Montana BLM standard during the 1990's. This inventory method has been utilized on approximately half of the identified stream reaches in planning area with most of the work completed between 1992 and 1996. Reassessments to identify progress toward achieving PFC have been selected from this database and conducted on approximately 20 miles of stream.

Riparian coverboard monitoring transects are used to monitor trend for palatable deciduous woody vegetation, and have been a primary tool, along with function assessments, for evaluating riparian management effectiveness in allotment evaluations. Over 700 of these studies have been established and monitored since 1980 (Myers 1987a). Quantifiable data and photos are collected at several photo points for each transect. Most transects have been duplicated at least twice, some several times, and have been very useful in documenting trend in riparian vegetation communities.

Thirteen small riparian exclosures were constructed in 1981, and 1982 to provide comparison areas on various riparian habitat types. Paired transects with Daubenmire

studies, macro-plots, and photo points, monitor woody and herbaceous vegetation characteristics inside and outside each exclosure. Stream channel cross-sections have also been established on these exclosure studies. All exclosure studies have been duplicated at least once and have documented some significant habitat changes.

Influences on Riparian Habitat

Livestock grazing is the most widespread activity that influences riparian habitat conditions in the DFO. Mining activity, roads, timber harvest, dispersed recreation and localized wildlife impacts also affect the functional capability of riparian/wetland areas. The cumulative effects of overlapping uses complicate the effectiveness of applying management constraints to a single activity to achieve riparian objectives.

Private irrigation diversion and stream dewatering are major constraints on achieving proper functioning condition on some public land riparian and wetland habitats, particularly in the Centennial Valley and Big Sheep Creek Basin.

Altered habitat potential has occurred on many riparian areas where channel alteration has lowered the water table and reduced the extent of riparian habitat. This has altered riparian vegetation communities and allowed the encroachment of upland herbaceous species, sagebrush, and juniper. Overcrowded woodland and forest conditions could be contributing to less water yields and shrinking riparian zones in some areas, particularly in drought cycles.

3.1.14 VISUAL RESOURCES

Laws, Regulations, and Policies

Visual Resource Management (VRM) on public lands administered by the BLM is directed by the following laws and guidance:

- Federal Land Policy and Management Act of 1976
- National Environmental Policy Act of 1969
- Surface Mining Control and Reclamation Act of 1977
- BLM Manual 8400 and 8411
- BLM Manual Handbook H-8410-1

Affected Environment

BLM's VRM program attempts to balance the uses of public lands with the protection of areas containing high scenic values. Scenic quality is an essential component of most recreation activities. Recent studies indicate Americans enjoy a wide variety of outdoor activities that depend on high quality visual resources. According to several sources, recreation/tourism activities are a major component of the local, regional, and statewide economy. The University of Montana's Institute for Tourism and Recreation Research recently conducted a survey of out of state visitors. Over 30% of the people who responded to the survey indicated the reason for making Montana their vacation destination was for the uncrowded, wide-open spaces and the mountains and streams.

Background

The visual resources of the planning area were inventoried and classified in accordance with procedures outlined in the BLM Handbook 8410-1 before and during preparation of the 1979 Management Framework Plan (MFP). Prior to the MFP, BLM personnel conducted a visual resource inventory and analysis of the entire planning area. This inventory identified and quantified visual values and provided an overall description and relative value by rating scenic quality, visual sensitivity and distance zones. This resulted in the assignment of all lands in the planning area to one of five Visual Resource Inventory classes. These classes did not establish management direction but were used as part of the information to establish Visual Resource Management classes (see below). A Class V rating was applied to areas where the natural character of the landscape had

been disturbed to a point where rehabilitation would be needed to bring it up to one of the other four classes. Since then, Class V was eliminated from the rating system for visual resource inventory. Areas previously assigned to Class V in the planning area were mined areas and were reassigned to Class IV.

Visual Resource Inventory Classes

Class I is assigned to those areas where a management decision has been made previously to maintain a natural landscape. This includes areas such as national wilderness areas, wilderness study areas, the wild section of a national wild and scenic river, and other congressionally and administratively designated areas where decision have been made to preserve a natural landscape. Class II, III, and IV as assigned based on a combination of scenic quality, sensitivity level, and distance zones. Generally, the lower the class number, the more sensitive the area is to visual intrusions. These classes do not establish management direction.

Visual Resource Management Class Assignments

Visual Resource Management Classes are assigned through the land use planning process and identify the objectives for managing visual resources. During the preparation of the MFP, all lands in the planning area and the associated Visual Resource Inventory classes were reviewed and assigned to VRM classes. These VRM class assignments considered the value of the visual quality and anticipated future land uses and defined the maximum amount of landscape alteration and surface disturbance that could occur.

Table 12 describes the VRM classes and associated management objectives.

Condition and Trend

In the Dillon planning area, Class I areas are associated with wilderness (the Bear Trap Unit of the Lee Metcalf Wilderness in Madison County) and WSAs scattered across the planning area. Class II areas are often found adjacent to Wilderness Study Area boundaries, and in the planning area are mostly located on the south side of the Centennial Valley, in the Big Sheep Creek area, adjacent to the Blacktail WSA, on the west side of the Ruby Mountains WSA, and along the Madison River corridor and foothills. Public lands on the fringes of the Tobacco Root Mountains, between the Gravelly and Ruby mountains, and in the Medicine Lodge, Clark Canyon and south and east Pioneers areas are in Class III. Over half of the planning area is in Class IV, including the large expanses of public lands in Horse Prairie, Bannack, the Sage Creek and Sweetwater Hills, the north side of the Centennial Valley, and lands in the vicinity of Virginia City Hill.

Table 13 shows the acreage of the planning area currently within each VRM class.

The planning area still maintains much of the scenic quality and pristine viewsheds encountered during the visual resource inventory of the 1970s. While growth in the planning area has occurred and resource extraction has continued over the past 25 years, dramatic alterations of the landscape area-wide have not occurred. Changes in scenic quality in this area are subtle compared to those resulting from dramatic growth in areas like the Bitterroot Valley of Montana and commodity extraction such as open pit mining. The prevalence of grazing in the planning area and the open spaces afforded by an agricultural economy have prevented major change to date. However, the trend in rural development and subdivision, especially in areas in close proximity to public lands, may bode for more rapid change in the future. One particular issue to be considered in this new RMP planning includes the management of public lands in the planning area within the viewshed of the Lewis and Clark National Historic Trail, especially with the bicentennial celebration of Lewis and Clark's journey between 2003 and 2006.

3.1.15 WATER

Table 12. Visual Resource Management Class Objectives

Class I	Preservation of the landscape is the primary management goal in Class I areas. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II	The objective of this class is to retain the existing character of the landscape. Activities or modifications of the environment should not be evident or attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.
Class III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes caused by management activities may be evident but should not detract from the existing landscape.
Class IV	Class IV VRM objective is to provide for management activities which require major modification of the existing character of the landscape. Changes may attract attention and be dominant landscape features but should reflect the basic elements of the existing landscape. Class IV rating is generally reserved for areas where the visual intrusions dominate the viewshed but are in character with the landscape (areas such as rural communities, multiple subdivisions, mining developments, etc.).

