Chapter 3

Affected Environment and Environmental Consequences

I. Introduction

Chapter 3 describes the physical, biological, and human resources of the environment that may be affected by the alternatives presented in Chapter 2, and the environmental effects that the alternatives may have on those resources. Affected Environment and Environmental Effects have been combined into one chapter to give the reader a more concise and connected depiction of what resources exist in the project area, and what the effects to those analysis forms the scientific and analytic basis for the comparison of alternatives shown at the end of Chapter 2.

II. Past, Present, and Reasonably Foreseeable Future Activities

The Council on Environmental Quality (CEQ) regulations implementing NEPA require that federal agencies consider three types of actions: (1) ***connected actions***, which are two or more actions that are dependent on each other for their utility; (2) ***cumulative actions***, which when viewed with other proposed actions may have cumulatively significant effects, and should therefore be analyzed together; and (3) ***similar actions***, "which when viewed with other reasonably foreseeable or proposed actions, have similarities that provide a basis for evaluating their environmental consequences together." (40 CFR 1508.25(a)).”

The agency is not required nor is there a benefit to a rendering of all effects from all actions that have impacted a particular resource regardless of whether the proposal under consideration contributed an additive effect. Recent guidance from the Council of Environmental Quality (CEQ), Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, (6/24/2005, states “Generally , agencies can conduct adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.. “The environmental analysis required under NEPA is forward-looking, in that it focuses on the potential impacts of the proposed action that an agency is considering. Thus, review of past actions is required to the extent that this review informs agency decision making regarding the proposed action. This can occur in two ways. First, the effects of past actions may warrant consideration in the analysis of the cumulative effects of a proposal for agency action. CEQ interprets NEPA and CEQ’s NEPA regulations on cumulative effects as requiring analysis and a concise description of the identifiable present effects of past actions to the extent they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have a continuing, additive, and significant relationship to those effects.”

Historical Activity and Uses

Past activities within the project area include fire suppression, timber harvest and associated roadbuilding, wildlife management by permit, and livestock grazing that has been ongoing for the last 100 years. Open range laws and lack of fences undoubtedly led to heavy grazing throughout the area. Fire suppression, along with grazing, altered plant communities' biomass production, species composition, and diversity. Conifers have encroached into non-forested areas historically kept from climax conditions with frequent fire. Noxious weeds were introduced and infestation levels have increased in some areas. Past logging and road building have also contributed to altered habitats in some areas of the allotments. Wildlife management of big game populations by permit has evolved to present day permits, seasons, and protections.

Current Activity and Uses

The Fridley Creek Allotment is being used for summer cattle grazing and is an integral part of the permittees livestock operation. The allotment is currently being grazed by a total of 238 cow/calf pairs (96 Forest Service and 142 Private land permit), for a grazing period of 7/1 – 10/15 annually. This allotment is grazed under a season-long system. Distribution is managed through riding and salting.

Lewis Creek Allotment was being grazed by a total of 22 cow/calf pairs for a season of 7/1 – 10/15 annually. This allotment was grazed under a deferred-rotation system with two pastures. Distribution was managed through riding and salting. The past three years (2003-2005) there has been no grazing on this allotment.

The Sunnybrook Allotment was first issued a special use permit in 1937 for 10 animal months for three months. This pasture had very heavy use. In 1971, the special use permit was changed to a temporary grazing permit and the Sunnybrook Allotment was designated. From 1971 to present, this allotment is used in conjunction with a NRCS grazing rotation for the private landowners. Presently, these activities continue to this day on National Forest although livestock numbers are probably at their lowest.

Logging, farming, ranching, and development continue on private lands. Perhaps the most predominant human influences on vegetation in the analysis area are logging (mostly on private land in the Fridley Creek Allotment) both in the riparian areas as well as the upland areas.

In the winter of 2004-2005, in Section 4 T6S, R7E of the Fridley Creek Allotment, the Forest Service implemented the Golmeyer Sanitation Salvage Sale. There is approximately 30 acres of Douglas-fir bark beetle salvage that was completed in early March 2005.

Much of the project area does not provide for public access and therefore limits administrative management as well. There are several trails and logging roads in this analysis area, but these are not open to the general public. Public access is by permission across the private land. Several day-use outfitting guides utilize the trails throughout these allotments.

The Fridley Fire burned approximately 1500 acres of the Fridley Allotment in 2001. Wildfires have a high potential of introducing noxious weeds. The Forest Service has been monitoring for weeds after the fire for the last three years.

The Lower Big Creek portion of the Paradise Valley Fuels Management and Prescribed Burning Project (approximately 610 acres) is adjacent to southern portion the Lewis Creek Allotment in Section 12 and consists of a mixture of prescribed burning and slashing of small diameter trees and shrubs in order to reduce fuel loadings. This project began in 2002 and is ongoing.

All of these activities may disturb vegetation locally. These disturbances are usually small in scale and not long-term. However, the introduction of noxious weeds associated with these activities may have more lasting effects.

Potential Future Activity and Uses

Other than the Paradise Valley Fuels Management Project described above, the Forest Service is not currently planning any projects within the allotment boundaries other than grazing and weed treatments and has no plans for any timber harvest, road building, or other developmental activity.

Grazing of the allotments is proposed to continue under the conditions described in the action alternatives. Weed treatments will continue as a part of the regular district weed management program. Recreation in the form of fall hunting and trail riding will likely continue.

Any future federal actions in the project area that are not being considered at this time, will undergo a separate analysis, based in part on an understanding of the consequences to wildlife habitat incurred by the proposed project.

Reasonably foreseeable actions that may occur within the project area on private lands include increased subdivision, private land development, and subsequent loss of habitat for migratory birds and other wildlife species. Private lands will continue to conduct agricultural activities such as farming and ranching. Grazing by wild ungulates will continue as will the hunting seasons managed by the State of Montana Department of Fish, Wildlife, and Parks. No specific areas have been identified for these activities at this time. The Forest Service has no control over activities occurring on private land outside of the allotment boundaries.

III. Affected Environment

This section describes the environment surrounding the Fridley Creek, Lewis Creek, Sunnybrook, and proposed Dry Creek Allotments, which may be affected by the proposed action or its alternatives. It includes a discussion of natural resources, Forest Plan goals and objectives, and other management activities.

A. Vegetation

Significant Issues # 1 and #2 pertain to the negative effects that livestock grazing are having on riparian vegetation and seep and spring habitat in some areas within the allotments. Streamside habitats, wet meadows, seeps, and springs all attract migratory bird species, wildlife and livestock. Riparian areas are used as foraging sites, nesting habitat, and cover. Optimal riparian dominated vegetation consists of native grass-like plants, grasses, forbs, and shrubs. The majority of the areas expressing riparian dominated vegetation, with some isolated exceptions, are in good condition on the Fridley, Lewis, and Sunnybrook Allotments due to inaccessibility to livestock. Riparian vegetation has been impacted around water developments where livestock have access and along some stream reaches that are currently dissimilar to the potential natural vegetation. Impacts at these sites include introduction of non-native species, bare ground, reduced vigor of shrubs, decreased structural diversity, and altered vegetation composition.

The majority of riparian habitats on the Fridley, Sunnybrook, and Lewis allotments are only lightly impacted by cattle. These include: Big Creek, Lewis Creek, and Hyalite Creek, Dry Creek, Fridley Creek, Miller Creek, and an unnamed creek in Section 6. These areas exhibit a high similarity to the potential natural community. They are either inaccessible to livestock, produce forage that is not suitable for livestock, or are grazed only in passing and not used for extensive periods for loafing and shade.

There are also reaches identified as low to moderate similarity to the potential natural community, which are Mill Fork Creek, Upper Miller Creek, South Fork Miller Creek, North Fork Miller Creek, Golmeyer Creek, and an unnamed creek in Section 34. Livestock have concentrated in these productive and accessible streamside areas, modifying vegetation communities in these areas.

Based on ocular estimates, site visits, and past monitoring data, upland vegetation is generally in good condition on all of the allotments and does not trigger any significant issues. Only a few small isolated areas are outside of LRMP goals and objectives. Concerns related to uplands are discussed in Appendix A, pp. A-1 through A-11 of this document.

Fridley Creek Allotment

Suitable vegetation types (approximately 3,690 acres) within the Fridley Creek Allotment range from open, rolling grasslands and sagebrush hills to areas of forested range with a

bunchgrass understory. Most of the suitable range[1] occurs between an elevation of 5,000 and 7,000 feet. There are a variety of clear cutting units on the private land throughout the area as well as a selective beetle kill harvest unit on the Forest Service lands.

Uplands are generally in good condition. Vegetation that increases with disturbance, such as dandelion, western yarrow, and Kentucky bluegrass are minor components of the plant community found in moist meadows. Many of the grassland parks are being encroached by conifers (field observations 2003). Timothy is a dominant nonnative species in areas of deeper soils. Historically, timothy has been seeded in disturbed areas to reduce erosion, and create forage for livestock. Whatever the reason for its establishment, it has taken over many areas. Timothy is now considered to be a part of the native community but is not a preferred species. The dominant upland habitat on this allotment is Douglas-fir/snowberry. This habitat type was only found in primary range and it covers 1,820 acres of the allotment. The next dominant habitat type was big sagebrush/Idaho fescue and it covered 926 acres of the allotment. The Idaho fescue/timothy habitat type was also found in primary range[2], (see Table A-1). This totals 3,139 acres of primary range, 1,247 acres of secondary range[3], 874 acres of transitory[4] primary range and no transitory secondary range. Analysis for upland vegetation can be found in other issues, Appendix A-1 through A-11.

Riparian areas are in generally good condition. There are a variety of creeks and small springs on this allotment. There are two streams, however, that show impacts from cattle and other sources. The dominant riparian habitat for Fridley Creek and the lower section of Miller Creek is mountain alder/red osier dogwood. This habitat type has a high inherent stability. North and South Forks of Miller Creek consist of Kentucky bluegrass, which has a very poor ability to hold together stream banks. Golmeyer has a willow community associated with the stream, having a relatively high inherent stability. A no name creek riparian area in section 34, T5S, R7E near the forest boundary also has a Kentucky bluegrass habitat like the North and South Forks of Miller Creek.

