

Appendix A

Issues Considered But Eliminated From Detailed Analysis

The National Environmental Protection Act (NEPA) provides for the identification and elimination from detailed study of issues, which are not significant or which have been covered by prior environmental review, narrowing the discussion of these issues to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere (40 CFR 1501.7 (3)). While these concerns are important, they were either unaffected or mildly affected by the proposed action, or the effects could be adequately mitigated. A number of issues were found not to be significant to the decision and were eliminated from further detailed analysis. In general, the reasons for eliminating these issues included:

- (1) They were not relevant or specific to this proposal for livestock grazing on the Crazy Allotment.
- (2) They were beyond the scope of this project level analysis and decision to be made.
- (3) Experience or analysis from other similar projects on the Gallatin Forest has consistently demonstrated that effects related to this issue are not significant.
- (4) The proposed action was modified to include mitigation, which is effective in alleviating any major impact.

These issues and the reasons for eliminating them from detailed analysis are briefly discussed on the following pages:

A. Soils

Soils on areas of suitable range include Soils Mapping Units 34-1B, 35-1B, 35-1C, 46-2A, 54-5A, 64-2A, and 85-3A (from Soils Survey of the Gallatin Forest Area, 1984). Soils of these types are considered moderately erodible.

There are approximately 1,680 acres of suitable range on the allotment. Soils mapping (1977) classed the soils on these acres as 2% in excellent condition, 81% in good condition, and 17% in fair condition. The original vegetation/soil mapping was done in 1976. Vegetation mapping was field reviewed in 1998 primarily to update and include cover type changes due to timber harvest and conifer encroachment. Soil conditions were reviewed along with vegetation in 1998.

Since 1976, various practices have changed soil conditions in affected areas. Since that time, there have been approximately 450 acres of timber harvest and associated construction of logging roads. Timber harvest has occurred on private land. Larkspur

has been hand-dug on and off for many years. Please refer to the discussion under vegetation above regarding rotovating. This soil disturbing practice occurred on both private and public land.

Specific areas of soil impact and resulting occupation by low seral species include Section 11 (SENE), Section 12 (NW¼), portions of all meadows in the east half of Section 13 (S½), and parts of Section 14.

Some accessible reaches of Middle Fork Big Timber Creek and Devil Creek do not meet Forest Plan standards for soil protection. Please refer to Chapter 2 Fisheries.

Past impacts to soils and the related vegetation changes have been considerable. However, only a small portion of these impacts can be directly attributed to the currently permitted livestock grazing. See Vegetation section on p. 3-2.

Livestock - Soil Erosion and Compaction

Concern was expressed that livestock grazing would accelerate soil erosion and compaction.

Since 1976, various practices have occurred that resulted in altered soil conditions in affected areas. Since 1976 there have been approximately 300 acres of timber harvest and associated road construction on private land. Larkspur has been hand dug in several places for many years. An unknown amount of grassland and shrubland was rotovated in the 1970s and 1980s. Grazing has been ongoing on the allotment since prior to the establishment of the National Forest. Forest Service records begin in 1939. Initially, sheep grazing predominated and early records indicate grazing use was sometimes very high. Cattle have grazed the allotment since 1954 and again records indicate that grazing was excessive at times.

Because of the recurring nature of annual grazing, and the other concurrent activities, it is difficult to identify which management practice is causing which result. Grazing has likely been primarily responsible for the current condition of Devil Creek, although increased runoff from clearcut units on private land may have contributed to instream sediment and bank sloughing. Plant composition on impacted areas on private and public land consists largely of low seral species. This likely resulted from soil disturbance during harvest, rotovating, and many years of annual grazing in the presence of extremely well adapted and aggressive non-native colonizers. A small wetland in Section 14 is being dewatered as natural downcutting of the stream lowers the water table. In this area, the changes are not caused by management practices but rather by natural forces operating over time.

Grazing impacts to soils along some reaches of Devil Creek and the Middle Fork is addressed by Key Issue #1 on Page 3-16 and 17 under both Alternatives 1 and 2.

B. WATER QUALITY

Livestock/Water Quality

The potential for change in water quality associated with livestock grazing is a forest wide issue identified in scoping. Livestock grazing can degrade water quality by introducing fecal material and nutrients in streamside areas, which can leach or flush into streams. The State of Montana has classified all waters within the allotment as B1 (ARM 16.20.604). The associated beneficial uses are drinking; culinary and food processing purposes after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply. Water quality impacts associated with livestock grazing are a result of livestock concentration and disproportionately high use of riparian areas when compared to the adjacent uplands. Impacts to water quality can include increased thermal energy inputs through removal of riparian vegetation, increased stream sedimentation from physical breakdown and destabilization of streambanks, and elevated bacteria numbers derived from manure concentrations along streams. Water quality parameters, which could be affected, include temperature, turbidity, fecal coliform, and sediment.

This issue was dismissed because no areas in the allotment are known or suspected to have a sufficient concentration of livestock along or through streams to result in water quality violations. Water quality standard violations by livestock grazing in Montana are usually associated with feedlots or corrals where livestock are heavily concentrated near streams. These situations do not occur on the allotment. Both Alternatives 1 & 2 would make improvements to water quality, streambank stability, and riparian vegetation.

Laws, Guidance, and Other Policies

The ARM 16.20.603 identifies that "land management activities must not generate pollutants in excess of those that are naturally occurring", regardless of the stream's classification. "Naturally occurring" is defined in the ARM as "the water quality condition resulting from runoff or percolation over which man has no control or from developed lands where all reasonable land, soil, and water conservation practices (BMPs) have been applied". Land management activities that are in compliance with Montana water quality law and regulations have the following three elements.