Table 13. Acreages of Planning Area by Assigned VRM Classes

VRM Class	Acreage	% Of Planning Area
I	130,924	13.6
II	63,221	6.5
III	223,787	23.3
IV	543,311	56.5

Laws, Regulations, and Policies

Public lands containing water resources are administered by the BLM in accordance with the following laws, mandates, and guidance:

- Clean Water Act of 1987, as amended, 33 USC 1251, 1977
- Control of Pollution from Federal Facilities, 33 USC 1323, 1970
- Public Rangeland Improvement Act, 43 USC 1901-1908, 1978
- Montana Water Use Title Act, Title 85, Chapter 2, Montana Code Annotated of 1973
- Withdrawal Order, April 17, 1926, Public Water Reserve 107 (Springs and Water Holes)
- Executive Order 12088, Federal Compliance with Applicable Pollution Control Standards, Coordination with the Environmental Protection Agency, State, interstate, and local agencies.
- 43 CFR 4120.3-9 (Range Improvements and Water Rights)
- 43 CFR 4100 Bureau of Land Management Grazing Administration

- Annotated Rules of Montana 17.30 Environmental Quality, Water Quality

- Rivers and Harbors Act, 33 USC 403 10, 1899
- Safe Drinking Water Act of 1996, as amended, 42 USC s/s 300f et seq. 1974
- Water Resources Planning Act, 42 USC 1962
- Montana Natural Streambed and Land Preservation Act (310 Law), Title 75, Chapter 2, Montana Code Annotated of 1975
- Montana Streamside Management, Title 77-5-301 Montana Code Annotated (MCA)
- Montana Water Quality Act, 75-5-301 Montana Code Annotated
- BLM Butte District, Standards for Rangeland Health and Guidelines for Livestock Grazing Management, 1997
- BLM Manual Section 7240, Water Quality (USDI 1978)
- BLM Manual Section 7250, Water Rights (USDI 1984)
- Clean Water Action Plan, 1998
- Federal Reserved Water Rights Compact between State of Montana and Bureau of Land Management for the Upper Missouri National Wild and Scenic River and Beartrap Canyon Public Recreation Area. (MCA 85-20-501)
- Memorandum of Understanding with Montana DEQ regarding Water Quality, 2002
- Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management, 2000
- Water Rights Order, Montana Supreme Court, 1979

Affected Environment

The Dillon planning area is located in the Upper Missouri River basin of the Missouri River hydrologic region. Subbasins in the planning area defined by the USGS 4th Hydrologic Unit Code include the Beaverhead, Big Hole, Jefferson, Madison, Red Rock and Ruby, all drained by major rivers of the same name.

Surface Water

The Dillon planning area contains an estimated 914 miles of streams and several small natural lakes in the Axolotl Lakes area. Precipitation in the form of rain and snow are the main sources of surface water and ranges from less than 8 inches in the valleys to over 50 inches in the mountains. Peak flows within the streams in the planning area typically occur between April 15 and July 15 as a result of snowmelt.

Average annual discharge estimates from the principal subbasins in the planning area are displayed in **Table 14.**

Five major reservoirs are located within the planning area as noted on **Table 15**.

Surface water located on and across public lands is mainly used for water-based recreation activities, domestic and agricultural water supplies and maintenance of fisheries and habitats. More detailed surface water availability statistics are available on the USGS website at http://mt.waterdata.usgs.gov/nwis

Groundwater

The occurrence and distribution of ground water in the Dillon planning area is determined by area geology. Primary sources of ground water include infiltration of runoff, stream channel losses and water contained in bedrock formations. Wells for domestic, livestock, irrigation and public purposes are the main use of groundwater in the planning area. In Beaverhead County, well depths vary from 6 to 880 feet, with nearly 70% of wells less than 100 feet in depth and over 90% of wells less than 200 feet in depth. In Madison County well depths vary from 2 to 1222 feet, with over 60% of wells less than 100 feet in depth and just over 80% less than 200 feet in depth. Well development for domestic purposes, as defined in MCA 85-2-306 (less than 35 gallons per minute to 10 acre feet per year), can occur prior

Table 14. Annual Discharge Estimates from Subbasins in the Planning Area

Rivers	Gauge Location	Drainage Area	Mean Annual Yield
Beaverhead River	Twin Bridges	3,600 square miles	305,700 acre feet year
Big Hole	Melrose	2,500 square miles	809,800 acre feet year
Horse Prairie Creek	Grant	325 square miles	61,200 acre feet year
Jefferson River	Three Forks	9,500 square miles	1,487,300 acre feet year
Madison River	Below Ennis Lake	2,200 square miles	1,291,000 acre feet year
Red Rock	Monida	570 square miles	93,500 acre feet year

Table 15. Capacity and Purpose of Reservoirs in the Planning Area

Name of Reservoir	Primary Purpose	Storage Capacity
Lima Reservoir	Irrigation	84,000 acre-feet
Clark Canyon Reservoir	Irrigation	261,000 acre-feet
Ruby Reservoir	Irrigation	38,000 acre-feet
Meadow Lake (Ennis Lake)	Hydropower	39,000 acre-feet
Hebgen Lake	Hydropower	379,000 acre-feet

to filing with the Montana Department of Natural Resources and Conservation and are exempted from the various basin closures.

Public Water Supplies

The DFO is the operator of five public water supplies located at campgrounds on public land in Madison County. Public water suppliers throughout Beaverhead and Madison County also depend upon surface and groundwater supplies that originate on or are influenced by public lands. Amendments to the Safe Drinking Water Act require public water suppliers to perform Source Water Assessments. These assessments are used to determine the susceptibility of public water systems to potential contamination sources.

Information obtained through the assessments is utilized in the development of Source Water Protection Management Plans. The DFO performs assessments and develops management plans for public water supplies operated by the BLM, and provides assistance upon request to communities and public water suppliers whose source waters include public land. In the planning area, most communities rely on groundwater supplies for their water, though Lima and Virginia City obtain water from surface supplies. Activities on BLM have little influence on the groundwater supplies, and in general, few public lands lie near these sources. While there are few public lands administered by BLM in the vicinity of the Lima source located on State lands, the DFO manages several sections of public land in proximity to the private land spring source providing Virginia City's water.

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Montana Water Law

Water in Montana is the property of the State of Montana. The Montana State Constitution states in Article IX, Section 3(3) that "(a)ll surface, underground, flood, and atmospheric waters within the boundaries of the state are the property of the state for the use of its people".

Montana, historically, has recognized riparian and prior appropriation water rights, however, recognition of riparian rights has been very limited and couched in terms of prior appropriation language. Water rights laws were extensively debated during the 1972 Montana Constitutional Convention. The convention incorporated all past water rights into the new Montana Constitution (Article IX, Section 3 (1)) and charged the legislature with providing administration, control, regulation, and a system of centralized record keeping. The resulting legislation, the Montana Water Use Act (Title 85, Chapter 2, Montana Code Annotated) was passed in 1973. The legislation became effective July 1, 1973 and required several significant changes as follows:

- All existing water rights must be adjudicated. Water rights must be quantified and prioritized.
- A permit process was established for changes to existing water rights and establishment of new rights.
- All water rights must be filed with the State of Montana and the State must maintain a centralized records system.
- A water reservation system was created to reserve unappropriated waters to meet Montana's future demands. Unappropriated water was to be reserved by local government entities, state or federal agencies. Reservations applications in the Missouri River basin were submitted by the BLM, the Bureau of Reclamation (BOR), several municipalities, numerous state conservation districts, Montana Department of Health and Environmental Sciences, and Montana FWP. Uses included future irrigation needs, future municipal and industrial growth, water quality maintenance and improvement, and instream flows for fisheries and habitat maintenance.