Miller Creek is the most impacted from an adjacent road, grazing, riparian and upland timber harvesting on private lands and by the Fridley Fire. Some suitable rangeland exists along Miller Creek in Section 25. The geographic constriction and lack of other water sources on the uplands are the main cause of poor distribution and high utilizations of this creek.

Section 34, T5S, R7E has a small tributary of Golmeyer Creek that has also been heavily impacted. There is a boundary fence and a water tank in the riparian area. The cattle tend to congregate in this area and overutilize the riparian area. Lack of other water sources and poor distribution of livestock is the main cause of high utilizations of this creek.

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[1] Suitable range is or can be made accessible to livestock, produce or has inherent capabilities to produce at least 50 pounds per acre 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.

[2] Primary range is that part of the suitable range which livestock naturally prefer or will use first under management as it is readily accessible and has available water.

[3] Secondary range has characteristics similar to primary range, except it is seldom used because of accessibility, lack of water, management systems, or a combination of these.

[4] Transitory range is suitable range as a result of partial or complete removal of forest cover by logging, fire, insects, or disease.

Some riparian areas along Miller Creek have been heavily impacted and are currently in non-functioning condition. Past riparian harvest, road building, heavy livestock use, and the 2001 Fridley Fire have heavily impacted these areas. The Fridley Fire burned the upper reaches of the North and South Forks of Miller Creek. Previous to the fire, the upper reaches were heavily logged. A no name creek riparian area in Section 34, T5S, R7E near the forest boundary has been degraded. The aspen stands are old and decadent with no new growth, and the stream banks have been destabilized from trampling.

Noxious weeds inhabit the allotment and they do present some problems in terms of forage production and control measures. There are four separate weed infestations within the analysis area, which are generally associated with road systems. Canada thistle, musk thistle, black henbane, mullein and spotted knapweed are the dominant species, although a variety of other species are present. There is an active weed control program on the allotment, which primarily targets roadside applications.

Lewis Creek Allotment

The Lewis Creek Allotment is composed of sagebrush/bunch grass meadows on the south facing slopes and transitory grasslands on the north facing slopes from an old clearcut in Section 12. Section 6 consists of timber mixed with open bunchgrass parks, on the southern facing aspects, and the northern facing aspects are predominantly dominated with timber. The majority of timbered areas consist of Douglas fir and lodgepole pine. A bunchgrass understory is commonly found in the older stands of Douglas fir. Most of the suitable range (approximately 670 acres) occurs between 6,000 to 6,600 feet in elevation.

Uplands are generally in good condition. Vegetation that increases with disturbance, such as dandelion, western yarrow, and Kentucky bluegrass are minor components of the plant community found in moist meadows. Many of the grassland parks are being encroached by conifers (field observations 2003). The dominant upland habitat on this allotment is Douglas-fir/snowberry. This habitat type was only found in primary range and it covers 270 acres of the allotment. The next dominant habitat type was big sagebrush/Idaho fescue and it covered 220 acres of the allotment, and was also found in primary range, (see Table A-2). This totals 490 acres of primary range, 180 acres of secondary range, 125 acres of transitory primary range and no transitory secondary range. Analysis for upland vegetation can be found in other issues Appendix A-1 through A-11.

Riparian areas are generally in good condition. The dominant riparian habitat for both Lewis Creek and Hyalite Creek is mountain alder/red osier dogwood. This habitat type has a high inherent stability. Mill Fork of Hyalite Creek consists of Kentucky bluegrass, which has a very poor ability to hold together stream banks. There are a variety of creeks and small springs on this allotment. The main streams in this allotment are Mill Fork, Hyalite and Lewis Creek (which is not accessible to cattle). Mill Fork is the one stream that shows impacts from cattle. There is a small section of this creek that runs through the top NE corner of section 12. This is the main source of water for the cattle on this side of the pasture. The riparian corridor is steep and confined, and is very sensitive to trampling. Since the allotment has been vacant, the riparian vegetation has rejuvenated; however, this site is

still a concern if this allotment is to be grazed. Currently there are two water developments in the southwestern part of section 12. Grazing impacts to the other creeks (Hyalite and Lewis) are negligible to low.

Very few noxious weeds inhabit this area due to very few roads, the lack of access to the public and the vacancy of this allotment for the past three years. The dominant weeds presently found on the allotment are hounds tongue and Canada thistle. However, the noxious weeds will continue to be monitored and eradicated when possible.

Sunnybrook Allotment

The Sunnybrook Allotment is composed of sagebrush/bunchgrass meadows on the south facing slopes, small meadow parks, and open timbered areas. Most of the suitable range (approximately 357 acres) occurs at approximately 6,000 feet in elevation.

Uplands are generally in good condition. Vegetation that increases with disturbance, such as dandelion, western yarrow, and Kentucky bluegrass are minor components of the plant community found in moist meadows. Many of the grassland parks are being encroached by conifers (field observations 2003). The dominant upland habitat on this allotment is big sagebrush/ Idaho fescue. This habitat type was only found in primary range and it covers 277 acres of the allotment (see Table A-3). This totals 357 acres of primary range, no secondary range, no transitory primary range and no transitory secondary range

Riparian areas are in good condition. . Livestock impacts are negligible to low. The main streams in this allotment are Hyalite Creek, Big Creek and Lewis Creek. There are presently no water developments on this allotment. The dominant rangeland habitat for Lewis Creek, Big Creek and Hyalite Creek is mountain alder/red osier dogwood. This habitat type has a high inherent stability. These streams are either inaccessible or have little impacts allowing for them to have a desirable habitat.

Noxious weeds inhabit this allotment. The largest infestations are found along roadways and in a meadow in the NW corner of section 18, T6S, R7E (Field visit 2005). Hounds tongue and Canada thistle are the dominant weeds; although a variety of other species are present. The noxious weeds will continue to be monitored and eradicated when possible in conjunction with the permittee.

Proposed Dry Creek Allotment

As a part of Alternative 3 (Adaptive Management), a fourth allotment would be created. The new Dry Creek Allotment would incorporate section 4 T6S, R7E and section 32 T5S, R7E of the Fridley Creek Allotment, section 6 T6S, R7E of the Lewis Creek Allotment and parts of section 5 T6S, R7E, which is privately owned land (see Map 7). This allotment would encompass approximately 1,895 acres (approximately 1,495 acres National Forest/ 400 acres private) the entire allotment would be managed by the Forest Service. If the Adaptive Management Alternative were selected, then the acres for the Lewis Creek and Fridley Creek allotments, as described above, would change.

Most of the suitable range (approximately 1,245 acres) occurs at approximately 6,400 to 7,400 feet in elevation. The vegetation within this allotment is also very similar to that found in the Fridley Creek Allotment.

The upland areas are in good condition. The dominant upland rangeland habitat on this allotment is Douglas-fir/snowberry. This habitat type was only found in primary range and it covers 782 acres of the allotment (see Table A-4, p. A-4). This totals 842 acres of primary range, 291 acres of secondary range, 185 acres of transitory primary range and no transitory secondary range. Analysis for upland vegetation can be found in other issues Appendix A, pp. A-1 through A-11.

Riparian areas are in good condition. Livestock impacts are negligible to low. The dominant riparian habitat for Hyalite Creek is mountain alder/red osier dogwood. This habitat type has a high inherent stability. Dry Creek consists of Douglas-fir/red osier dogwood, which also has a relatively high inherent stability. These streams are either inaccessible or have little impacts allowing for them to have a desirable habitat. The main streams in this allotment are Hyalite and Dry Creek. There are presently no water developments on this allotment.

Some noxious weeds inhabit this allotment. The dominant weeds presently found on the allotment are St. Johnswort, hounds tongue and Canada thistle. The largest infestations are found along roadways and on the southwest aspects. The noxious weeds will continue to be monitored and eradicated when possible in conjunction with the permittee.

B. Aspen

Significant issue # 3 pertains to the long-term effect that livestock grazing is having on aspen stands (and subsequently migratory birds) that occur in the Fridley Allotment. Aspen, a deciduous tree contributes to ecological diversity and supports a variety of plant associations. According to Campbell and Bartos (2001), Johnson (2005), and Kay (1997), aspen stands are, with the exception of riparian areas, considered the most biologically diverse ecosystem in the Intermountain West. Ripple and Larsen (in press) state that aspen decline has been observed throughout the western United States and on Yellowstone's northern range since the 1920's. They acknowledge the ongoing debate on the cause of this decline being ungulate (elk) browsing, climate fluctuations, and fire suppression. As aspen dominated landscapes covert to other cover types, tremendous biodiversity is lost.

Aspen stands provide important habitat for many species of wildlife (DeByle 1985b, Johnson 2005). Aspen provides forage, cover, shade, and nesting habitat for birds, small mammals, big game, and forest carnivores. Aspen stands provide forage and shade for both livestock and wildlife. The young aspen sprouts themselves are nutritious forage that can contribute to a large portion of both livestock and ungulate diets, particularly in the fall. Excessive grazing generally alters forage composition and reduces production (Mueggler 1985a).

Fridley Creek Allotment

In the Fridley Creek Allotment, the level of livestock grazing and trampling that has occurred within the aspen stands has depleted the amount and quality of forage available. In addition, suckers that sprout annually are browsed to a degree that they are not surviving, creating a decadent, single-storied stand of over-mature aspen.

Aspen provides habitat for many species of birds, some of which utilize the stand year-round while others use aspen during only a portion of the year (DeByle 1985b). Birds breeding in aspen stands include shrub or tree canopy nesters, cavity nesters, or ground nesters. Aspen trees offer more structural diversity than conifer forests (Johnson 2005). Snags provide perches for birds of prey and sites for cavity nesters. Bird communities vary with the size, age, and grazing history of aspen clones (Kay 1997).