1. BMPs are applied;
2. Beneficial uses are not impaired; and
3. Monitoring is in place to test whether BMPs are adequate to protect beneficial uses.

The "Watershed Management Guidelines for the Gallatin National Forest" (Glasser, 1987) and Soils and Water Conservation Handbook (FSH 2509.22; 5/88 & 4/95) list the BMPs that will be used on the allotment to protect beneficial uses. Since 1989 the Gallatin National Forest (NF) has had an aggressive allotment BMP monitoring program as part of the implementation of water quality monitoring.

The Montana Water Quality Assessment 305(b) report (Montana Water Quality Division, 1994) lists 11 water quality limited stream segments (WQLS) on the Gallatin NF. All of the WQLS on the Gallatin are listed as fully supporting agricultural uses, and none have moderate or high rangeland pasture land listed as probable sources of impairment. Therefore, none of the streams on the Gallatin NF require contacting the State of Montana WQD to determine the total maximum daily load (TMDL) for livestock grazing in a WQLS.

C. FISHERIES

Livestock/Fisheries - Trampling of Spawning Redds

Recent studies have demonstrated that high mortality of incubating fish eggs in spawning tributaries may be attributed to cattle trampling of spawning redds (Bowersox 1998). Often times the spawning and incubation periods for cutthroat trout coincide with periods of cattle use, so the potential for cattle trampling of redds can be high. If spawning habitat areas are accessible to cattle, then redd trampling can reduce survival of incubation embryos and reproduction success.

The current situation of the allotment regarding the three major tributaries of Big Timber Creek are described as follows:

- 1) South Fork of Big Timber Creek: Cattle access only a very small portion of the stream, so no trampling of spawning redds occurs (*no impact*).
- 2) Middle Fork Big Timber Creek: Brook trout, the only trout species present in the stream, spawn in the fall after cattle are removed from the allotment. Eggs hatch in the spring before cattle are moved back onto the allotment. Thus, the potential for trampling of spawning redds is non-existent, (*no impact*).

- 3) Devil Creek: Brook trout, the only trout species present in the stream, spawn in the fall after cattle are removed from the allotment. Eggs hatch in the early spring before cattle are moved back onto the allotment. Thus, the potential for trampling of spawning redds is non-existent, *(no impact)*.

Because there is no potential for cattle to impact spawning redd with the implementation of Alternatives 1 or 2, this issue has been dismissed and will not be further addressed in this document.

Livestock/Yellowstone Cutthroat Trout - BE Determination and Rationale

The concern was expressed that grazing cattle in the area would negatively affect Yellowstone Cutthroat Trout. Yellowstone Cutthroat Trout (*Onchorynchus clarki bovieri*) are classified by the Regional Forester as a Sensitive Species (FSM 2672.24) and are listed as a Species of Special Concern by the State of Montana (MDFWP 1985). Genetically pure populations of Yellowstone Cutthroat Trout are documented to be present in the South Fork of Big Timber Creek.

It has been determined that direct, indirect, and cumulative effects of cattle and grazing on the Crazy Allotment will not adversely affect Yellowstone cutthroat trout individuals, populations, and/or their habitat within the analysis area. Neither Alternative 1 nor 2 would have adverse effects to Yellowstone cutthroat trout.

Rationale used in making this determination is based on the inherent stability of the stream channel type and pristine conditions in the South Fork Creek within the allotment, the lack of evidence of detrimental effects to riparian vegetation or streambank stability along South Fork Creek (p. 3-9) from past grazing practices based on the observations during onsite reviews conducted at different times of the year, and the extremely low probability of trampling of Yellowstone cutthroat trout redds by cattle.

D. RANGE SUITABILITY

Concern was expressed regarding the suitability of this area for livestock grazing. "Suitable" livestock range is defined as range which is accessible or can be made accessible to livestock, is below 30% slope, produces at least 100 pounds per acres air dry weight of palatable forage, and can be grazed on a sustained yield basis in harmony with other resource uses and values under reasonable management goals.

Range suitability has been mapped several times over the years. Suitability was field reviewed in 1995, 1997, and 1998. At that time, several old timber harvest units and areas of secondary range were removed from the carrying capacity totals because the old harvest units were restocked with trees and the secondary range was receiving

little or no use by cattle. Recent timber cutting units were mapped and evaluated and suitable portions of these units were added to the carrying capacity estimates. Suitability was based on Forest Service suitability standards (FSH 2209.14 R1). The accuracy of that rating was reevaluated during this analysis.

This allotment contains approximately 20% suitable range. There are other non-suitable meadow or timbered grassland areas within the allotment, but these are not suitable for cattle due to dense stands of timber, rock, or cliffs preventing access, distance from water, low productivity, slope, or other reasons.

Suitability of the Crazy Allotment has been determined through mapping according to suitability standards and has been monitored and adjusted. Effects of grazing on other resources have been evaluated as part of the discussion regarding those resources. Please refer to sections on wildlife, soils, vegetation, recreation, etc.

E. ASPEN REGENERATION AND VIGOR

There is a concern that livestock grazing may damage aspen stands by browsing, trampling, or mechanical damage to suckers or saplings.

There has been damage to aspen shoots in areas on the allotment. This plant community represents a small portion of potential wildlife habitat, although it is considered valuable to big game, mountain grouse, and other wildlife species. Some aspen grows on forested land that is surrounded by coniferous forest with little or no forage, features which would make the area unattractive to cattle. Other aspen stands occur in grassland/shrubland riparian habitats.