As a result of the reservation process, BLM filed for rights on 31 streams in the planning area. In addition to these rights, BLM entered into a negotiated compact agreement with the State of Montana for water flows in the Bear Trap Canyon area of the Madison River. The compact agreement was signed by the Director of the Department of Interior in 1997. In 1998 the compact was ratified by the Montana Legislature and signed by the Govenor.

River Basin Closures and Groundwater Aquifer Control Areas

The State of Montana has the authority to control or close river basins and groundwater aquifers to certain types of water appropriations because of water availability problems, water contamination problems, and protection of existing water rights. Where surface water is over appropriated or contaminated, the State of Montana, through the DNRC, can close a basin to further appropriation

The planning area is affected by the legislative closure process. The Upper Missouri River Basin is closed to new appropriations and applications for state water reservations.

Where groundwater is over appropriated or contaminated, the State of Montana can also designate a Controlled Groundwater Area. Currently, there are no Controlled Groundwater Areas in Beaverhead or Madison Counties.

Impaired Streams, TMDLS, and Water Quality Restoration Plans

Section 303(d) of the federal Clean Water Act (and related regulations) requires states to assess the condition of their waters to determine where water quality is impaired (does not fully meet standards) or threatened (is likely to violate standards in the near future). Every two years, the Montana Department of Environmental Quality (DEQ) submits to the Environmental Protection Agency (EPA) a list of water bodies that fail to meet water quality standards—known as the "303(d) list". In Montana, lists have been submitted to the EPA in 1996, 1998, 2000, and most recently, in 2002.

DEQ is required to develop Total Maximum Daily Loads (TMDLs) for all water bodies on the 303(d) list. Montana's approach is to include TMDLs as one component of a comprehensive water quality restoration plan (WQRP) using a watershed approach. In 2000, a federal judicial order required DEQ to complete all necessary TMDLs for all waters on the 1996 303(d) list by 2007. As a result, DEQ has divided the state into 91 watershed planning areas. Eleven (11) of these watershed planning areas span the planning area. **Table 16** lists these areas with the scheduled date for completion.

3.1.16 WILD HORSES AND BURROS

Laws , Regulations, and Policies

The BLM manages the public lands in accordance with laws established by the U.S. Congress. The major legislation and regulations directing management of Wild Free-Roaming Horsess and Burros are the following:

- Wild Free-Roaming Horses and Burros Act of 1971 (16 U.S.C. 1331)
- Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701)
- The Public Rangeland Improvement Act of 1978 (43 U.S.C. 1901 et seq.)

Affected Environment

The DFO had a small wild horse herd at the time of the Mountain Foothills EIS. The Mountain Foothills EIS included a decision to remove these animals, which was completed. The only wild horse and burro work the DRO does is compliance and health inspections for adopted animals.

3.1.17 WILDLIFE

Laws , Regulations, and Policies

Wildlife habitat management on public lands administered by the BLM is directed by the following laws, mandates, and other guidance:

- Federal Land Policy and Management Act of 1976
- National Environmental Policy Act of 1969
- Fish and Wildlife Coordination act of 1958
- Water Quality Act of 1987, as amended from the Federal Water Pollution control Act of 1977
- Public Rangelands Improvements Act of 1978
- Sikes Act of 1974
- Bald Eagle Protection Act of 1940
- Eagle Protection Act of 1962
- Endangered Species Act of 1973
- Migratory Bird Conservation Act of 1929
- Taylor Grazing Act of 1934
- Emergency Wetland Resources Act of 1986
- Fish And Wildlife Conservation Act of 1980
- Streamside Management Zone Law
- Montana Stream Protection Act
- Executive Order 11514, Protection and Enhancement of Environmental Quality
- Executive Order 11988, Floodplain Management
- Executive Order 11990, Protection of Wetlands
- Executive Order 11987, Exotic Organisms
- Executive Order 11989, Off-RoadVvehicles
- Executive Order 13186, Migratory Birds
- Interior Department Manual 520 – riparian habitat
- BLM Manual 1737 – riparian habitatBLM Manual 6500 - wildlife, fish and plant resources
- BLM Manual 6840 – special status species

- M 98-140 Revised Guidelines for Management of Domestic Sheep and Goats In Native Wild Sheep Habitats

Table 16. Watershed planning areas within the DFO

Watershed Planning Area	Schedule Date for Completion
Ruby	2003
Upper Red Rock	2005
Lower Red Rock	2007
Middle Madison	2005
Lower Madison	2007
Beaverhead	2006
North Big Hole	2004
Upper Big Hole	2004
Lower Big Hole	2006
Upper Jefferson	2005
Lower Jefferson	2005

- Fish and Wildlife 2000 - National and state policies
- Memorandum of Understanding July 2000 – WAFWA, USFWS, BLM, and USFS—sage grouse conservation
- Memorandum of Understanding December 1990 - Defenders of Wildlife, Izaak Walton League, National Audubon Society, National Wildlife Federation and BLM—Watchable Wildlife Program
- Memorandum of Understanding October 1977 - Coordination with Montana FWP
- Memorandum of Understanding October 1971 - Coordination with Montana FWP

Affected Environment

The DFO is responsible for the management of a wide variety of wildlife habitat in southwestern Montana. The BLM manages wildlife habitat and FWP manages wildlife populations. These habitats reflect the influence of a variety of past and ongoing human activities and disturbances, resulting in significant increases in some species populations, declines in others, and the modification of large blocks of habitat. These habitats and the wildlife species that rely on them rarely exist solely on BLM lands, and often extend across administrative boundaries to other federal, state, and private lands.

The public lands in the planning area provide mostly mountain foothill habitats that are bounded by National Forest, ARS, and State lands at higher elevations and private lands at lower elevations in the major river valleys. Public land ownership is scattered with intermingled private and state lands although relatively large blocks of public land habitat are present in some areas. In general, this habitat can be segregated into three types: sagebrush shrublands, conifer forest, and riparian/wetland. These habitat types will serve as a basis, to the extent practical, for describing existing conditions, and for developing and comparing management alternatives throughout the planning effort. This will focus on a broader-scale approach as opposed to single species management, although certain individual wildlife species will still be emphasized.

Sagebrush Shrublands

Big sagebrush habitat types are the dominant vegetation communities on the majority of public lands in the planning area. This area supports a significant diversity of sagebrush species and communities, and sagebrush-dependent wildlife species. At mid to lower elevations, Wyoming big sagebrush is the dominant habitat type that provides important winter habitat for mobile wildlife species such as mule deer, pronghorn antelope, and sage grouse,

and localized yearlong habitat by sagebrush-obligate species such as pygmy rabbit. Intermingled occurrences of Basin big sagebrush, mountain big sagebrush, tall three-tip sagebrush, and several low sages add to the diversity of vegetation and habitat structure. At higher elevations, moist mountain big sagebrush communities provide elk calving and sage grouse brood-rearing habitat along with dispersed spring, summer and fall habitat for numerous other species, often in association with forested habitat. Mixed sagebrush communities and localized dominance by other sagebrush species on specific sites within the broader sagebrush types often support uniquely dependent wildlife uses, such as pygmy rabbits.