Aspen clones in the Fridley Creek Allotment are at risk of loss on the landscape from conifer encroachment, absence of rejuvenating fire, and the current level of browsing and trampling. The stands are moving toward becoming single-storied with an over-mature canopy and little, if any, surviving reproduction. Conifers are encroaching throughout the stands and sharing dominance with aspen.

The aspen in the Fridley Creek Allotment is considered a seral community. The most valid indicator of a seral aspen community is the active replacement of the aspen overstory with more shade-tolerant conifers (Mueggler 1985b). Kay (1997) asserts that aspen is not a seral species since it does not seed on to the site after a disturbance. However, he does agree that since the aspen clone is already there, periodic disturbance stimulates vegetative regeneration via root suckering; the mere presence of long-lived aspen indicates a long history of past disturbance, primarily frequent fire.

Lewis Creek/Sunnybrook/Dry Creek Allotments: Although scattered individual aspen trees may be present in some of these allotments, aspen is not a key vegetative component within the Lewis Creek, Sunnybrook, and Proposed Dry Creek Allotments.

C. Water and Fish Habitat

Significant Issue #1 pertains to the negative effects that livestock grazing is having on some stream reaches and fisheries habitat within the allotments. The aquatic analysis area considered for the allotments is the downstream extent of where management actions directly or indirectly affect channel morphology, aquatic habitat or fish populations. For the Fridley, Lewis Sunnybrook and proposed Dry Creek Allotments, grazing effects are local, and do not extend beyond the allotment boundaries. Therefore, for aquatics, the analyses areas include the stream segments within the allotment boundaries.

The affected environment descriptions for the Fridley, Lewis, Sunnybrook and proposed Dry Creek grazing Allotments and effects analyses are based on field reviews of the streams within the allotments (see Maps 2-2 through 2-7 for stream locations within the individual allotments), including fish habitat and population surveys and other resource documentation. For this Environmental Assessment, aquatic issues warrant a detailed analysis and effects disclosure because of the presence of Yellowstone Cutthroat trout (YCT) in Fridley Creek and channel stability problems in Miller Creek.

The allotment streams have considerable variability in inherent sensitivity to disturbance, the role that riparian vegetation plays in maintaining their stability, and the ability to recover from grazing induced damage. Some stream or channel types are inherently very stable and not susceptible to grazing impacts, while other channel types can be significantly altered. Thus, it is important to understand the sensitivity of individual streams in order to evaluate past, present and future grazing affects on channel stability and fish habitat quality. The existing condition description for each stream described below and management interpretation of the various streams as outlined in Table 3-1 include a channel type and sensitivity analysis.

Likewise, depending on topography and vegetative patterns within the allotment, cattle may or may not use riparian corridors along various stream segments within the allotment. In some cases, the stream or stream reaches may be inaccessible due to steep topography. In others, the lack of suitable forage along stream reaches may avert cattle occupancy along riparian corridors. In other cases, the primary grazing areas may be within riparian corridors, or riparian corridors may be used as access routes to suitable rangeland

Table 3-1. Management interpretations of various stream types (from Rosgen 1996).

Stream	Stream Types	Sensitivity to Watershed Disturbance[a]	Recovery Potential[b]	Sediment Supply[c]	Streambank Erosion Potential	Vegetation Controlling Influence[d]
Fridley Allotment						
Fridley Cr	B3 B4	low moderate	excellent excellent	low moderate	low low	moderate moderate
S. Fk Miller Cr	A5 A4	very high extreme	very poor very poor	very high very high	very high very high	negligible negligible
N. Fk Miller Cr	F4	extreme	poor	very high	very high	moderate
Miller Cr	G4	extreme	very poor	very high	very high	high
Dry Cr	B3a	low	excellent	low	low	moderate
Golmeyer Cr	B4 C4 E4/5 E6	moderate very high very high very high	excellent good good good	moderate high moderate low	low very high high moderate	moderate very high very high low
Lewis Allotment						
Lewis Cr	B3a	low	excellent	low	low	Negligible to moderate
Mill Fork	B4	moderate	excellent	moderate	low	moderate
Hyalite Cr	A3	very high	very poor	very high	very high	negligible
Sunnybrook Allotment						
Hyalite Cr	A3	very high	very poor	very high	very high	negligible
Big Cr	B3	low	excellent	low	low	moderate

[a] Includes increases in streamflow magnitude and timing and/or sediment increases

[b] Assumes natural recovery once cause of instability is corrected

[c] Includes suspended and bedload from channel derived sources and/or from stream adjacent slopes.

[d] Vegetation that influences width/depth ratio stability

Determining Proper Functioning Condition

Allotment reviews were conducted in 1997 and 2004 to check the extent of riparian/channel stability impacts and conformance with the existing Forest Plan standards and guidelines. Stream channel stability was measured for certain stream reaches using the Pfankuch (1975) method which rates channel stability. This technique evaluates the upper banks, lower banks, and channel bottom and can be used to indirectly assess streambank damage resulting from cattle grazing. Because different stream types have inherently different channel stabilities,

the good, fair, and poor rating values using the Pfankuch (1975) method have been adjusted by stream type (see Rosgen 1996, page 6-29). In addition, the Proper Functioning Condition (PFC) evaluation procedure (Prichard, 1998) was used in 2004 for stream segments in Dry Creek and Miller Creek.

The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water and vegetation. A Proper Functioning Condition (PFC) evaluation is a qualitative method for assessing the condition of riparian-wetland areas that considers hydrology, vegetation, and erosion/deposition attributes processes. The method assesses how well these processes are functioning. The PFC technique evaluates these interacting natural forces to arrive at a "PFC" determination. PFC determinations were made for several streams throughout the allotment. Potential Natural Condition (PNC) defines nearly pristine conditions. If a riparian-wetland area is not in PNC or is not "properly functioning" (PFC), it is placed into one of three other categories:

- Funtional-At Risk – riparian-wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.
- Nonfunctional – Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows, and thus are not reducing erosion, improving water quality etc…
- Unkown – Riparian-wetland areas that managers lack sufficient information on to make any form of determination.

Pfankuch evaluations for Dry and Miller creeks were conducted at the same reaches as Proper Functioning Condition assessments and Rosgen classifications described above. PFC evaluations for other stream reaches were completed using existing file data, photos, personal observations and knowledge of streams in the project area.

Determining Desired Future Condition

The Gallatin Forest Plan includes a programmatic Desired Future Condition (DFC) statement related to Forest wide grazing. The DFC statement is "improved range management practices will be initiated to improve wildlife habitat in livestock grazing allotments on wildlife winter ranges and riparian areas (Forest Plan page II-12)." More site specific DFC's describe the riparian area that management is intended to produce. The DFC reflects the capability of the landscape, the various laws and regulations that apply to an area, and the values, or "products" that are desired. DFC's are portrayed through descriptions of how an area would look and function. The concept of proper functioning condition (PFC) of riparian areas has recently surfaced as guidance for the management of riparian areas on public lands and can be used to help describe the DFC of a particular riparian area. PFC entails maintaining the physical components of riparian areas in a fashion that dissipates stream energy, filters sediment, retains floodwaters, and develops root masses (BLM, 1993). In most cases the DFC for a stream or stream reach will fall somewhere between a minimum of PFC (Functional –At Risk, with an upward trend) and a maximum of Potential Natural Condition (PNC). Potential Natural Condition would reflect the streams full habitat potential. Desired future conditions also incorporate forest plan standards and guidelines relative to streambank

stability (i.e., meet all standards and guidelines), and fish habitat management guidelines found in Table 3-3.

Developing Use Levels

The process outlined here for determining and implementing allowable use levels for riparian areas has been successfully employed on the Beaverhead-Deerlodge National Forest as a way of reaching a DFC for a stream. There are four steps in the process to develop use levels for specific riparian areas:

1. Set Desired Future Condition (DFC)
2. Choose a Sensitivity Level
3. Determine the Inherent Stability
4. Assess parameters important to riparian function, determine a limiting parameter, and establish appropriate use levels.

Site-specific DFC descriptions first require setting a sensitivity level that is commensurate with specific stream attributes and values. Often, streams within a watershed, landscape, or administrative unit exhibit a variety of values. For example, streams that contain threatened, endangered or sensitive fish species, popular sport fisheries, municipal water supplies, etc. would be considered to have higher values than streams that do not have these attributes. Because of these variations, some streams receive special management emphasis to either protect important values or move a stream that is not at PFC in that direction. Some of the considerations that can enter into a sensitivity level determination are fisheries, soil sensitivity, stream type, recreation importance, etc. (see Bengeyfield and Svoboda, project file report). To aid in that effort, streams within the allotment were stratified by sensitivity level by the ID team using criteria established by Bengeyfield and Svoboda (Table 3-3). The sensitivity level is expressed as a percent of potential and is used to help determine acceptable levels of change (i.e., streambank alterations, changes vegetative communities). This determination gives a manager the option of maintaining a stream at from 75% to $\geq$90% of its potential. These management goals are consistent with Forest Plan implementation guidance described in Table 3-2, p. 3-15.

Determining the inherent stability of the stream reach in question is a process based on channel types, riparian vegetation, and the influence riparian vegetation has channel stability. Channel type and sensitivity analyses are combined with knowledge of vegetative community types and the relative influence riparian vegetation has on streambank stability to determine "inherent stability". Percent inherent stability figures based on vegetative community types are taken from Table 2 in Bengeyfield and Svoboda USFS report (Project File), and adjusted to accommodate for channel type and differences in species composition (see Table 3-2, p. 3-15). The inherent stability determination recognizes that channels are seldom 100% stable under pristine conditions. The determination equates to the amount of stable streambank that would exist in a functional state and provides a reference from which to set allowable bank stability goals. Bank stability goals, or "allowable levels of streambank alteration" are determined by multiplying the sensitivity level, expressed as a percent of potential, by the inherent stability, also expressed as a percentage. For example, Fridley Creek is a sensitivity level I stream because it supports a sensitive fish species (Class A

stream, see table 2). Fridley Creek would be managed at a level of at least 90% of its inherent potential. Fridley Creek has a stable channel type (e.g., B3/B4) with a riparian vegetative habitat type of alder and dogwood that exerts negligible influence on channel stability. The inherent stability rating given in Table 2 of Bengeyfield and Svoboda (USFS file report) shows a score of 100% for that habitat type. Thus, the sensitivity level (.9) is multiplied by the inherent stability score of (1) to determine the allowable level of bank alteration due to cattle grazing (.9 x 1.0 = 0.1). In this example 90 feet out of every 100 feet would have to be stable, so 10 feet could be altered. The DFC for bank stability and riparian use is designed to ensure Forest Plan standards are met (i.e., "manage riparian vegetation, including overstory tree cover, to maintain streambank stability and promote filtering of overland flows FP III-21)."