Congregating cattle are causing minor effects on aspen communities near Devil Creek. Managing for the appropriate level of grazing use in riparian areas, allowing recovery of Devil Creek, and improving livestock distribution on the allotment will reduce impacts associated with grazing in and near aspen communities.

Alternative 2 was developed to help address the impacts of excessive grazing to riparian areas and associated aspen communities in Devil Creek and other riparian and upland areas on the allotment. Alternative 1 would also address this issue by eliminating grazing on the National Forest portions of the allotment.

F. Wildlife

The Crazy Allotment provides habitat for a wide variety of wildlife species. Mule deer, elk, black bears and mountain goats are the principle big game species inhabiting the allotment. Moose and white-tailed deer may be found on the allotment, but in low numbers. Bighorn sheep, bison and pronghorn antelope do not inhabit the allotment or general vicinity.

Small game species, primarily mountain grouse, inhabit the allotment. Ruffed and blue grouse can be found on the allotment. Ruffed grouse habitat is associated with quaking aspen and riparian areas. Blue grouse habitat is associated with coniferous forest and riparian areas.

Furbearing mammals such as the weasel, bobcat, and red fox occur on the allotment. These species are found primarily in forested habitats. Beaver are not found on the allotment.

Nongame species, such as small mammals, resident and neotropical migratory birds inhabit the allotment. Most nongame species common to vegetation types associated with mid and high elevation mountainous habitat can be found on the allotment. Red-backed voles, red squirrels, snowshoe hares, hairy woodpeckers, American robins, and warbling vireos are examples of a few of these species.

Management indicator species (MIS) represent a group of species associated with a general habitat category. There are 6 MIS on the Gallatin, including: grizzly bear, bald eagle, elk, northern goshawk, pine martin and wild trout.

Grizzly bears have not recently been sighted in the allotment or in other portions of the Crazy Mountains. Bald eagles may occasionally be found on the allotment during the winter, but generally do not inhabit the allotment during other seasons. See the BA/BE located in the Project File (Chapter 10-C-1).

Elk inhabit the allotment from spring to fall, but winter on private land along Devil Creek. The allotment does not provide suitable winter range. Northern goshawk and pine martin inhabit dry and wet old-growth Douglas-fir forests, respectively, and may inhabit the allotment. Wild trout are discussed under the fisheries section of this document.

Threatened and endangered species may inhabit the allotment. There are no confirmed sightings of grizzly bears in recent years. Grizzlies inhabited the area prior to European settlement, but have not been recorded in the Crazy Mountains for decades. The Fish and Wildlife Service (FWS) does not require the Forest Service to analyze the effects of livestock grazing on grizzly bears north of Interstate 90. Bald eagles may occur on the allotment during winter months, but not during other times of the year. There are suitable habitat conditions for Canada lynx within the allotment,

however, records do not currently exist for lynx sightings on the east side of the Crazy Mountains. Gray wolves are currently listed by the FWS as "nonessential experimental" populations in the Greater Yellowstone Ecosystem. Currently, there are no records of gray wolves utilizing the allotment area or on the east side of the Crazy Mountains. (Refer to the Biological Assessment located in the Project File (Chapter 10-C-1) for further discussion on threatened and endangered species).

Sensitive species are organisms whose population viability is of concern to the Regional Forester. Five birds, 3 mammals and 23 plants are identified as sensitive species on the Gallatin. Sensitive species such as harlequin ducks, trumpeter swans, and Townsend's big-eared bats do not inhabit the allotment. Suitable habitat may be present for boreal owls, flammulated owls, black-backed woodpeckers, and wolverines. Peregrine falcons are rare on the District. Currently, there are no records of peregrine sightings or nesting on the allotment or the east side of the Crazy Mountains. Surveys for sensitive animals have not been conducted on the allotment.

A sensitive plant survey was conducted on the Crazy Allotment in June of 1997 by a contract botanist. No sensitive species were found at that time. Pink agoseris has been recorded north of the allotment on the adjacent Big Timber Allotment, but information on other plant species is unavailable.

For further discussion on sensitive species refer to the Biological Evaluation, located in the Project File (Chapter 10-C-1).

Threatened and Endangered Species

Wolf/Livestock - Depredation/Conflict/Mortality:

All wolf issues have been dismissed - no wolves are currently known to be present on the allotment. See the BA, located in the Project File (Chapter 10-C-1). Neither Alternative 1 nor 2 would be likely to jeopardize the continued existence of the experimental gray wolf.

Livestock/Bald Eagle - Potential Nest and Perch Sites:

Concern was expressed during internal scoping that livestock grazing may limit the supply of nest and perch trees. Grazing impacts on riparian areas, specifically reduction of regenerating cottonwood trees, could affect perch and nest availability for bald eagles.

Riparian areas are an important component of bald eagle habitat. In Montana, nest and perch sites are generally distributed around the periphery of lakes and reservoirs ≥ 80 acres in area, but in forested corridors within 1 mile of major rivers (Wright and Escano 1986, as referenced in the Montana Bald Eagle Working Group 1994, pp 2 and 67, Jensen 1988, pp 21 and 35).

There are no large bodies of water and no known bald eagle nest sites within or near the allotment. Therefore, this issue has been eliminated from further study and will not be discussed in Chapter 3. See the BA, located in the Project File, Chapter 10-C-1). Neither Alternative 1 nor 2 would have any effect on the bald eagle.