Sagebrush habitats have been manipulated throughout the DFO, primarily to increase forage production for livestock. Diverse habitat conditions are present and are widely interspersed across various ownerships. Aerial spraying in the 1960's and early 1970's reduced sagebrush canopy on large areas of public land. Many of these areas, especially in Horse Prairie, were subsequently reseeded (an estimated 12,315 acres) to non-native herbaceous species that further altered natural communities. Sagebrush canopy has recovered in many of these locations, but it is uncertain if plant species compositions are representative of historic communities. Prescribed fire and wildland fire that have occurred across all ownerships since the mid-1970's to control sagebrush has had similar effects in reducing canopies, with variable levels of subsequent recovery. Some big sagebrush communities have been converted to tall three-tip sagebrush where extensive burning has occurred In comparison to places outside the planning area (eastern Montana, southeast Idaho, Nevada) few large, extensive stands of sagebrush are present due to natural variation from topography and soils. Roads, rangeland improvement projects, and ongoing sagebrush treatments on other ownerships further fragments this habitat. While satellite imagery shows a slight increase in sagebrush since the late 1970's sagebrush communities that have not been treated or modified are uncommon when considering all ownerships in the planning area and represent reference sites for site potential where they do occur. Due to the regional losses of sagebrush communities, and the dependent wildlife uses, maintenance and improvement of existing sagebrush habitat is important.

Conifer Forest Habitat

Public land forested habitats in the planning area are on the lower edge of extensive timber areas extending onto Beaverhead-Deerlodge National Forest lands, or are discontinuous islands of habitat found on isolated mountain ranges. This forested habitat represents security habitat for big game species and important linkage corridors for wildlife movement between other seasonal habitats. The close association of much of this forested habitat with adjoining sagebrush and riparian habitats supports a broader array of wildlife species than would occur in larger continuous blocks of forest.

Higher elevation lodgepole/spruce/subalpine fir forest provides summer habitat for mule deer and elk, and yearlong habitat for moose and mountain goat. Most wildlife species utilizing this habitat are seasonally migratory or have adapted to cope with significant winter snowfall accumulations. The most extensive areas of this habitat type are in the Centennial Mountains and Blacktail Ridge where public lands extend above 8,000 feet in elevation. Forest carnivores such as wolverine and lynx are highly dependent on this habitat (see Special Status Species—Wildlife section).

Mid-elevation forests dominated by Douglas-fir provide a wider array of habitat that is generally drier and more available throughout the year. These forested areas often provide important security and thermal cover adjacent to big game winter ranges. The dry Douglas-fir habitat type has expanded in recent history, enlarging existing stands, and pioneering into adjacent sagebrush habitats. The lack of recent fire in much of this habitat has created conditions that support wildlife species dependent on later-seral conditions. Enlargement of timber stands has created improved "linkages' between larger forested blocks of habitat. The "encroachment"

along the perimeter and within many of these Douglas-fir stands provides a dense, multi-storied security habitat between open sagebrush and tall conifer forest that may be more available now than historically. This allows wildlife species needing denser forest habitat to also expand their distribution. This habitat supports wildlife uses that may not normally occur in close proximity, such as snowshoe hare adjacent to white-tailed jackrabbit. Although the resulting habitat conversion from sagebrush to forest has reduced forage availability on a localized basis, this effect has been minimal on public lands. Isolated Douglas-fir stands surrounded by sagebrush habitats provide important habitat islands that increase biological diversity in a specific area, and provide security for migrating wildlife species. On a regional scale, these "islands" are part of linkages for mobile species between seasonal habitats, and ecosystems (Yellowstone and central Idaho).

Low elevation forest/woodland dominated by juniper and limber pine is more widely dispersed and often represents expansion into sagebrush and riparian habitats. This habitat is most available in the Sweetwater Hills and along the southern fringe of the Tobacco Roots Mountains. Although juniper can ultimately outcompete sagebrush and grasses thereby reducing forage availability, it also provides structural diversity that is normally lacking in shrubland habitats.

Riparian/Wetland Habitat

Stream riparian habitats in the planning area are generally dominated by willow or aspen communities along foothills streams, and often represent stringers of habitat extending below forested areas into sagebrush/grassland habitat. This habitat occurs between higher elevation habitats on National Forest lands and lower elevation private lands in the major river bottoms. Habitats occur on wetlands and streams throughout the area at elevations from approximately 4500 feet to alpine areas over 9,000 feet. Riparian communities vary significantly from small, sedge dominated wetlands to linear, willow-dominated stream corridors to spruce bogs and alpine wet meadows. Aspen communities are scattered and associated with streams and springs. Riparian vegetation communities found in Montana are described in Hansen, et al. (1995) and Cooper, et al. (1995, 1999). Riparian and wetland communities around springs, seeps and pothole ponds in sagebrush habitats represent important small islands of habitat diversity as well as crucial water sources. Riparian habitats receive a disproportionate amount of wildlife use with approximately 75% of all wildlife species utilizing riparian habitat for at least some portion of their annual life cycle (EPA 1990).

Currently 18% of riparian habitats are in proper functioning condition (see Vegetation—Riparian and Wetlands section). Wildlife habitat values are degraded on riparian areas with functional-at-risk and nonfunctional conditions due to reduced vertical structure, lack of residual herbaceous cover and unstable streambanks.

Relatively few extensive wetland areas or large river floodplain habitats occur on public land. The most extensive wetland habitat in the planning area is located in the lower Centennial Valley, Big Sheep Creek Basin, and the Axolotl Lakes area. Wetlands at Axolotl Lake are generally in proper functioning condition while the productivity and diversity of wetlands in the Centennial Valley and Big Sheep Basin are currently below potential. Custodial management on isolated wetland habitats is perpetuating less than desirable conditions. Lack of water and residual vegetation are primary factors inhibiting productivity for Centennial wetlands.

Habitats of Concern

Long-term fire suppression has influenced habitat structure and composition, particularly in forested habitats. However in the absence of fire, other natural disturbances such as drought and insect infestation/disease, and land use practices such as mining, grazing, logging, prescribed fire, and herbicide spraying have altered plant community structure and composition. Few climax sagebrush and

grassland communities are available in the planning area. These areas may represent relict plant communities at or near site potential for species composition and canopy. Where they do occur, these sites may harbor many unique or sensitive species of plants and animals.

Currently rangeland health regulations require management to achieve proper functioning conditions, as a minimum. In general, increasing potential would result from managing vegetation communities and habitats for a desired future condition (DFC) nearer to site potential (potential natural community - PNC) rather than simply meeting proper functioning condition (PFC) criteria. More habitats would be in late-seral condition supporting species with narrower tolerances to disturbance and habitat suitability. Potential for recovery or reintroduction of species such as bighorn sheep, beaver, trumpeter swan, and sage grouse would increase.