In addition, describing a DFC requires a description of how similar existing conditions are to the DFC. Assessing "similarity" to DFC provides a starting point from which success or trends can be measured. It is also necessary to determine which parameters are important to attain or maintain DFC. Once the critical parameters are determined, appropriate use levels for those parameters can be established. Critical parameters may be physical (i.e., allowable levels of streambank alteration), or they may have a vegetative component (i.e., stubble height, forage utilization, riparian shrub utilization). Depending on a streams inherent stability and the influence riparian vegetation has on channel stability, physical and/or vegetative parameters may play a more or less important role in achieving DFC. These physical or vegetative parameters then become a "limiting" parameter for a stream or a reach of stream. For example, allowable levels of streambank alteration may be a trigger point for moving cattle and may be initiated before allowable forage utilization levels are met. In this example, allowable levels of streambank alteration become the limiting factor and the most important component in moving a stream or stream reach toward DFC.

Table 3-2 Sensitivity levels, existing and desired similarities and desired habitat types by stream for each allotment.

Allotment	Stream	Sensitivity Level	Existing Community Type	Existing Similarity	Desired Similarity	Desired Habitat Type
Sunnybrook Allotment	Big Creek	II	Alnic/Corsto	High	High	Alnic/Corsto
	Lewis Creek	II	Alnic/Corsto	Moderate/ High	Moderate/ High	Alnic/Corsto
	Hyalite Creek	II	Alnic/Corsto	Moderate/ High	Moderate/ High	Alnic/Corsto
					Moderate/ High	Alnic/Corsto
Lewis Allotment	Lewis Creek	II	Alnic/Corsto	High	High	Alnic/Corsto
	Mill Fork Creek	II	Poapra	Moderate/Low	Moderate/ High	Psemen/Symalb
Dry Creek Allotment	Hyalite Creek	II	Alnic/Corsto	Moderate/ High	Moderate/ High	Alnic/Corsto
	Dry Creek	II	Alnic/Corsto	Moderate/ High	Moderate/ High	Psemen/Symalb
	Unnamed Creek	II	Alnic/Corsto	Moderate/ High	Moderate/ High	Alnic/Corsto
Fridley Allotment	Fridley Creek	I	Alnic/Corsto	High	High	Alnic/Corsto
	Miller Creek	II	Alnic/Corsto	Moderate/ High	Moderate/ High	Alnic/Corsto
	Upper Miller Creek	II	Poapra	Moderate/Low	Moderate	Salix spp.
	N.F. Miller Creek	II	Poapra	Moderate/Low	Moderate	Salix spp
	S.F. Miller Creek	II	Poapra	Moderate/Low	Moderate	Salix spp
	Golmeyer Creek	II	Carex spp.	Moderate/ High	Moderate/ High	Salix spp
	Unnamed Trib.	II	Poapra	Moderate/Low	Moderate/ High	Carex spp.

[A] Alnic refers to Alder species, [B] Corsto refers to Dogwood species, [C] Poapra refers to bluegrass species, [D] Carex refers to sedge

Fridley Allotment

The Fridley Allotment analysis area includes approximately 3 miles of Fridley Creek, Dry Creek, Miller Creek, the extreme headwater reaches of Golmeyer Creek, and other unnamed ephemeral draws (Maps 2 & 3). None of the smaller tributaries or ephemeral draws support fish populations within the allotment boundaries.

Channel Type, Stability, and Habitat Descriptions:

***Fridley Creek**:* Within the allotment, Fridley Creek flows through sections 26, 27, 28 and 1/8 mile of section 20. No suitable rangeland exists in Sections 20 or 28 and no grazing occurs along Fridley Creek in those sections. Grazing does occur along the riparian corridor in sections 26 and 27. In those sections, the stream flows through moderate to steep topography; it is moderately entrenched with a moderate gradient and has a very stable plan and profile. It is riffle dominated with frequently spaced pools formed by large woody debris. The channel is characterized as predominately a B3 (cobble dominated) and B4 (gravel dominated) channel with short B2 (boulder dominated) reaches interspersed throughout. Some short (e.g., <100 ft.) higher gradient (>4% slope) segments exist and are considered B3a channels. All channel types are inherently stable with a low sensitivity to changes in streamflow or sediment discharge (Table 1; Rosgen 1994). They have a low to moderate sediment supply, low streambank erosion potential, and negligible to moderate riparian vegetation controlling influence (see Table 1). However, under certain conditions, B3 and B4 type channels can have a moderate to high sensitivity to grazing impact depending on riparian vegetation composition, soil type, bank angle and rock content (Rosgen 1994). Cattle concentrations and season of use also determine severity of potential grazing impacts for B3 and B4 channels. Riparian vegetation along the stream corridor consists of dense conifers with mostly native understory shrubs and grasses. Banks are well vegetated with dense root masses. They are very stable with a high rock content and little evidence of erosion. With the exception of infrequently spaced meander bends with a high bank angle, most banks have a relatively low bank angle with high erosional resistance. Some bank erosion does occur near debris jams where the stream is being naturally rerouted, and at trail crossings. Story (1997) determined that bank stability in Fridley Creek within the allotment was in compliance with Forest Plan standards. Two monitoring sites showed no reductions from natural bank stability using the Pfankuch rating method. Although no Potential Natural Condition (PFC) evaluation has been performed, based on channel stability data, habitat data, photo interpretation and visual observation, the stream is at or near (PFC) and meets the narrative standards for MA7 (see Relationship to Forest Plan).

Habitat surveys of Fridley Creek within the allotment were completed during the summer of 1995. Survey results for all reaches measured within the allotment show that pool habitats comprised approximately 22 % of the total stream area surveyed and the majority (17%) were formed by boulders and later scour. The remaining 4.5% were formed by large wood in the channel. Pools formed by large woody debris (LWD) are often the highest quality pools because of the diversity and complexity of habitat created. Riparian harvest on some privately owned sections occurred in the 1930's and 1940's, but overall

LWD recruitment to the channel appears sufficient for moderate numbers of high quality pools to exist. The frequency of LWD averaged 209 pieces and/or aggregrate per mile or 13 per 100 meters throughout. In-stream debris frequencies were the same for the survey reach upstream of the allotment where no riparian harvest has occurred. Maximum pool depths and mean residual pool volume are consistent with other undeveloped or minimally developed B3 and B4 streams on the Gallatin National Forest. Fine sediment concentrations measured in 1991 in suitable spawning gravels above the Miller Creek confluence averaged 22.3% (n=8; range 9.8 - 32.2). This level of substrate sediment is consistent with drainages having minor levels of development on the Gallatin National Forest (e.g. road building and timber harvest). Thus, spawning habitat quality is considered good, and quantity or availability is sufficient for the number of adult fish the stream supports.

Miller Creek is a small second order tributary to Fridley Creek that flows primarily through privately owned sections 23 and 25. Some suitable rangeland exists along the stream in section 25. The stream has been heavily impacted by an adjacent road, grazing, riparian and upland timber harvesting on private lands and by the Fridley Fire. Although headwater reaches of Miller Creek maintain year-round streamflows, lower reaches of main Miller Creek have intermittent stream flow, likely due to subsurface percolation. Miller Creek proper is considered a G4 channel type which is entrenched with a low width/depth ratio and no floodplain access. The channel has predominately sand and gravel substrate, is extreme sensitivity to disturbance, has a very poor recovery potential, very high sediment supply, very high streambank erosion potential and high vegetation controlling influence (Table 3-1, p. 3-11). The existing G4 channel is in an altered state that reflects the effects of riparian harvest, channelization, and overuse by cattle. Prior to road construction the channel was likely a B4 channel type. A 1997 monitoring review showed the stability rating was 34 points above natural stability (higher score = less stability) which exceeds the Forest Plan guideline of a 20 point increase limitation (Story 1997). The sediment filtration function standard was also exceeded. In 2004 a review of the same section in Miller Creek found that the channel type had further incised due to increased Miller Creek runoff from the Fridley fire. Most of the downcutting occurred in July of 2002, the year after the fire. Channel stability was rated at 130 or poor which was estimated to be 38 points above reference condition. Miller Creek was rated as "non-functioning" using the PFC assessment process (Prichard, 1998). The degraded condition in 2004 is attritributable to a combination of Fridley fire runoff scouring effects and continued heavy riparian livestock grazing. Grazing impacts throughout the lower most reach of Miller Creek within the allotment (i.e., the last ¼ mile reach in section 25) are less pronounced. Riparian vegetation, which consists of alder and dogwood, reflects a community type more consistent with natural conditions.

The South Fork of Miller Creek is a small 1st order tributary to Miller Creek with no fishery potential. The channel is an A3/A4 type, which has a very high sensitivity to disturbance, very poor recovery potential, very high sediment supply, and very high streambank erosion potential. Riparian vegetation typically exerts negligible controlling influence on channel stability. A stream segment surveyed in August 1997 in section 23 had extensive riparian harvest and overstory removal, which reduced debris recruitment potential and thus, channel stability. Most channel stability reductions were due to

previous riparian harvest and reductions were not related to grazing. Grazing impacts were moderate compared with downstream reaches. However, in 1997, the reach did meet FP guidelines for channel stability and sediment filtration. A review of the same site on the South Fork in 2004 indicated that the Fridley Fire effects of increased stormflows in 2002 and sediment yields had downcut part of the South Fork with a small debris deposit near the confluence with the North Fork. Channel type in sections of the South Fork changed to an A5 (sand substrate dominated) due to increased sediment. This section was rated as 24 points above reference condition due primarily to the Fridley fire scouring and deposition. The PFC was rated as "non-functional" due to the channel fire effects.