Grizzly Bear/Livestock - Depredation/Conflict/Mortality/Attractants/Foraging:

All grizzly bear issues have been dismissed. - The allotment is located outside of the Grizzly Bear Recovery Zone, and no grizzly bears are known to inhabit the allotment or other portions of the Crazy Mountains. See the BA, located in the Project File (Chapter 10-C-1). Neither Alternative 1 nor 2 would be likely to adversely affect the threatened grizzly bear.

Lynx/Livestock – Habitat/Prey Reduction

Although the allotment is located within suitable lynx habitat, no sightings of lynx have been documented on the east side of the Crazy Mountains. The allotment does not contain any critical habitat for lynx nor would continued grazing change the forage base for lynx or their primary prey species.

For these reasons, it has been determined that neither Alternative 1 or 2 would be likely to adversely affect the threatened Canada lynx.

Sensitive Species

Livestock/Sensitive Wildlife and Amphibians:

There is concern that livestock grazing may adversely impact sensitive wildlife species. On the Gallatin National Forest, the wildlife species listed as sensitive are: wolverine, peregrine falcon, western big-eared bat, boreal owl, flammulated owl, black-backed woodpecker, trumpeter swan, harlequin duck, and northern goshawk. A biological evaluation was completed to address the effects of grazing on sensitive species on the allotment. The conclusion of that analysis was that grazing would either have no impact or would not cause a trend toward federal listing or loss of viability of any sensitive species.

Consequently, this issue has been eliminated from further analysis and will not be discussed in Chapter 3. For additional information, see the Biological Evaluation, located in the Project File (Chapter 10-C-1). Neither Alternative 1 or 2 are likely to cause a trend toward federal listing or loss of viability of any sensitive wildlife species.

Livestock/Sensitive Plants:

Livestock may affect sensitive plants by grazing, trampling, grazing induced changes in micro-site conditions, and altering competition factors between plant species.

Twenty-three sensitive plant species are listed for the Gallatin National Forest. Of these species, hiker's gentian is the only species that may be present on the allotment and potentially impacted by livestock grazing. However, hiker's gentian has never been documented on the allotment. Livestock grazing may adversely impact individuals or habitat for this species but is not likely to cause a trend to federal listing or loss of viability.

A sensitive plant survey was conducted on the allotment by a contract botanist for the Gallatin National Forest. Sensitive plant species were not discovered during the survey.

Consequently, this issue has been eliminated from further analysis and will not be discussed in Chapter 3. For additional information, see the Biological Evaluation, located in the Project File (Chapter 10-C-1). Neither Alternative 1 nor 2 are likely to cause a trend toward federal listing or loss of viability of any sensitive plant species.

Other Wildlife Species

Cattle/Bighorn - Forage Competition/Disease Transmission/Population Viability:

All bighorn sheep issues have been dismissed; bighorn sheep do not inhabit the allotment.

Cattle/Bison - Forage Competition/Brucellosis Transmission/Structural Damage:

All bison issues have been dismissed; bison do not inhabit the allotment.

Livestock/Deer - Forage Competition:

There is a concern that livestock could compete with mule deer for forage and adversely affect deer populations.

Mule deer are found on the allotment during all seasons. However, they differ from cattle in forage preferences and in how they use the landscape. Cattle prefer grass or grass-like plants for forage. Studies on mule deer found that emerging grasses were important very early in the spring, forbs dominated their summer

diet, and their use of shrubs gradually increased from late summer to late winter (Pac et al. 1991). Hamlin and Mackie (1989), in another Montana study, also found the greatest dietary overlap between cattle and deer to be in April and May, but found little overlap in the primary use areas of these two species. He did not find evidence that cattle adversely affected mule deer populations. Cattle are not on the allotment until July 1, consequently, dietary overlap is low.

Mule deer and cattle also use the landscape differently. Cattle tend to concentrate and use open grasslands and ridge tops and riparian areas with low to moderate slopes - a relatively small portion of mountain landscapes. Mule deer are solitary (as individuals or in small family groups), widely dispersed, and utilize a greater amount of forest, steeper slopes, and less accessible areas (Mackie 1985). Ganskopp and Vavra (1987) found site avoidance started at 20% slopes by cattle compared to 40% slopes by mule deer.

There may be some potential for livestock to adversely impact mule deer through forage competition in riparian areas where cattle tend to concentrate. Cattle can damage riparian woody vegetation by both browsing and trampling (Kovalchik and Elmore 1992, Clary and Webster 1989). This may affect the availability of browse for winter mule deer. Cattle have impacted some riparian areas and shrub communities on the allotment. Although there may be some competition for browse, the level is expected to be low due to the dispersal of cattle and deer on the allotment.

Due to the lack of and level of competition based on dietary overlap and use of the landscape, livestock grazing has been determined to cause only a minor effect on mule deer that inhabit the allotment. Therefore, this issue has been eliminated from further analysis and will not be discussed in Chapter 3.

Cattle/Elk - Forage Competition:

Due to the similarity in diet between cattle and elk (Hansen and Reid 1975:43m 46, Kasworm et al. 1984), there is concern that livestock may compete with elk for forage and adversely affect elk populations.

During the summer the potential for direct forage competition is reduced due to seasonal differences in diet and habitat use. Cattle prefer grass or grasslike plants (Mackie 1970:69, Stevens 1966:358, Hansen and Reid 1975:43), while forbs dominate the summer diet of elk (Mackie 1970:63-64, Leege 1984:2 and 28, Edge et al. 1988:575, Stevens 1966:357). Mackie (1970:72) also found that although cattle and elk use similar habitats in the spring and fall, they use different habitat during the summer.

During winter, elk have a diet preference for grass (Mackie 1970:62, Constan 1972:1074), and there is some potential for indirect forage competition. Summer

grazing on grasses by livestock removes forage that could be utilized by elk during winter months.