Habitats of concern identified in the Pioneer Mountains and Gravelly Mountain Landscape analyses are low-stature sagebrush communities, curlleaf mountain mahogany, and aspen stands.

Sagebrush habitats on private lands in many areas have been converted to agricultural lands, or are being managed in a fashion that may not provide for many sagebrush-dependent wildlife needs. This emphasizes the importance of maintaining the integrity of sagebrush habitats to provide taller, denser stands on public lands, particularly for mule deer, antelope, and sage grouse winter use, and sage grouse breeding use. Big Sheep Creek Basin and Sagebrush Creek are two examples of these diverse sagebrush communities and their dependent wildlife.

One of the highest concentrations of breeding ferruginous hawks in North America occurs along with nine other species of nesting raptors in two key raptor management areas, extending between Lima, Lima Reservoir, and the lower Sweetwater Hills. Maintenance of existing sagebrush steppe and mountain mahogany habitat types and controlling disturbance of nest sites is important to sustain this use (Atkinson 1992, Atkinson, personal communication 2002, Myers 1987b, Olendorf 1989).

Bighorn sheep occur in three primary habitat areas in the planning area – Tendoy Mountains, Melrose/Maiden Rock, and the upper Madison Valley, although the latter includes relatively little BLM land. The Tendoy bighorns were reintroduced in the mid-1980's and the Melrose/Maiden Rock herd in the mid-1960's. Both herds have sustained major die-offs and have not recovered to previous population levels. Both herds support significant public values through both hunting and wildlife viewing. Maintaining suitable habitat conditions for bighorn sheep, and controlling disturbance and competing uses, in both these habitat areas is important. Although the Hidden Pasture Bighorn Habitat Mangement Plan (HMP) has been partially implemented for the Tendoy herd, no such planning direction is in place for the Melrose/Maiden Rock herd.

Wetland habitat in the lower Centennial Valley between Red Rock Lakes NWR and Lima Dam provides important breeding habitat for trumpeter swan, various waterfowl and numerous wetland-dependent species including two listed and 10 BLM sensitive species. Wetland habitat conditions are less than desirable due to water level fluctuations, irrigation diversion, and livestock grazing practices. The Red Rock Waterfowl HMP provides management objectives and projects for waterfowl, antelope, sage grouse, nongame, and TES species on this wetland habitat across several grazing and unleased allotments. HMP objectives for residual cover and utilization are not being met because they are not part of most existing grazing allotment plans, where they exist.

Blue Lake in the Axolotl Lakes area southeast of Virginia City supports perhaps the only population of axolotl in Montana, an aquatic form of tiger salamander that matures without shedding gills. Laboratory tests indicate that water temperatures over about 71F cause axolotls to metamorphose into normal terrestrial salamanders. Axolotl larvae are extremely vulnerable to fish predation. Maintaining the

cold, relatively sterile environment in Blue Lake, without fish, is essential to maintaining this biologically unique wildlife population (Rauscher 2000).

Several habitat management plans (HMPs) have been in place for a number of years that contain habitat objectives and projects that address various habitat and wildlife species needs.

- BLACKTAIL HMP - 1976, objectives to optimize forage availability for wintering and calving elk on lands adjoining Blacktail Game Range and Robb-Ledford Game Range, maintain security cover, protect stream channels and aquatic habitat, and control human disturbance.
- RED ROCK WATERFOWL HMP - 1983, objectives and projects for waterfowl, antelope, sage grouse, nongame and TES species habitat in the Centennial Valley between Red Rock Lakes NWR and Lima Dam.
- HIDDEN PASTURE BIGHORN HMP - 1980, objectives and projects to support the reintroduction and maintenance of bighorn sheep in the Dixon Mountain/Hidden Pasture core area.
- SHEEP CREEK AQUATIC HMP - 1981, objectives and projects for riparian and aquatic habitat improvement in the Big Sheep Creek watershed.
- WALL CREEK ALLOTMENT HMP - 1983, establishes an allotment grazing plan with objectives for riparian habitat, streambank trout cover, breeding bird pair density, upland condition improvement.
- AXOLOTL LAKES HMP - 1976, management plan for protection of axolotls in Blue Lake, and ecological values in the Axolotl Lakes area. Acquisition of private land habitat adjacent to this area in 2002 enhances values and management opportunities.

Management Concerns

Habitat requirements cannot be met everywhere for all species. Management focus on habitat condition and composition will have a more widespread effect on wildlife species than a focus on individual species. Habitat manipulation will enhance conditions for some species while limiting opportunities for others. Generally, disturbances may promote use by species that are more mobile or those that are more adaptable, and may be detrimental to those with more rigid habitat requirements. Habitat may be only seasonally available due to elevation, aspect, and proximity to disturbances. Seasonal habitat size and availability limits big game population size and distribution. Wildlife social tolerances limit intermingling of species on the same habitat (deer, elk, antelope) and how much human disturbance is tolerated. Learned or traditional behavior limits a species' ability to shift traditional uses to new areas if disturbances make traditional habitats unavailable (leks, calving areas, winter ranges). Some species, such as bighorn sheep, do not readily colonize new habitats. Identifying minimum thresholds for habitat disturbance is most important for small, isolated populations, and sedentary species with very narrow rigid habitat requirements (amphibian/reptiles, small mammals).

Wildlife Species Occurrence

The diversity of wildlife species in southwest Montana is exceptional, and with new rangeland health direction to consider biodiversity and viability of native species, lesser-known nongame species may receive more attention. Numerous high-priority threatened, endangered or sensitive species are present ranging from grizzly bear and bald eagle to pygmy rabbits, loggerhead shrike and Townsend's big-eared bat (see Special Status Species—Wildlife section). Public land acres for seasonal wildlife ranges are displayed in **Table 17.**

Big Game

BLM, FS, and Montana FWP jointly derived seasonal distribution and population estimates for big game species in the late 1980's and early

1990's. This information was used in the 1990's to develop State management plans for elk and mule deer with habitat and population objectives by herd units. These herd units are large, landscape-level areas (Pioneer Mountains, Gravelly Mountains, Lima-Tendoy) that encompass seasonal habitats and movements for discrete populations. However at that scale, it is difficult to derive specific elk or mule deer numbers for a smaller area that may be useful for site specific planning. Seasonal habitats are mapped in GIS, and represent an outside perimeter where a particular seasonal use could be expected to occur by a particular species, but are not intended to be precise because distribution varies annually due to weather, forage availability, and population size and distribution. Areas are included that do not provide for a particular use due to topography, different vegetation, or disturbances but are too small to map at the broad scale, e.g. north slopes on winter ranges, timber patches in sagebrush. Some habitat areas are not designated due to lack of public (BLM) ownership (Big Hole valley, Madison valley). All seasonal habitats for all species have not been identified. Summer and fall habitats are generally not identified since use during those seasons is widely dispersed across many different ownerships. BLM emphasis has been to identify winter habitats, and breeding habitats where they occur on BLM lands.