The North Fork of Miller Creek is also a small tributary stream with no fishery potential. Timber harvest has created areas of suitable rangeland and some riparian use does occur. The tributary more closely approximates an F4 stream type, which has an extreme sensitivity to disturbance, poor recovery potential, very high sediment supply and very high streambank erosion potential (Table 3-1, p. 3-11). Riparian vegetation exerts moderate control on channel stability for F4 stream types. The August 1997 review showed that current grazing impacts in this stream are low but the channel has been heavily impacted by clearcutting of the riparian area with extensive channel disturbance and resulting cutting and deposition. The segment surveyed did not meet the Forest Plan stream channel stability guidelines. Stability reductions were primarily related to riparian harvest. The F4 channel type likely represents an altered state. Prior to riparian harvest, the channel likely was a more stable B or C type. This section was surveyed again in 2004 with similar results to 1997. Channel stability score was 28 points higher than natural due to the historical logging, Fridley fire, and some localized livestock bank trampling. The PFC was rated as "functioning at risk" due primarily to the historical logging and Fridley fire channel scour/deposition effects.

Golmeyer Creek is an ephemeral first order tributary to the Yellowstone River flowing through NF section 4 and private section 33. Suitable range exists along the entire reach of stream within the allotment. Based on surveys completed in July 1999 throughout FS section 4, channel type varies between B4, C4, and E4, E5, and E6 depending on valley gradient, confinement and predominate substrate. Channel stability scores and survey notes suggest that past riparian harvest has influenced bank stability, large woody debris frequencies and substrate distribution, with an increase in fine sediment. However, banks were well vegetated and grazing related impacts were minor. Overall stability scores were 94 (rating of fair) and 100 (rating of poor) for two respective reaches. Geomorphic categories that resulted in reduced ratings were not related to grazing impacts and the forest plan standard of no more than 20-point departure is met. Channel stability data were collected in reaches with "E" channel types, which are the most sensitive to grazing impacts. Notes also suggest that utilization of riparian vegetation has been minimal. Although a PFC rating was not performed, based on photo interpretation a rating would likely be "Functioning at Risk" with an upward trend, with impacts primarily associated with historic riparian logging.

Dry Creek is a small perennial second order tributary to the Yellowstone River that flows through sections 29 (pvt), 30, 31 (pvt), 32 and 4. Suitable rangeland exists throughout several reaches of stream. In June 1999, three reaches of stream were surveyed, one reach in FS section 4 and two reaches in FS section 32. Channel types were B3 in section 4, C3 in the southeast corner of section 32, and an A3 channel type in the northwest quarter of section 32. Channel stability ratings were fair to good. Notes and photos taken during the survey suggest that cattle grazing have had little to no impact on channel form and function. A 2004 review of Dry Creek in Section 4 (on National Forest) typed the stream segment near the lower Forest Boundary as a B3a channel type which has low sensitivity to disturbance, excellent recovery potential, low sediment supply, low streambank erosion potential and moderate vegetation controlling influence. Channel stability was rated at 53 (rating = good), which was judged to be 4 points above reference condition due to some limited lower streambank cutting. The PFC was rated as "functional" and the stream judged to be well within Gallatin FP channel stability and riparian filtration guidelines.

Unnamed tributary. There is an unnamed perennial first order tributary in section 34 of the Fridley Creek allotment on National Forest. Photographs of a meadow area adjacent to a spring fed water tank show high utilization and significant ground disturbance. Streamflows are too low to support a fishery. Channel type and PFC data has not been collected for the unnamed tributary; however, based on photo interpretation, the stream in the meadow reach would be rated as "non-functional" due to the severity of vegetation and soil impacts.

Fish Populations

Table 3-3 outlines the Gallatin National Forest classification scheme for fisheries and management objectives by stream type.

Table 3-3. GNF management classification scheme and objectives for allotment streams

Stream Class	Class Description	Allotment Streams	Management Objective
A	**Streams with *Sensitive sp.p* or Blue Ribbon Fisheries**	**Fridley Cr. (above the incised canyon)**	**90% (of pristine)**
B	**Streams with regional or local importance as a fishery**	**Big Cr., Lewis Cr., Hyalite Cr., Miller Cr., Golmeyer Cr., Dry Cr., Mill Fk Cr., and Fridley Cr. below the incised canyon.**	**75% (of pristine)**

Fridley Creek: An electro-fishing survey was completed in Fridley Creek during summer 1991. Survey results verified that Yellowstone cutthroat trout (YCT) exist upstream of the high gradient incised canyon reach in the northwest corner of section 36 above the Miller Creek confluence. Apparently the high gradient nature of the channel in the canyon, combined with a series of low elevation cascades and falls have impeded upstream migration of non-native salmonids. This has resulted in an isolated population of genetically pure Yellowstone cutthroat trout above the canyon (validated via electrophoretic analysis, 1991). Although statistical estimates of YCT densities have not been performed, electrofishing surveys show that moderate numbers of YCT inhabit the upper reach with several year classes represented. No other trout species were found above the canyon during the survey.

YCT are considered a *Species of Special Concern* by the Montana Department of Fish, Wildlife, and Parks and a *Sensitive Species* by the Forest Service. This is because the current geographic distribution of "genetically pure" YCT encompasses less than 10% of their historic range. There are 36 remaining populations throughout their entire historic geographic range, most of which are isolated with little potential for genetic exchange, which contributes to their decline. Like most others, the Fridley Creek population is geographically isolated. Other causes for decline throughout their historic range include competition and hybridization with introduced non-native salmonids. According to Montana Department of Fish, Wildlife and Parks historic fish stocking records, brown trout and cutthroat trout of unknown origin have been stocked in Fridley Creek. Other reasons for YCT decline throughout their historic range include habitat degradation, and population fragmentation.

Miller, Golmeyer, and Dry Creeks and the unnamed tributary*:* Because of low and intermittent streamflows, Miller Creek and its tributaries, and Golmeyer Creek, do not support fisheries. Although streamflows in Dry Creek appear sufficient, fish do not inhabit the stream. Electrofishing surveys completed in August 1999 verified the absence of fish in all three streams. Watershed direction associated with water quality and maintenance of channel integrity guides management of fishless streams. Low streamflows also prohibit fish from inhabiting the unnamed tributary stream in Section 34 of the Fridley allotment.

Lewis Allotment

The Lewis Allotment analysis area currently includes a 1.5 mile reach of Lewis Creek, headwater reaches of Hyalite Creek, which are both tributaries to Big Creek, and a .5 mile reach of Mill Fork Creek which is a tributary to Hyalite Creek (Maps 4 & 5).

Channel Type and Habitat Descriptions

Lewis Creek is a second order tributary to Big Creek and delineates the southwest boundary of the allotment in section 12. The stream is confined by a steep, tertiary volcanic bedrock canyon, which precludes cattle access to the stream. No suitable

rangeland exists along the riparian corridor of Lewis Creek. The channel is a moderately entrenched, high gradient B3a channel type that is inherently stable with a low sensitivity to changes in streamflow or sediment discharge (Table 1; Rosgen 1994). They have a low to moderate sediment supply, low streambank erosion potential, and negligible to moderate riparian vegetation controlling influence (see Table 1). Riparian vegetation exerts negligible influence on bank stability. Some reaches of Lewis Creek were heavily impacted by record snowmelt/stormflow runoff during June 1997. Several sections observed during a field review in August 1997 were severely downcut with associated lateral depositional bars. No evidence of cattle use was observed because topography precludes access. Channel stability was rated natural, because anthropogenic disturbance has not caused instability. Fish habitat survey information collected during summer of 1996 demonstrates that habitat conditions are typical for high gradient B3a streams. Most pools are formed near boulders or large woody debris in the channel. Although a PFC rating was not performed, based on photo interpretation and channel type data, a rating would likely be "Functioning".

Mill Fork Creek is a small first order tributary to Hyalite Creek in the extreme southwest corner of Section 6. Approximately 1/8 mile of stream is within the allotment, all of which is located within suitable range. The stream just above the lower allotment boundary is classified as a B4 channel type. In the reach above the lower allotment boundary (between National Forest in section 12 and private land in section 1) cattle were confined by the allotment fence and concentrated in the riparian area. High cattle concentration resulted in bank trampling with channel stability scores exceeding FP guidelines based on a survey conducted by Story (1997). Trampling also resulted in more than a 25% loss in streambank cover for an area about 200 feet long, which also exceeds the MA7 requirements to promote filtering of overland flow. Another channel stability survey was conducted in July 1999 with similar results reported. The 1999 survey also reported a high percent of fine sediment. This stream section has not been grazed during the last 3 years and has recovered from grazing related impacts. A PFC evaluation has not been conducted for the previously impacted reach. However, based on photo interpretation, and surveys conducted in 1997 and 1999, the reach would likely have been categorized as "functioning at risk." Currently, the stream is categorized as "functioning at risk with an upward trend."

Hyalite Creek within the Lewis Allotment is a small first order stream flowing through section 6. Suitable range is not delineated along the riparian corridor. The stream is an A3/A4 channel type that has a very high sensitivity to disturbance but negligible vegetation controlling influence. No evidence of riparian grazing was observed during an August 1997 field review (Story 1997) or in a survey conducted in 1999. However, flood flows in 1997 caused extensive destabilization from downcutting, lateral cutting, and bedload deposition. Because those disturbances were from natural causes, they were judged to be within FP guidelines. Channel stability data collected in 1999 showed a Pfankuch rating of "good". Riparian vegetation is extremely dense, and cattle access to the stream is limited. Grazing has not impacted the stream. A PFC evaluation has not been conducted for the stream, however, based on photo interpretation, and surveys conducted in 1997 and 1999, the reach would likely be categorized as fully functional.