In general, several factors contribute to effectively mitigate the potential of summer cattle grazing removing elk winter forage. Although in winter elk prefer a high proportion of grass, the areas grazed by cattle during the summer and by elk during the winter are often disparate (Hoskins and Dalke 1975:223). Summer cattle grazing commonly occurs on flats, bottom lands, lower slopes and finger ridges, flat broad ridge tops, and slopes less than 25 percent, often within 0.5 miles of water (Julander and Jefferey 1964:408-412, Stevens 1966:362, Mackie 1970:47-50). Elk winter foraging typically occurs on south slopes and open, windswept ridges free of snow cover (Hoskins and Dalke 1975:223, Stevens 1966:353, Mackie 1970:41-43). These areas receive little use by cattle. What use does occur often takes place early in the growing season. This early use allows time for regrowth. The areas typically grazed by cattle during summer months are often unavailable for elk grazing due to snow depth and crushed condition. Elk respond to crusted snow conditions by switching from grasses to more available browse or by moving to forested areas where lesser snow accumulation or thermal regimes reduce snow crust formation (Stevens 1966:353, Mackie 1970:42). Elk are considered mixed feeders, have a generalists diet, and are capable of utilizing grasses, forbs, and browse as availability dictates (Hobbs et al. 1981:169, Morris and Swartz 1957, Young 1938, and Lovaas 1963 as referred to by Mackie 1970:64).

Elk inhabit the allotment during late spring, summer and fall. Elk generally do not inhabit the allotment during winter months. Elk are widely distributed on private and Forest Service land during spring, summer, and fall. Much of the private land has been logged and is in an early stage of plant succession, which provides abundant forage for elk. Elk winter at lower elevations primarily on private land located off the allotment.

Due to the low occurrence of direct and indirect competition based on the amount of seasonal dietary overlap and habitat use, livestock grazing impacts on elk will be minor. Consequently, this issue has been eliminated from further analysis, and will not be discussed in Chapter 3.

Cattle/Elk - Space Competition:

Research indicates a tendency for elk to avoid areas where cattle are present and to forage in pastures rested from cattle grazing. There is a concern that livestock grazing may displace elk into poor quality habitat.

Although some researchers report cattle and elk feeding in proximity to one another, the consensus of many researchers is that elk avoid areas currently being occupied, or recently grazed, by cattle (Mackie 1970:73, Leege et al. 1984:7).

The potential for competition for space was reviewed as a function of diet, physiology, and distribution of the two species during the livestock grazing period. The differences in habitat use during the grazing period reduces the potential for direct conflict: 1) during the summer cattle are foraging on grasses, and elk are primarily utilizing forbs; and 2) elk often utilize forested habitats in summer for feeding, thermoregulation, and relief from insects, while cattle commonly utilize shrub/grassland areas.

Elk inhabit the allotment during late spring, summer and fall. Elk generally do not inhabit the allotment during winter months. Elk are widely distributed on private and Forest Service land during spring, summer, and fall. Much of the private land has been logged and is in an early stage of plant succession, which provides abundant forage for elk. Elk winter at lower elevations primarily on private land located off the allotment.

Although elk are widely distributed on the allotment, on both private and Forest Service land, there are only minor effects associated with cattle and elk competition for space. For these reasons, competition for space between cattle and elk will be minor and the issue has been eliminated from further study, and will not be discussed in Chapter 3.

Elk/Livestock - Disease Transmission:

An issue that has previously arisen is the concern that elk may transmit brucellosis to cattle, causing Montana to lose its brucellosis-free status. The USDA Forest Service has no authority to manage big game on the National Forest.

This issue is beyond the scope of the analysis and has been dismissed.

Livestock/Moose - Riparian Woody Vegetation:

Livestock grazing has the potential to adversely affect riparian shrub vegetation utilized as forage by moose. Moose may be found on the allotment during summer months. Although some riparian areas on the allotment have experienced impacts from cattle grazing, riparian vegetation is generally in good condition overall.

Because moose forage on a wide variety of shrubs (small conifers, upland shrubs, and riparian shrubs), and because most riparian areas are in good condition, this issue has been eliminated from further analysis and will not be discussed in Chapter 3.

Pronghorn/Cattle - Forage Competition:

An issue was raised that pronghorn antelope and cattle may compete for forage.

There are no antelope on the allotment. Therefore, this issue has been dismissed from further analysis.

Livestock Fences/Big Game and Raptors:

Early external scoping brought up the issue of the potentially negative impacts of fences on wildlife, from big game to forest raptors. The issue links fences to raptor mortality. In terms of effects of fences on big game, the Forest Service complies with Forest Manual standards, which allow for big game passage. Therefore, this effect is mitigated. Although it is somewhat difficult to assess the full impact of fence related mortality, the literature does not support high levels of raptor or other bird mortality due to fencing (Allen 1990). There are a very limited number of miles of fence on the allotment and all new proposed fencing will incorporate mitigation measures to reduce potential mortality and ensure passage.

Therefore, this issue has been eliminated from further analysis and will not be discussed in Chapter 3.

Livestock/Small Mammals:

Cattle grazing may reduce ground cover on suitable range and change vegetation species, composition, density, and structure. There is a concern that a diversity of small mammal fauna will not be maintained. Livestock grazing may have altered what were diverse small mammal communities so that species that tolerate low cover levels dominate.