Table 17. Seasonal Habitat for Game Species in the Dillon Field Office

Public land acreages* include habitats that normally receive some use during a particular season. Acreages are not cumulative since seasonal uses often overlap

Species	Yearlong	Summer/Fall	Winter/Spring
Antelope	123,500	375,000	110,000
Bighorn Sheep	33,000		
Elk	35,000	378,000	305,000
Moose	260,000		32,000
Mountain goat	5,400		
Mule Deer	115,000	365,000	259,000
Sage grouse	647,000**		75,400
Waterfowl	9,000		

* Mountain Foothills Grazing EIS (USDI-BLM 1980); Montana FWP 2002 GIS; BLM 2001 GIS

** Montana FWP "occupied habitat"

Elk, Mule Deer, Antelope

The planning area provides habitat for nearly all the game species recognized in Montana. Elk, mule deer and antelope are widespread and fairly common. Elk numbers have expanded until recently and were generally above Montana FWP Elk Plan population objectives in many herd units. Populations have been reduced, and most units have now stabilized within plan objectives. Mule deer populations have declined and rebounded at least twice since the late 1970's. Current populations appear to be increasing. Antelope numbers have remained generally static during the 1980's and 1990's although current numbers are somewhat lower than average in some areas. These three big game species travel widely throughout the area between seasonal habitats, with major winter habitat occurring on public and private lands. Montana FWP winter game ranges at Wall Creek, Robb Ledford and the East Fork of Blacktail Creek sustain significant numbers of wintering elk, mule deer and to a lesser degree antelope. General migration corridors for these species are fairly well identified. Extensive interchange between elk and mule deer populations in Montana and Idaho occurs across the Continental Divide, with animals using winter habitat in Montana and summer habitat in Idaho, and the reverse.

Habitat condition is generally not a limiting factor for mule deer or elk populations. Forage availability is sufficient on most elk winter habitats although as numbers continue to increase, competition with livestock on the same areas will become more pronounced. Utilization studies on major winter habitats in Dyce Creek, E.F. Blacktail Creek, Price Creek, Ramshorn Creek, E.F. Blacktail Creek, Barton Gulch and Camp Creek show relatively little competition for forage between elk and cattle. Populations in most elk herd units are at or above Montana FWP Elk Plan objectives. Big sagebrush canopy and condition is sufficient to provide forage and cover on mule deer and antelope winter habitats area-wide, although localized areas (Sweetwater Basin, Centennial Valley) are not meeting the seasonal needs of these species as a result of past sagebrush burning on all ownerships, competing livestock use, or habitat fragmentation. Mule deer have been displaced from some sagebrush winter range where elk have taken advantage of increased herbaceous forage availability resulting from prescribed fire. Big game security in forested areas is considered in all forestry projects. Relatively small timber stands that are surrounded by or adjacent to open habitats with high open road densities inherently cannot meet most recognized big game security cover standards. However, the availability of dense cover in many Douglas-fir habitats (encroachment) is currently sufficient to provide some degree of effective hiding cover during hunting seasons.

Pronghorn antelope distribution has changed relatively little since the early 1980's, but numbers have fluctuated substantially. Habitat suitability is adequate to provide seasonal antelope needs in most areas, although localized areas with reduced sagebrush canopy and composition limit antelope use, particularly for winter habitat (Big Sheep Creek Basin, Sweetwater Basin). Barrier fences that inhibit or prevent free movement to all big game but particularly antelope are a concern area-wide. Fence modification has occurred in some areas but has not addressed all known barrier fences.

White-Tailed Deer

White-tailed deer have increased in the planning area since the late 1970's partially as a result of agricultural development in the major river valleys, and population expansion. Significant numbers occur throughout the Ruby River watershed, below Divide in the Big Hole River corridor, along the Beaverhead River below Clark Canyon dam, and all along the Jefferson River. White-tails have expanded into nearly all surrounding habitat from these areas in varying numbers, with occurrences documented in the upper Centennial Valley on Red Rock Lakes NWR, in Lima Peaks, and Big Sheep Creek Basin, upper Horse Prairie and Blacktail Creek. This expansion has intruded into seasonal and yearlong mule deer habitat, particularly lower elevation winter and spring habitats, and represents direct competition for food and space with mule deer, and in some areas displacing mule deer from previously preferred habitat. The majority of this overlap occurs on private lands and has not been well quantified on public lands.

Moose

Moose have also increased in numbers and distribution since the late 1970's. Moose currently occur at least seasonally and in small numbers in all major river valleys and drainages throughout the planning area wherever dense riparian vegetation is present. Greatest concentrations occur in the Big Hole Valley and Centennial Valley. Most moose habitat is associated with riparian corridors that extend from the major drainages upward in elevation into conifer forests. At higher elevation in moist forest types, moose use expands out of riparian areas and can occur yearlong and area-wide. Mountain mahogany is supporting substantial winter moose use where that habitat type is available adjacent to forested cover. Overall distribution and specific seasonal uses, when identified (mostly winter), are mapped in GIS and described in **Table 17**. Population estimates are not available in all areas.

Bighorn Sheep and Mountain Goat

Bighorn sheep occur on historic habitat in three areas in the DFO - Melrose/Maiden Rock, Tendoy Mountains, and in the Madison Range east of the Madison River (**Table 17**). Bighorns in the Madison are widespread and occur on only a few small tracts of public land adjacent to Forest Service lands. All of these populations have been reestablished after being extirpated in the 1930's, and all suffered die-offs in the 1990's. Periodic supplemental reintroductions have sustained all three populations. When numbers were high, bighorn sheep from the Melrose/Maiden Rock population were transplanted into other historic habitat outside the DFO. Montana FWP is planning to release bighorns into the Greenhorn Mountains in 2003 or 2004. Bighorn sheep are a high priority species that receive significant local, state and national attention and interest. Substantial historic bighorn sheep habitat is present in the planning area but is unavailable due to conflicting domestic sheep grazing. National BLM bighorn sheep guidelines provide direction for managing populations and habitat (USDI-BLM 1998). GIS coverages map the extent of bighorn sheep habitat when populations were high and do not reflect current distribution. Current population numbers are unknown.

Most mountain goat habitat in this area occurs on FS lands but goats do occur on public lands in Beartrap Canyon on the Madison River, around Jeff Davis Peak in Horse Prairie and in the E.F. Blacktail Creek. Isolated use occurs adjacent to the southwest Tobacco Root Mountains, western Highland Mountains, Tendoy Mountains and Lima Peaks. Mountain goat habitat is seldom affected by BLM public land management activities and has not been an issue, although motorized recreation (4-wheelers) is encroaching into mountain goat habitat in some areas.

Upland Game Birds

Mapping of game bird distribution identifies habitat that may be occupied by game birds some time during the year, or in the case of gray partridge, is based on limited observations. Identification of specific seasonal habitats is incomplete, and for blue grouse is based primarily on the presence of suitable habitat rather than a presence of bird populations. Radio telemetry work on sage grouse in 1999-2002 has provided information about specific seasonal habitat areas in Horse Prairie, Big Sheep Creek Basin and Sweetwater Basin.

Sage Grouse

Sage grouse populations and sagebrush habitat are issues for public land management due to significant habitat losses range-wide from wildfire and prescribed fire, habitat conversion for agricultural needs, livestock grazing, energy/mineral exploration and development, and expanding human populations. Pending petitions for listing the sage grouse under the Endangered Species Act emphasize the need for region-wide assessments addressing habitat conditions and population stability. Potential large-scale vegetation manipulation, particularly through fuels and fire management, also emphasizes the need to better understand sage grouse ecology. Conservation planning is underway in Montana to potentially minimize the impacts of a potential listing and initiate actions to sustain viable populations of sage grouse. Local conservation planning specifically for southwest Montana has not been implemented.