Fish Populations

Lewis Creek. Fish population surveys were conducted in 1992 in Lewis Creek to validate the absence of pure Yellowstone cutthroat trout. An electrofishing survey was completed in sections 12 and 2. Rainbow trout and hybridized cutthroat trout were found in moderate numbers. Cutthroat trout with the phenotypic expressions of a pure strain were not found. Thus, Lewis Creek is managed as a Class B stream.

Mill Fork Creek has sufficient perennial streamflow to support a small fish population with minimal recreational value. Population surveys were conducted in 1992 in various reaches of Hyalite and Mill Fork creeks to validate the absence of pure Yellowstone cutthroat trout. A few rainbow and hybridized cutthroat trout were found but no YCT. Mill Fork Creek is considered a Class B stream (Table 3-3, p. 3-19).

Hyalite Creek in section 6 of the Lewis Allotment maintains sufficient streamflow to support a limited trout population. Electrofishing surveys completed in 1992 showed that a small polulation of rainbow trout and hybridized cutthroat trout inhabit the stream. Pure YCT do not inhabit the stream. Therefore, Hyalite Creek is managed as a Class B stream (Table 3-3, p. 3-19).

Sunnybrook Allotment

The Sunnybrook Allotment analysis area includes a lower reach of Hyalite Creek, and a one-half mile reach of Big Creek (Map 6).

Channel Type and Habitat Descriptions

Big Creek is a large third order tributary to the Yellowstone River flowing through Section 18 of the allotment. No suitable range has been identified along Big Creek and limited riparian grazing occurs because steep topography precludes livestock access to the stream. The stream is characterized as a B2/B3 channel with predominately boulder and cobble substrate. Those channels typically have a low to very low sensitivity to disturbance, excellent recovery potential, very low sediment supply, and low streambank erosion potential and moderate vegetation controlling influence. Riparian vegetation exerts negligible influence on bank stability. A PFC evaluation has not been conducted for the stream, however, based on photo interpretation, and personal observation the reach would likely be categorized as fully functional.

Hyalite Creek within the Sunnybrook Allotment is a small second order stream in section 18. Suitable range exists along the entire stream reach in the allotment. However, no evidence of riparian grazing was observed during an August 1997 field review (Story 1997), primarily because of the dense deciduous shrubs that avert stream access. The stream has an A3 channel type that has a very high sensitivity to disturbance but negligible vegetation controlling influence. Flood flows in June of 1997 caused extensive destabilization from down cutting, lateral cutting, and bed load deposition.

Because those disturbances were from natural causes, they were judged to be within FP guidelines.

Fish Populations

Big Creek. Population surveys were conducted in 1987 in lower reaches of Big Creek within National Forest boundaries to determine species composition and relative abundance. Rainbow trout and hybrid cutthroat trout were found. Cutthroat trout samples were tested for genetic purity in 1987 and all were severely hybridized. Additional surveys were completed in headwater streams in 1992 to determine whether an isolated population of YCT existed, but none were found. Big Creek does however support moderate numbers of rainbow and hybrid cutthroat trout and is considered to have regional and local significance as a fishery. It is managed as a Class B stream.

Hyalite Creek in section 18 of the Sunnybrook Allotment maintains sufficient stream flow to support a limited trout population. Electro fishing surveys completed in 1992 showed that a small population of rainbow trout and hybridized cutthroat trout inhabit the stream. Pure YCT were not found. Therefore, Hyalite Creek is considered a Class B stream (Table 3-3, p. 3-19).

Dry Creek Allotment

The Dry Creek allotment would be created under alternative 3. The reach of Hyalite Creek within the Lewis Allotment, and the reach of Dry Creek within the Fridley allotment, both described above, would be within the newly formed Dry Creek allotment under Alternative 3 (Map 7).

D. Migratory Birds

Significant issues # 1, 2, & 3 pertain to the effects that livestock grazing are having on habitat that is important to various species of migratory birds. The Migratory Bird Treaty Act requires federal agencies to ensure that environmental analyses of federal actions evaluate the effects of actions and agency plans on migratory birds. Migratory birds are a diverse group including raptors, waterfowl, shore birds, game birds, and songbirds. Migratory bird species are analyzed as an indicator species for grassland, shrub/ steppe, riparian, and aspen habitats. There are currently no Forest Plan standards specific to migratory birds. Habitats found in the analysis area are grasslands, shrub-steppe, conifer forest, riparian, and aspen.

Grassland, shrubland, and coniferous habitat is not limiting within the project area. Many species of wildlife depend upon, or use only infrequently, grassland, shrubland, and conifer forest habitats. Some migratory songbird species respond negatively to grazing, some positively, and many not at all. Grasslands and upland shrublands within the project area are in good condition. There would be little if any change in these habitats with the implementation of any of the action alternatives. There were no key issues related to these habitats.

The emphases for analysis of migratory birds are those habitats associated with the key issues of stream functionality, vegetation composition of spring sources (riparian), and aspen health (aspen). Additional information can be found in the updated (April 2005) issue paper on Livestock Grazing and Migratory Birds located in the project file.

E. Wildlife

The project area impacted by livestock grazing is comprised of a variety of habitat including lower elevation Douglas fir forest, open grassland and meadows, sagebrush shrublands, aspen, riparian, and high elevation lodgepole and/ or spruce/ fir forest. The Fridley, Lewis, and Sunnybrook allotments provide habitat on both private and public lands for a wide array of wildlife species including raptors, songbirds, small mammals, forest carnivores, and big game animals. Other than the effects to riparian and aspen habitats and what this means to migratory birds, there were no significant wildlife issues.

While it was determined that there were no other significant wildlife issues, there are laws, policies, and direction applicable to wildlife habitat considerations relative to resource management on National Forest lands. This regulatory framework considers species designated as threatened, endangered, or sensitive and management indicator species. Those species listed as threatened and endangered (grizzly bear, gray wolf, bald eagle, and Canada lynx) will be analyzed in the BA with a summary in Appendix A, pp. A-19 through A-24. Other species addressed in , Appendix A include sensitive species (peregrine falcon, flammulated owl, trumpeter swan, harlequin duck, wolverine, Townsend's big-eared bat, Northern goshawk, black-backed woodpecker, Yellowstone cutthroat trout, boreal toad, and leopard frog), and management indicator species (elk, pine marten) relative to the relationship of livestock grazing.

IV. Effects Analysis

1. Livestock May Be Impacting Stream Function And Fisheries Habitat.

Livestock use of riparian areas, including altering vegetative conditions and trampling streambanks, may result in bank and channel stability problems, increased sediment, and undesirable changes in stream channel form and function. For streams that support fish, these changes can result in degraded fish habitat and population declines.

Grazing management methods designed primarily for upland areas have altered stream characteristics in some stream reaches. Poor grazing management practices may cause direct mechanical damage (i.e., trampling streambanks) that changes the dimensions, pattern, and stability of alluvial channels. Improper grazing can also change the vegetative composition of riparian communities, and in so doing, also changes rooting depth, rooting character, surface protection, bank stability and aquatic habitat.

Measurement Indicator: Stream habitat and fish population measurements and observations; channel type and sensitivity analysis; existing versus anticipated bank and channel stability by alternative; and existing versus anticipated riparian use by alternative. Potential to meet DFC as described below by alternative.

Direct and Indirect Effects:

Alternative 1: No Action/No Grazing

Fridley/ Lewis Creek/Sunnybrook Allotments:

Alternative 1 would discontinue the term grazing permits in each allotment and eliminate the need for future maintenance of structural improvements on National Forest land.

Implementation of Alternative 1, the No Grazing Alternative, would eliminate all future potential for direct or indirect grazing related affects to currently or potentially impacted reaches of streams within the analysis area on National Forest land; however, the permittees may continue to graze livestock on adjacent private land. If this alternative were selected, the permittee would likely fence the Forest Service boundary and continue to graze. Because existing grazing management does not affect Yellowstone cutthroat trout in Fridley Creek, eliminating grazing would result in *"no impact"* to YCT inhabiting the stream.

Streambank stability and water quality/sedimentation would likely achieve near pristine reference conditions on the National Forest stream segments over time. The desired future condition of all stream segments throughout the allotments, as described in Appendix B, would be achieved. All Forest Plan standards and guidelines relative to grazing impacts on National Forest lands within the allotments would eventually be met.

Alternative Two: Proposed Action-Current Management

Fridley Allotment

Under Alternative 2, permitted livestock grazing would continue under the current management systems. Impacts to riparian vegetation from cattle are currently within Forest Plan standards and guidelines for the majority of this allotment, however, riparian areas along some stream reaches have been negatively affected. A continued downward trend in the riparian vegetation along these affected stream reaches would be expected with this alternative. Stream specific effects resulting from the existing grazing strategy are described in detail throughout the affected environment narrative, presented earlier in this chapter.

Effects to the affected stream reaches are detailed below:

Fridley Creek*:* Based on habitat surveys, bank stability data, stream channel sensitivity analysis, and field reviews, the existing grazing management strategy (Alternative 2) within the Fridley Allotment has had minimal impact on streambank or channel stability, channel form and function and overall habitat quality for Yellowstone cutthroat trout in Fridley Creek. Existing habitat conditions exceed 90% of the streams inherent habitat capability within the allotment boundaries. As such, habitat conditions in Fridley Creek meet Forest Plan Implementation guidelines for habitat quality (Trout Unlimited Settlement Agreement to the GNF Land and Resource Management Plan). Continued grazing under the current management strategy would result in "*no impact*" to the

Yellowstone cutthroat trout population in Fridley Creek, or the habitat that population is dependent upon. DFCs established for the stream would continue to be met.