Cattle are primarily grazing animals. Grazing reduces grass quantities and may modify vegetation composition with shrubs increasing. These changes can affect the food resources for small mammals and may also affect their vulnerability to predation. In the true prairie, Risser et al. (1981, pp. 366-370) found that the amount of vegetative cover, both standing and in the litter layer, affected mammalian species composition. Plant composition does not appear to be of primary importance to the existence of small mammal populations in grasslands.

Small mammal communities in tall grass and montane habitats appear to be more affected by grazing than in shortgrass and bunchgrass habitats. In a study comparing grazed versus ungrazed sites on four North American grassland sites, small mammal biomass decreased under grazing on tall grass and montane sites, but remained relatively unaffected on bunchgrass and shortgrass habitats (Grant et al. 1982). The grazing areas on the allotments are primarily a combination of bunchgrass and montane habitats.

Some species of small mammals benefit from less grass being present, while others are adversely affected. In comparing grazed and ungrazed riparian habitats in Idaho, Medin and Clary (1990) found small mammal populations a third higher on grazed areas, but species diversity was higher in the ungrazed habitats. Deer mice (*Peromyscus maniculatus*) increased while the Montane vole (*Microtus montanus*) and minor species decreased. Matlock-Cooley (1993, p. 68) stated that deer mice are generalists and are adaptable to changing situations. In bitterbrush sites she found that deer mice moved out of bitterbrush areas into grazed areas immediately after grazing, taking advantage of new areas with potential food sources and passageways.

On the allotment, grazing may have altered small mammal communities inhabiting primary rangeland where over-utilization has occurred. The reduction in vegetative cover by grazing has decreased the amount of suitable habitat for herbivorous, litter-dwelling mammals (*Microtus* spp.). Conversely, habitat has improved for those species that do well with more open habitats. The result is likely similar to what Medin and Clary (1990) found with increased deer mice populations and decreased populations of voles and minor species.

Although there are localized impacts, the effects of grazing to small mammals are mitigated on a landscape level basis. High use areas constitute less than 5% of the allotments. Additionally, only a portion of the grassland areas on the Gallatin National Forest are grazed. As long as livestock does not graze all areas of similar vegetation at the same time or to the same extent, and there are areas ungrazed by livestock, small mammal diversity will be maintained. There are approximately 1.5 million acres of vegetated land on the Forest. Of this land, less than 10% is classified as suitable livestock range within active allotments (RAMIS data 1995). There is also additional private land acreage not being grazed within the Forest boundary. The maintenance of a diverse mammal fauna on the Forest is assured by the availability of many acres of suitable small mammal habitat that is not grazed by livestock on the forest.

Consequently, this issue has been dismissed as having a minor effect, and is eliminated from further analysis, and will not be discussed in Chapter 3.

Livestock/Other Management Indicator Species:

Internal scoping brought up the issue of effects of livestock grazing on Management Indicator Species (MIS). The pine marten and northern goshawk are discussed under this issue. MIS species (elk, grizzly bear, bald eagle, and wild trout) are addressed separately under other issues.

Although not common, the pine marten and northern goshawk are found Forest-wide where suitable habitat exists. These habitats consist primarily of mature and

old-growth forest. Heavily timbered habitats seldom produce much forage and are considered unsuitable for livestock grazing.

Therefore, this issue has been dismissed from further analysis and will not be discussed in Chapter 3.

Livestock/Neotropical Migratory Birds - Nesting Habitat/Food Resources:

Some species of neotropical migratory birds have declining population trends. There is a concern that livestock grazing may contribute to the habitat loss of neotropical migratory birds.

An analysis focused on the species of concern, those bird species undergoing decline in Montana during 1966-1994 or 1980-1994 (National Biological Survey 1995). The potential for any of these species to occur on the allotment was reviewed. In 1994 and 1995 a survey of neotropical migratory land birds was conducted on the Gallatin National Forest. Of those species declining in Montana, five species could be found in the grazed areas of the allotment - the American redstart, cedar waxwing, lazuli bunting, MacGillivray's warbler, and warbling vireo. Although these species are declining, none show a statistically significant decline.

Possible direct effects on bird species by cattle grazing include:

- 1) General alteration of vegetation structure or reduction in cover (grasses, shrubs, and young trees) used for nesting and foraging.
- 2) Trampling of ground nesting birds and young, or disturbance that may lead to nest abandonment.

Other indirect effects on birds by cattle grazing include:

- 1) Loss of vegetation, which supports insect prey,
- 2) Loss of prey abundance from pesticide applications.
- 3) Loss or alteration of vegetation due to change in ecosystem processes (e.g. fire suppression, non-rotational herbivory, water developments, and irrigation).
- 4) Facilitation of nest parasitism.

Because birds are most responsive to change in the physical structure of their habitat, the greatest potential impact on birds from livestock will occur where grazing alters the structure of the nesting or foraging habitat (Bock et al. 1992). For the above 5 species at risk, Bock et al. (1992) reviewed the literature and found that all were affected by grazing. The key to maintaining all five species is to sustain grazing levels ranging from none to moderate grazing in all grazed habitats.

Grazing impacts on declining species of neotropical migratory birds found on the allotment are summarized below:

Table A-1 Grazing Impacts on Neotropical Migratory Birds

Species	General Habitat	Factors In Decline (Dobkin 1992)	Impact of Grazing On Allotments
American Redstart	Open deciduous and mixed deciduous-conifer forest.	Nest parasitism from brown-headed cowbirds.	Negligible impact. Deciduous habitat affected have only a minor affect from grazing.
Ceder Waxwing	Open habitats with berries; riparian, deciduous or coniferous woodlands.	Nest parasitism from brown-headed cowbirds.	Negligible impact. Berry producing shrubs and deciduous habitat only affect a minor amount of grazing.
Lazuli Bunting	Open woodlands; brushy areas; riparian thickets.	Nest parasitism from brown-headed cowbirds.	Minor grazing impact on nesting/foraging habitats.
MacGillivray's Warbler	Riparian thickets.	Nest parasitism from brown-headed cowbirds.	Minor grazing impact on nesting/foraging habitats.
Warbling Vireo	Riparian forest and thickets; deciduous-coniferous woodlands.	Aspen loss; pesticides, nest parasitism from brown-headed cowbirds.	Negligible impact. Nesting and foraging habitat not impacted.