Long-term sage grouse population declines in southwest Montana have been documented for some time, but habitat quality and composition have not been adequately investigated. Crowley and Connelly (1996) documented declining numbers of male sage grouse on nearly all leks in southwest Montana since the early 1970s, although some numbers have stabilized or increased slightly since then. Substantial sage grouse research information has been collected in southeast Idaho that is pertinent to southwest Montana, including some evidence that migratory sage grouse are moving between southwestern Montana and southeastern Idaho (Connelly, et. al 1988, Connelly, et al. 1991, J.W. Connelly, personal comm.) In 1999, the Dillon Field Office initiated a cooperative study

of sage grouse movements, distribution, and habitat inventory that could serve as the basis for expanded research and habitat conservation. Four years of study located key habitats in Horse Prairie, Big Sheep Basin and the Tendoy Mountains, and in Sweetwater Basin. Sage grouse using given lek complexes appear to act as discrete population units, at least during the breeding season, with little interchange between groups. However, seasonal movements - distance and duration - vary significantly between groups of sage grouse. Large areas of sagebrush appear to provide suitable habitat for sage grouse but are unoccupied. The area centering on Reservoir Creek/Badger Gulch southwest of Bannack appears to be a relatively intact core habitat supporting the largest concentration of sage grouse leks and winter habitat on public lands in the planning area (Roscoe in press). This area is supporting several hundred sage grouse yearlong.

Lek monitoring has occurred sporadically in planning area since the mid-1970's and is used as an index to population size and trend. Montana FWP maintains a database documenting lek occupancy and male attendance. Currently, 40 leks are identified in the planning area, with 35 active in 2002, with at least 22 of these occurring on public land. Important seasonal habitats are centered on breeding and winter complexes (**Table 17**). Brood rearing habitats have not been adequately determined, but are locally confined.

Blue Grouse, Ruffed Grouse, Grey Partridge, Columbian Sharp-tailed Grouse, Turkey

Blue grouse are typically found in Douglas-fir habitat yearlong, focusing on aspen/willow riparian habitats during breeding and brood rearing. Ruffed grouse occur locally in major riparian habitats in the Big Hole Valley and the south Centennial Valley. Grey partridge have expanded their range in the planning area since the early 1970s and are generally found in low to moderate numbers in mixed sagebrush-grasslands at low- to mid-elevations. Small groups of Columbian sharp-tailed grouse have moved into the Centennial Valley and upper Madison River Valley from southeast Idaho since the mid-1990s. Turkeys were released in Timber Canyon on the southwest flank of McCartney Mountain in the mid-1960s but did not establish a stable population. Turkeys are currently found along the Big Hole River downstream from Glen, and north of Dillon along the Beaverhead River. These birds are most likely feral and are not a result of the early release. Turkeys were released on private lands along the Jefferson River east of Whitehall in the late 1990's. These birds could eventually occupy public land habitat around the north end of the Tobacco Root Mountains. All of these species use at least a small amount of public land, but specific seasonal habitats and population numbers have not been determined.

Furbearers

The occurrence of large carnivores has not been quantified for the DFO. Black bear occur area-wide and their distribution most closely follows the occurrence of spring and summer elk habitat. Mountain lion numbers have increased in recent years but increased hunting quotas and hunter interest have apparently controlled this increase. Bobcats are relatively rare. Pine marten utilize suitable lodgepole habitat at dispersed locations. Coyote and red fox are found area-wide and numbers are relatively high, particularly since fur prices are low and private trapping and hunting has essentially ended. Coyote predation on young big game animals, and upland game birds, has become an issue. Control efforts by Wildlife Services, USDA-APHIS using aerial gunning, trapping and M-44s are confined to domestic sheep allotments and adjoining areas. Muskrat and mink are present in small numbers in riparian/wetland areas where sufficient residual vegetation is present to provide forage, cover and sustain a prey base. River otter are present in small numbers on public land, mostly on the lower Madison River and Big Hole River.

Extensive willow and aspen habitats that historically supported beavers have been reduced, and many watersheds are no longer capable of sustaining stable beaver activity. While there are existing populations of beaver,

stable colonies have declined substantially since the 1970's and long-term recolonization is not occurring. This precludes opportunities for riparian restoration that could otherwise be achieved by beaver activity. The loss of this keystone species and the habitat that it creates for numerous other species has reduced biological diversity.

Waterfowl

Twenty-two species of ducks, geese, swans, and mergansers have been documented on public lands in the DFO. Breeding habitat is available on or adjacent to Lima Reservoir, Ruby Reservoir and Clark Canyon Reservoir, along all major rivers, scattered wetlands in the Centennial Valley, and on widely scattered wetlands, streams, and beaver ponds area-wide. Major migratory corridors and winter concentrations occur along the Madison and Beaverhead Rivers. One of the largest molting populations of Canada geese in the northern Rocky Mountains annually occupies Lima Reservoir in the Centennial Valley during summer months. The Centennial Valley provides some of the few public land wetlands in the United States that support trumpeter swans. In association with habitat on Red Rock Lakes NWR, these wetlands support one-third to one-half of the breeding trumpeter swans in the tri-state population in Montana, Idaho and Wyoming. Cooperative waterfowl/wetland enhancement projects are being implemented in the planning area through the Intermountain Joint Venture and Ducks Unlimited, Inc. partnerships.

Protected Non-game Species

Migratory Birds

There are at least 175 species of migratory birds that occur on the planning area during part of the year. These birds are as diverse as the Calliope hummingbird, brown creeper, Brewer's sparrow, red-tailed hawk, mallard and sandhill crane. Most of these birds are summer residents that use habitats ranging from lower elevation wetlands to high elevation forests for breeding and raising young. Some species such as American robin and mallard are migratory but small populations may be present yearlong depending on seasonal conditions. Winter residents such as rough-legged hawk, snow buntings and rosy-crowned gray finches arrive from arctic breeding grounds, or high elevation, alpine areas to utilize winter habitats in lower elevation foothills and major river valleys, seasonally replacing summer residents. Major migration corridors follow the Beaverhead and Madison River valleys, passing literally millions of waterfowl, shorebirds, raptors and songbirds in spring and fall (Harmata et al. 1997).

Raptors–Eagles, Hawks and Owls

Overall, 21 species of raptors (five broad-winged hawks, two eagles, four falcons, three accipiters, seven owls) occur at least seasonally on public lands in DFO. One of the highest concentrations of breeding ferruginous hawks in North America occurs along with nine other species of nesting raptors in two key raptor management areas in the DFO. Monitoring of ferruginous hawk and golden eagle breeding territories since the mid-1980s indicates declines in occupancy and production have occurred while no changes in habitat are apparent. These changes may be related to drought, declines in prey availability, and off-site population impacts (losses on winter habitats).