***Miller Creek**:* Based on field reviews and bank stability data, the lower privately owned reaches of Miller Creek, where cattle are confined to the road corridor, exceed Forest Plan guidelines for bank stability. The combined effect of road construction, channelization, heavy cattle utilization, and channel scour from the Fridley fire has significantly reduced bank and channel stability. Under pristine conditions, low and intermittent streamflow would preclude fish from inhabiting the stream. Thus, there are no direct effects to fish or fish habitat. Because of the increased erosion and sedimentation from unstable banks in Miller Creek, sediment delivery to downstream reaches of Fridley Creek below the allotment boundary could be contributing to reduced habitat quality. A continuation of current management (Alternative 2) would perpetuate livestock concentration and associated problems with channel instability in Miller Creek. The existing G4 channel type is currently in an altered state that reflects the cumulative effects of riparian harvest, channelization, and overuse by cattle. Prior to those disturbances, the stream reach was likely a B4 channel type. Miller Creek is currently rated as "non-functioning" using the PFC assessment process. Under current management strategies, DFC's for Miller Creek proper would not be met. Appendix B, p.B-5 includes a detailed description of land use effects. DFCs for Miller Creek proper would not be met. Grazing is currently not influencing the lower ¼ mile reach of stream and DFCs are being met.

***South Fork Miller Creek**:* Based on habitat surveys, bank stability data, stream channel sensitivity analysis, and field reviews, grazing has had moderate impacts on bank stability, and channel form and function. Reviews indicate that riparian logging and post-fire runoff has influenced channel stability more than grazing. The stream currently does not meet Forest Plan guidelines for bank stability, primarily because of post-fire effects and previous riparian logging. Riparian logging and post-fire runoff has increased sediment levels in the stream. Grazing has reduced riparian shrub density. Recovery from an A5 channel type, with predominately sand substrates, to an A4 channel type with predominately gravel substrates, will likely occur under the existing grazing management (Alternative 2), but the rate of recovery would be slow because of the lack of riparian shrubs. Existing grazing management would continue to suppress shrub growth. The DFC for the stream, which includes a higher density of riparian shrubs, would likely not be attained.

***North Fork Miller Creek**:* Grazing has had low to moderate impacts on bank stability, and channel form and function. Reviews indicate that riparian logging and post-fire effects have influenced channel stability more than grazing. However, shrub utilization, and some localized bank trampling by cattle has reduced willow densities and bank stability along some reaches. The potential community type includes a higher density of willows. Under the existing grazing management (Alternative 2), high shrub utilization would continue to suppress willow growth. The DFC of channel recovery from an F4 channel type to a C channel type would not occur with existing shrub utilization and streambank alteration from cattle.

Golmeyer Creek: For Golmeyer Creek, the existing grazing strategy has had minor impacts on riparian vegetation, bank stability, and channel form and function and that the existing channel type likely represents an unaltered state. Surveys conducted in 1999 show that banks are well vegetated and utilization rates are low, even in the more sensitive reaches of the stream. However, some reduction in willow density has occurred. Impacts to the stream are primarily associated with historic riparian logging. The potential community would have both sedge and a higher density of willows. Under existing management (Alternative 2), Forest Plan standards would continue to be met; however, the DFC for increased willow density may not be achieved.

Unnamed tributary to Golmeyer Creek*:* For the unnamed tributary, high forage utilization rates and streambank trampling has converted an E4/E5 channel type to a C5 channel type. E4/5 channels are dependent on a healthy riparian community. The stream in the meadow reach is rated as "non-functional" due to the severity of vegetation and soil impacts. Grazing under the current management strategy (Alternative 2) would continue to exceed forest plan utilization, streambank stability, and filtration standards. The DFC for the stream would not be attained.

Dry Creek*:* Cattle grazing has had little to no impact on channel form and function in Dry Creek. The PFC was rated as "functional" and the stream judged to be well within Gallatin NF channel stability and riparian filtration guidelines. The existing and potential community types for the stream are alder and dogwood ((ALNIC/CORSTO). Under existing grazing management (Alternative 2), standards and DFCs would continue to be met.

Lewis Allotment

With Alternative 2, grazing would be reauthorized. This allotment would be grazed in a two-pasture deferred rotation. Timing, duration and intensity of grazing would be controlled.

Lewis Creek: Because topography precludes cattle access to Lewis Creek, there is no potential for cattle related effects in that stream with any of the alternatives.

Mill Fork Creek*:* Cattle related effects to Mill Fork Creek are limited to an approximate 200 feet reach where cattle are concentrated in the riparian area. In this reach, trampling of streambanks by cattle has caused channel instability problems and some local habitat degradation in the past. Except for the aforementioned reach, no other riparian, bank, or channel degradation occurs in Mill Fork Creek. This area was not grazed in 2003 and 2004 and is recovering. It is expected that pre-2003 degradation problems associated with cattle trampling would re-occur and the DFC would not be met in this reach.

Hyalite Creek (Section 6): Based on stream surveys, stream channel sensitivity analysis, and field reviews, grazing has had no impact on streambank or channel stability, or channel form and function in Hyalite Creek in Section 6. Although flood flows during spring 1997 caused channel aggradations and degradation, those disturbances are considered natural. Thus, existing habitat conditions, including channel and bank

stability, meet FP guidelines. No evidence of riparian grazing was observed during a field review in 1997 because extremely dense deciduous shrubs avert cattle access to the stream. The stream would continue to meet forest plan standards and guidelines relative to bank stability and sediment filtration.

Sunnybrook Allotment

Under Alternative 2, permitted livestock grazing would continue under the current management system. Timing, duration and intensity of grazing would be controlled. This allotment would be grazed in conjunction with an NRCS grazing plan (See p. 1-7).

Big Creek: Topography precludes grazing along the Big Creek riparian corridor; so there is no potential for vegetative utilization, bank trampling, or associated effects along Big Creek. The stream would continue to meet Forest Plan standards and guidelines.

Hyalite Creek (Section 18): Thick deciduous riparian vegetation limits livestock access to Hyalite Creek to a few trail crossings. Thus, the potential for riparian, bank or stream channel degradation is minimal. Except for trail crossings, existing conditions are near pristine. Continued grazing under the current management strategy (Alternative 2) would result in no effect to bank stability, channel form and function and fish habitat quality.

Alternative 3: Adaptive Management

Under Alternative 3, livestock grazing would be permitted under management systems designed to meet Forest Plan standards and guidelines focusing on end results. End results are described in terms of "Desired Future Conditions". A series of Adaptive Management practices are prescribed in order to meet DFCs. Detailed DFCs for individual streams and adjacent riparian areas within each allotment can be found in Appendix B. The management changes associated with Alternative 3 would be expected to reduce livestock grazing impacts to channel stability along the affected stream reaches in order to meet Forest Plan standards, guidelines and DFCs.

Fridley Creek Allotment

A desired future condition to be achieved is to return Miller Creek to a proper functioning condition. Alternative 3 (Adaptive Management) on p. 2-7 has the objective of reducing the heavy utilization and trampling that has been occurring along an approximately 1-mile reach of Miller Creek, Section 34. Alternative 3, through cooperative efforts on National Forest land and private land, would greatly reduce channel stability and stream form and functionality problems in the affected reaches of Miller Creek and address concerns in the unnamed tributary to Golmeyer Creek. Effects of implementation of Alternative 3 would be similar to Alternative 1, but would likely require a longer period of time for recovery. The effectiveness of Alternative 3 on the private land stream corridor also depends largely on the cooperation of the permittee. Dry Creek livestock grazing effects are expected to remain largely the same for all the alternatives and would have acceptable conditions.

Alternative 3 limits grazing in riparian areas along Fridley Creek to 25-45% forage utilization, 2-4" stubble height and 0-10 % woody utilization (in certain riparian areas). The

other riparian areas within this allotment would also be monitored to ensure that DFC is being met. These utilization standards would be used as a monitoring tool to be measured periodically to determine management effectiveness. Refer to Appendix B for site specific utilization numbers for all stream reaches within the allotments.

The reduction in livestock impacts (grazing and trampling) associated with Alternative 3 would be expected to have a long-term positive effect on vegetation composition along stream reaches accessible to cattle over current management (Alternative 2). The positive effects associated with the implementation of Alternative 3 would likely be less immediate than with Alternative 1, which would discontinue livestock grazing.

Adaptive management strategies and treatments proposed to enhance aspen would not impact stream functionality. The aspen stand in the Fridley allotment is a seral community associated with uplands, not riparian areas.

Lewis Creek Allotment

The Lewis Creek Allotment is currently vacant by the permittee's choice. With the implementation of Alternative 3, the north pasture of the Lewis Creek Allotment would be removed and become a part of the Dry Creek Allotment allowing for better management flexibility due to the topographic features found within the allotment. The new Dry Creek Allotment would be used in conjunction with an NRCS grazing plan.

The specific actions proposed with Alternative 3 for the Lewis Creek Allotment would, over time, return affected streams to proper functioning conditions and would allow for no more than 20% annual livestock induced bank damage along the lower ½ mile reach of the Mill Fork of Hyalite Creek, as outlined on pp. 2-11 & 2-12. Alternative 1, by the continued elimination of livestock grazing would also return area streams to a proper functioning condition, and likely in a shorter timeframe than with the implementation of Alternative 3.

With implementation of Alternative 3, Adaptive Management action impacts are expected to meet channel stability guidelines and proper functioning condition over the long-term. The impacts to riparian vegetation under Alternative 3 would likely decrease from those associated with Alternative 2 (proposed action) due to the utilization of Adaptive Management strategies, which include increased monitoring.

Sunnybrook Allotment

Topography precludes grazing along the Big Creek riparian corridor so there is no potential for riparian vegetative utilization, bank trampling, or associated effects along Big Creek with implementation of any of the alternatives. Thick deciduous riparian vegetation limits livestock access to Hyalite Creek to a few trail crossings. Thus, the potential for streambank, or stream channel degradation is minimal. Except for along trail crossings, existing conditions are near pristine and well above the 75 % implementation guidelines and would be expected to continue as such with any of the alternatives. The streams and riparian areas in this allotment are currently (Alternative 2) meeting the DFC's due to topography and vegetation restrictions.