All five species are known to suffer some degree of nest parasitism by brown-headed cowbirds.

Due to the minor affect of grazing, this issue was eliminated from further analysis and will not be discussed in Chapter 3.

Livestock/Neotropical Migratory Birds - Nest Parasitism:

Nationally, many species of neotropical migratory birds show declining population trends. Terborgh (1992) has attributed a major portion of this loss to increased nest predation and parasitism. The brown-headed cowbird associated with livestock and/or short grass, is a brood parasite that lays its eggs in many host bird nests. There is a concern that livestock grazing will expand the range of cowbirds

onto the Forest and result in additional loss of neotropical migratory birds through brood parasitism.

During the breeding season, brown-headed cowbirds prefer grassland vegetation, particularly in the presence of livestock, with scattered trees or low vegetation such as forest edges, thickets, and riparian corridors. Cowbirds feed in short grass and bare ground and parasitize nests in woodlands and thickets, showing a preference for human-modified habitats and grassland/woodland ecotones. Breeding habitats include short grass prairie, agricultural fields, pastures, lawns, recent clearcuts, orchards, tree plantations, fencerows, powerline corridors, and pack horse stations. Cowbirds have been recorded at 7,200 feet in the Bridger Mountain Range (Moore 1991) and up to 9,500 feet in Colorado (Hanka 1985). Female cowbirds will also enter forest areas to search for host nests (Terborgh 1992). In the Sierra Nevada Range, female cowbirds were recorded commuting up to four miles between feeding areas and woodlands (Rothstein et al. 1984).

Egg laying and incubation for neotropical migratory birds primarily occurs April through July 15 (Paige 1995). Under the proposed action, the annual season of use for cattle grazing begins July 1. Cowbird parasitism may occur off the allotment during April through early July, but only as a minor occurrence on the allotment since the nesting time period falls at the outside the permitted time frame. Private land in the vicinity of the allotment consists of ranches with cattle, sheep, and horses and small farmlands. Human development on private land in the allotment vicinity is suitable for brown-headed cowbirds during the breeding season. Cowbirds will parasitize nests within four miles of ranches and small farms where cattle grazing is occurring on private land.

Therefore, cattle grazing may have an effect on the increase of brood parasitism from brown-headed cowbirds near the allotment on private land and a minor effect as a result of the allotment. This issue has been eliminated from further analysis and will not be discussed in Chapter 3.

Livestock/Upland Game Birds - Plant Succession/Stubble/Insects:

A concern was expressed that livestock grazing may have an adverse effect on upland game birds by modifying plant succession in shrublands or forested areas and may also alter stubble height. Range management practices may also affect availability of insects, which are important food for young upland game birds. This potential issue was directed primarily at sage grouse, a species that is not known to inhabit the Gallatin National Forest, although it does occur at lower elevations below the Forest boundary.

Because sage grouse do not inhabit the Forest, this issue has been eliminated from further analysis.

Livestock/Beaver Conflicts With Restoring or Reintroduction of Native Species:

There is a concern that livestock grazing may conflict with the restoration or reintroduction of beaver.

There is evidence that beaver were historically present on the allotment. There are stream courses that show signs of old beaver activity such as cuttings along stream banks. This evidence is very old and beaver are no longer present on the allotment. However, there is no evidence that their absence is attributed to livestock grazing. The loss of beavers from this area was probably attributed to overtrapping and disease. In addition, most suitable ground in and near the allotment is associated with private lands along stream courses.

The district does not propose to reintroduce beavers on the allotment at this time or in the foreseeable future. Therefore, this issue has been eliminated from further analysis and will not be discussed in Chapter 3.

G. RECREATION

Livestock/Degradation to Recreation Facilities

Concern was expressed that recreation facilities will be damaged or degraded by livestock on the allotment.

No recreation facilities exist on the allotment; therefore impacts to recreation facilities from livestock can be dismissed and eliminated from further analysis.

Livestock/Recreation User Conflicts

The area within the Crazy Allotment receives little recreational use. There is no public road access on the allotment. There is some potential that the presence of livestock could negatively affect the experience of recreation users on the forest. However, this is tempered by the fact that recreational use is very low within the allotment. Hikers, fishermen, and campers using NFS lands may come across cattle. However, this would not be a new situation and hasn't presented a problem in the past. Livestock could displace wildlife species sought by big game hunters. However, with the exception of the first week or two of bow season, cows are off the allotment during the fall hunting season,

Livestock could hinder bow hunters during this period from bugling and sneaking up on game. Given the low recreational use in these areas, however, and the fact that the Forest Plan allocations provide for such mixed uses to coexist in these areas, this issue can be eliminated from further study.

Livestock/Roadless

Concern was expressed that the presence of livestock could inhibit the designation of this area as wilderness. The western half of the Crazy Allotment is within inventoried Roadless Area 1-541. Because of checkerboard ownership patterns in this portion of the Crazies, no past legislation has proposed designation of this area as wilderness. Furthermore, the Wilderness Act of 1964 expressly states that grazing may continue in designated wilderness areas if grazing occurred prior to designation. Grazing therefore, has no bearing on roadless or wilderness classification or designation.