There is increasing emphasis on protecting and managing habitat for all migratory birds, particularly neotropical songbirds and shorebirds (EO 13186, 2002). Expansion of funding opportunities under the North American Wetlands Conservation Act and other partnership opportunities will support increased management consideration for these species. The Partners in Fight Bird Conservation Plan for Montana was prepared "to focus on restoring healthy ecosystems that will sustain productive and complete bird communities" (Montana Partners in Flight, 2000), and identified 141 species for priority status in five habitat groups. **Table 18** lists fourteen of these species recognized as high priority and in need of immediate conservation actions

Other Non-game Species

Information on small mammals, bats, reptiles and amphibians is lacking. Databases maintained by the Montana Natural Heritage Program document general occurrences and potential for many of these groups of wildlife but site specific inventories have not been conducted for most of the Dillon Field Office. However as inventories are conducted, new occurrences and range extensions are being discovered which emphasizes the need for more comprehensive work. Localized bat inventories are being conducted as part of abandoned mine land rehabilitation projects. A faunal inventory of the Centennial Valley sandhills in 1999 documented new occurrences of Preble's shrew and Great Basin pocket mouse (Hendricks and Roedel 2001).

Table 18. Priority Bird Species from Montana Bird Conservation Plan in Need of Immediate Conservation Actions

Species	BLM Status	Occurrence in DFO	Habitat
Common loon	Sensitive	Transient	Wetland
Trumpeter swan	Sensitive	Resident	Wetland
Harlequin duck	Sensitive	Transient	Wetland
Sage grouse	None	Resident	Sagebrush
Piping Plover	Threatened	N/A	
Mountain plover	Proposed	Resident	Grassland
Interior least tern	Endangered	N/A	
Flammulated owl	Sensitive	Unknown but suitable	Forest
Burrowing owl	Sensitive	Transient	Sage/grassland
Black-backed woodpecker	Sensitive	Resident	Forest
Olive-sided flycatcher	None	N/A	
Brown creeper	None	Resident	Forest
Sprague's pipit	None	N/A	
Baird's sparrow	Sensitive	N/A	

Amphibians and Reptiles

Amphibians have been recognized as important indicators of ecosystem health as many are declining in the western US and worldwide due to a wide variety of influences. Northern leopard frog has disappeared over much of its range in western Montana, including the DFO, and is declining in at least some areas in eastern Montana. Recent boreal toad declines are a concern in some areas, and distribution of this toad, and many other species, in planning area is largely unknown (Roedel and Hendricks 1998). Livestock grazing may be the greatest impact to amphibians and reptiles in this area where riparian and wetland conditions are degraded (Maxell 2000).

Blue Lake in the Axolotl Lakes area southeast of Virginia City supports perhaps the only population of axolotl in Montana, an aquatic form of tiger salamander that matures without shedding gills. Laboratory tests indicate that water temperatures over about 71°F cause axolotls to metamorphose into normal terrestrial salamanders. Axolotl larvae are extremely vulnerable to fish predation. Maintaining the cold, relatively sterile environment in Blue Lake, without fish, is essential to maintaining this biologically unique wildlife population (Rauscher 2000).

The MNHP documents 446 records for seven species of amphibians and 262 records for seven reptile species in the Dillon and Butte Field Offices up to 1998. Inventory by MNHP between 1994 and 1998 revisited locations for historic records of amphibians and reptiles, and other high-probability habitats to determine

presence of various species (Roedel and Hendricks 1998). Species occurrences are listed in **Table 19**. This inventory did not establish area-wide distributions, occurrence or population sizes. The short-horned lizard was the only species with a historical record from the portions of the planning area (Beaverhead

Table 19. Amphibian and Reptile Occurrence in the Planning Area

Species	#MNHP records *	# records 1994-1998	# sites 1996-1998	Preferred Habitat
Long –toed salamander (*Ambystoma macrodactylum*)	31	20	0	Wetlands in low elevation sagebrush to alpine
Tiger salamander (*Ambystoma tigrinum*)	21	3	2	Ponds, lakes, springs, rodent burrows during daytime
Tailed frog (*Ascaphus truei*)	46	28	0	Small, swift , cold mountain streams
Western (Boreal) toad (*Bufo boreas*)	65	37	7	Terrestrial with wide range of elevation, breed in shallow water with mud bottom
Western chorus frog (*Pseudacris triseriata*)	40	37	5	Terrestrial except during breeding, grasslands and open forest
Northern leopard frog (*Rana pipiens*)	21	7	0	Dense vegetation in non-forested habitat
Columbia spotted frog (*Rana luteiventris*)	222	152	32	Water bodies within openings in forest habitat
Painted turtle (*Chrysemys picta*)	14	10	1	Lower elevation ponds, lakes, slow moving streams
Rubber boa (*Charina bottae*)	32	5		Around logs and rocks in moist or dry forest types
Racer (*Coluber constrictor*)	13	3		Open habitat in shortgrass, shrublands or forest
Gopher (Bull) snake (*Pituophis catenifer*)	22	11		Dry arid areas in grassland, shrubland or open pine forest
Western rattlesnake (*Crotalus viridis*)	39	17	2	Open, arid areas, rock outcrops
Common garter snake (*Thamnophis sirtalis*)	21	8		Forest habitats, low elevation wetlands
Western garter snake (*Thamnophis elegans*)	121	75	17	Most habitats but most common around wetlands

*combined records for Dillon and Butte Field Offices

County) that was not relocated between 1994 and 1998. A broad scale inventory of reptiles and amphibians in specific watersheds was conducted in 2002, and provides the most recent and comprehensive determination of species occurrences and distribution in specific watersheds.

Insects

Insect occurrences and distribution are not considered in land management activities. An inventory of fauna in the Centennial Valley sandhills documented the presence of four species of tiger beetles and 14 species of butterflies. All tiger beetles are typical on early seral, unstable sites, and their site-specific distribution displays some unique inter-specific habitat competition. The common presence of *Cicindela formosa* is noteworthy since this location is well beyond the range limit east of the Rocky Mountains. It has not been described in Idaho (Hendricks and Roedel 2001). This inventory emphasizes the likelihood of potential area-wide species occurrences and habitat inter-relationships that have not been described through lack of inventory.

Wildlife Reintroductions

Various wildlife introductions have been made in the planning area since the early 1960s. Most have been implemented by Montana FWP and involved game species, both native and non-native. Bighorn sheep have been reintroduced in the Highlands (Melrose/Maiden Rock), Tendoy Mountains, and the Madison Range. Bighorns will be released in the Greenhorn Mountains as soon as animals are available for transplant. Suitable, historic habitat is available in many other areas that could support future reintroductions.

Non-native game birds occur locally in the DFO, mostly on private lands, through Montana FWP and private releases. Montana FWP and BLM released turkeys on McCartney Mountain in the 1960s but theses birds did not become established. A recent release along the Jefferson River near Whitehall in the late 1990's established turkeys on private lands. A small amount of suitable public land habitat is available in that area. Chukar and ring-necked pheasant have been released in small numbers on private lands primarily in major river bottoms with relatively short-term success, and no effect on public lands.

Proposed reintroductions are coordinated and/or implemented by Montana FWP on a case-by-case basis. Only native species can be reintroduced in BLM wilderness areas and WSAs. Non-native species can be released on other public lands through an approved habitat management plan.