For these reasons, this issue has been eliminated from further detailed analysis.

Recreationist/Allotment Structure Degradation

Concern was expressed that recreationists will damage allotment fences and gates. Vandalism to range improvements has not been reported on this allotment. Low levels of public use make improvements less vulnerable. Gates being left open have not been a problem, as most use occurs during hunting season after the cattle have been removed from the allotment.

For these reasons this issue has been eliminated from further analysis.

Permitted Livestock/Recreation Livestock, Competition for Forage

Concern has been expressed that recreational stock uses much of the forage or overgraze certain areas. Very few recreational stock use the area. Therefore, there is little potential for cows to compete for forage available to recreation stock or vice versa. There has never been a reported problem on the allotment regarding livestock/recreation stock competition for forage. Proposed mitigation in the Crazy Allotment EA, Alternative 2, should eventually bring all areas to within Forest Plan Standards.

For these reasons, this issue has been eliminated from further detailed analysis.

H. HERITAGE

Livestock/Heritage Resource - Physical Impacts to Sites

There was concern that livestock could negatively impact heritage resources. There are known heritage resource sites in the allotment area. During recording and survey of these sites, no mention was made that grazing has adversely affected the integrity of these sites, and no negative effects to known sites would be expected from the proposal. If any ground excavation were to occur, such as constructing an alternative water site, a heritage survey would be conducted to assure that no sites are disturbed.

For these reasons, this issue has been eliminated and will not be studied in detail during this analysis.

I. SOCIAL

Livestock/Socio-Economic Importance and Effects

There is concern that livestock grazing may be reduced or may no longer be allowed on Forest Service administered land. The grazing associated with this allotment is an important part of a local cattle ranching operation. The income from calves raised, in part, on the private and federal lands combined grazing allotment contributes to the permittee, to the local economy, and to local economic stability.

The effect of the No Action Alternative on meadow and upland areas include a negative effect to permittee income. The complex checkerboard ownership of this allotment makes fencing difficult and expensive. Fencing along all of the property boundaries would likely place fences in undesirable locations (areas not related to natural terrain or vegetation). The costs to the landowner would include potential lost revenue from cattle production and the increased cost of building the interior fences needed to separate private land within the Forest Boundary. At \$6000.00 or more per mile, and with an estimated 4–12 miles of fencing, these costs are deemed very high.

The proposed action would provide for continued grazing on the allotment and therefore would not have a significant negative effect. Livestock numbers would be lower than historic numbers in order to meet the projected carrying capacity of the land.

L. WILDFIRE

Livestock/Wildfire

Concern has been expressed regarding the potential for increased wildfire, which could possibly result from the exclusion of grazing on the Crazy Allotment (Alternative 1, No Action). It is unlikely that implementation of Alternative 1 would have any effect on increasing the potential for increased wildfire in this area. Rates of spread for wildfire might increase slightly if fine fuel areas (grasslands) are not grazed by cattle. The total area affected by grazing on the allotment (suitable range) is about 20% of the total allotment acreage. Grazing on the suitable range would somewhat reduce the fine fuels available to contribute to a fire.

For these reasons, this issue is considered of minor importance and will not be discussed further in this document.

Livestock/Natural Fire Regimes

Concern has been expressed that present and historic livestock grazing has resulted in disruption of natural fire regimes. Little research has been conducted to determine the effects of grazing on fire starts, fire frequency, or fire rates of spread. Conventional wisdom holds that a reduction in light fuels, primarily grasses, would tend to slow fire spread. Lightning striking green trees on mid-slope areas of southeast, south, or southwest aspects causes the majority of natural ignitions on the Gallatin National Forest. The strike travels down the tree and ignites a dry needlecast or grassy fuel-bed.

The Gallatin National Forest contains approximately 1,763,000 acres of federal land, interspersed in places, with parcels of private land. Of the federal land acres, approximately 135,000 acres are suitable livestock range on allotments, actually grazed by livestock, (RAMIS, Gallatin National Forest, 1998. These figures do not include outfitter-guide or recreation horses and mules). This is less than 8% of the total Gallatin land base, leaving 92% of the Gallatin ungrazed by livestock and unaffected by a reduction in light fuels. Suitable range typically can be found in grassy meadow areas in valley bottoms or adjacent open or timbered lower slopes with relatively high herbaceous production. Valley bottoms are naturally somewhat "fire resistant" because of the higher humidity associated with streams and rivers even though there is greater vegetation biomass (grasses, shrubs, and trees) in these areas.

Human intervention by way of overt fire suppression has undoubtedly been the major influence on the disruption of natural fire regimes on the Gallatin National Forest. Early vegetation mapping (Leiberg, 1903) indicates that prior to Eurasian settlement of the area surrounding the Gallatin National Forest, fires were large,

and fire events were frequent. Intensified fire suppression efforts began about 1910 and have continued to the present. Until the National Fire Danger Rating System index reaches 97%, (extreme drought) fire suppression efforts are usually successful. When the NFDRS rating exceeds 97%, as it did in 1988, 1991, and 1994, suppression becomes nearly impossible. Fires during these years burned across both grazed and ungrazed areas with great ferocity despite reduced light fuel levels in grazed areas and in the face of heroic human fire-fighting efforts.

Because livestock grazing affects only 8% of the Forest, and because wildfires in all but the most extreme cases are put out by humans, this issue has been eliminated from further analysis and will not be evaluated in Chapter 3 of this document.