Continued grazing under the Adaptive Management strategies would result in minimal or no effect on bank stability, channel form and function, and fish habitat quality. Impacts from implementation of Alternative 3 would be similar to those associated with Alternative 2 (proposed action). Impacts from grazing would continue to be within Forest Plan standards and guidelines with either alternative.

With the implementation of Alternative 3, the allotment would be monitored on a regular basis to ensure that Forest Plan standards and DFCs continue to be met. No phases would be established for this allotment unless monitoring results define the need for such actions.

Dry Creek Allotment

As a part of Alternative 3 (Adaptive Management), a fourth allotment would be created. The new Dry Creek Allotment would incorporate Section 4 T6S, R7E and Section 32 T5S, R7E of the Fridley Creek Allotment, Section 6 T6S, R7E of the Lewis Creek Allotment and parts of Section 5 T6S, R7E, which is privately owned land (See Map 7). The Dry Creek Allotment would include Dry Creek, currently in the Fridley Allotment, and a reach of Hyalite Creek, currently in the Lewis Allotment. Forest Plan standards and DFCs for these two streams are currently being met. Refer Appendix B for site specific utilizations numbers. These utilization standards would be used as a monitoring tool to be measured periodically to determine management effectiveness.

With the implementation of Alternative 3, Forest Service management of the entire allotment (NFS and PVT) would eliminate the possibility for any trespass issues, allow for an overall increase in riparian vegetative biomass, and make the entire area more manageable due to the geographic restrictions. Impacts to streambank, and/or stream channel stability would be minimal. from livestock grazing and would be expected to remain within Forest Plan standards and guidelines.

With the implementation of Alternative 3, the allotment would be monitored on a regular basis to ensure that standards and DFC's continue to be met. The effects of livestock grazing to streambank and stream channel stability on the private land portion of the allotment would also be monitored No phases would be established for this allotment with Alternative 3, unless monitoring results define the need for such actions.

Cumulative Effects and Reasonably Foreseeable Actions

Effects Common to All Alternatives

NEPA requires consideration of the cumulative effects resulting from past, present, and reasonably foreseeable future actions. Any project affecting the same resources as the proposed project, over the same time period should be included in the examination of cumulative effects. Those would be any that overlap both temporally and geographically within the analysis area boundaries described above.

Large woody debris in high gradient mountain streams is a critical component in maintaining channel and streambank stability and fish habitat diversity. When LWD is removed from a stream channel, the energy that is otherwise dissipated against those flow obstructions is dissipated on the bed and banks of the channel. When energy from high streamflow events, (i.e., during spring snowmelt runoff, or increased flows following forest fires) is concentrated on the bed and banks of streams, the rate of channel incision and/or bank erosion increases. Erosion rates vary by channel type, and can sometimes result in dramatic change. The amount of streambed or streambank erosion is also cumulatively affected by bank trampling and utilization of riparian vegetation by cattle. These cumulative effects are identified in the affected environment narrative for streams throughout each allotment and are described in the Affected Environment (p. 3-10) and below. In addition, the cause and effect relationships that are cumulatively expressed in the existing condition narrative are also considered in DFC's. Proposed grazing management changes identified in Alternative 3 are intended to address grazing related affects and move toward a DFC, recognizing that other cumulative disturbances also influence the ability to attain the DFC for a given stream or stream reach.

Fridley Allotment

For the Fridley Allotment, some stream reaches within Section 27 were selectively harvested in the 1930's and 1940's, which caused local reductions in LWD recruited to the stream channel. Reaches of Miller Creek, South Fork of Miller Creek, and the North Fork of Miller Creek have been affected by various levels of riparian harvest, with subsequent loss of LWD in channels. Channel related changes have occurred in these stream reaches, and effects were exacerbated during post-Fridley Fire runoff events. Conversely, Fridley Creek proper has not been impacted by riparian harvest to the extent other streams have.

Grazing would continue on private land within the Fridley Creek Allotment with all of the alternatives. The majority of the negative impacts on stream function that are currently occurring are on private land inside the allotment. It is anticipated that one outcome of implementing Alternative 1 would likely involve fencing private land boundaries, at least where there is primary range. This would likely result in even greater impacts to streams and riparian areas located on private land than with either of the action alternatives.

Lewis Creek/Sunnybrook/Dry Creek Allotments

No cumulative effects can be foreseen for Lewis Creek, Sunnybrook, or Dry Creek Allotments in regard to stream channel and streambank stability. With Alternatives 1 and 3, streambank stability and water quality/sedimentation would likely achieve near pristine reference conditions on the National Forest stream segments over time, however, re-introduction of livestock grazing techniques associated with Alternative 2 (Lewis Creek Allotment is currently vacant) could lead to a downward trend in streambank stability along the previously affected reach in Mill Fork Creek. The Paradise Valley Fuels Management and Prescribed Burning Project are also located within the Lewis Allotment. However, the burn units are located away from stream courses and no direct, indirect or cumulative affect is anticipated.

No other known past, present, or reasonably foreseeable actions would cause additional cumulative effects.

Relationship to the Forest Plan

ApplicableGallatin Forest Plan Standards include (Forest Plan pp. II-18,19,20,23):

- The Forest will be managed to maintain and, where feasible, improve fish habitat in order to achieve cooperative goals with MDFWP and to comply with State water quality standards (Fish Habitat, p. II-19, section 6.a.14)
- Emphasis will be given to the management of special and unique wildlife habitats such as wallows, licks, talus, cliffs, caves, and riparian areas (Wildlife and Fish, p. II-18, Section 6.a.8).
- Habitat that is essential for species identified in the Sensitive Species list developed for the Northern Region will be managed to maintain these species. These species include: Trumpeter Swan, Westslope and Yellowstone Cutthroat trout, Western Big Eared Bat, Spotted Bat, Ferruginous Hawk, Harlequin Duck, Boreal Owl, and Common Loon.
- Livestock grazing in riparian areas will be controlled at levels of utilization listed in Management Area 7 (see FP page III-19).
- Best management practices will be used on all Forest watersheds in the planning and implementation of project activities (see FP Appendix B and planning records – "Watershed Management Guidelines for the Gallatin National Forest").

Applicable forest wide goals include (Forest Plan pp II-1,2):

- Meet or exceed State of Montana water quality standards.
- Maintain and enhance fish habitat to provide for an increased fish population.

Applicable forest wide objectives include (Forest Plan pp II-4,5):

- Fish habitat will be managed by application of "best management practices". Management standards have been set to mitigate impacts occurring to the fishery resource from land use activities.
- Management of livestock will consider utilization levels in riparian zones.
- Allotments with continuous grazing during the growing period will be evaluated and alternative grazing systems will be applied.
- Watersheds will be managed by application of "best management practices". Management standards have been set to mitigate impacts occurring to the watershed resource from land use activities.

The Forest plan (MA7) requires the GNF to "manage riparian vegetation, including overstory tree cover, to maintain streambank stability and promote filtering of overland flows (Forest Plan page III-21)". Monitoring Item #5 in the Forest plan monitoring requirements (Forest Plan Table IV-1, page IV-5) lists two guidelines which relate to limits of cumulative

allowable management caused change to sediment filtration i.e. "more than a 25% loss in effective streambank cover" and stream channel stability i.e."20 point increase in stream channel score within 5 years due to management practices". These guidelines are used in conjunction with other monitoring data to determine whether the narrative standard above is being met. Riparian Area (Management Area 7) applicable goals and standards (Forest Plan pp. III-19,20,21) include:

- Manage the riparian resource to protect the soil, water, vegetation, fish, and wildlife dependent upon it.
- Maintain suitable habitats for those species of birds, mammals, and fish that totally or partially dependent upon riparian areas for their existence.
- Range improvements such as fences and water structures may be constructed to help meet the forage utilization standards listed below (see FP page III-20).
- Salting for livestock distribution will be outside of riparian areas.
- Concentration of livestock will be kept at a level compatible with riparian zone-dependent resource needs through development of pasture systems and associated improvements.
- Livestock utilization in riparian areas will follow these guidelines (see table in FP page III-20).
- Manage riparian vegetation, including overstory tree cover, to maintain streambank stability and promote filtering of overland flows.

2. Livestock May Be Impacting Vegetative Composition Around Seeps And Spring Sources

The areas around seeps and spring sources in Lewis Creek Allotment in Section 12, T6S, R6E and Fridley Creek Allotment in Section 34, T5S, R7E are void of vegetation due primarily to the usage by livestock for watering purposes. The locations of nearby water troughs and poor livestock distribution are the cause of this impact. The integrity of spring sources is critical to the supply of water flow from the developed water sources. In addition, the area provides habitat for migratory songbirds and other wildlife species.

Measurement Indicator: Anticipated response by birds to grazing in areas affected by grazing. This will in turn be analyzed through the key issues of stream functionality, vegetation composition around spring sources, and long-term health of aspen stands.

Direct and Indirect Effects

Effects Common to All Action Alternatives

Fridley Creek/Lewis Creek/Sunnybrook/proposed Dry Creek Allotments

Livestock grazing impact seeps and spring sources associated with constructed water developments in a manner similar to riparian areas. Cattle only lightly impact the majority of these seep and spring habitats on the Fridley Creek, Lewis Creek, and Sunnybrook

Allotments. These lightly impacted areas exhibit a high similarity to the potential natural community. They are either inaccessible to livestock, produce forage that is not suitable for livestock, or are grazed only in passing and not used for extensive periods for loafing and shade.

Some seep and spring areas have been identified as low to moderate similarity to the potential natural community, where livestock have concentrated in these productive and accessible moist areas, modifying riparian vegetation communities. Trampling, browsing, and grazing may retard development of healthy shrub communities having varying effects on migratory bird habitat. Individual migratory bird species respond differently to livestock grazing impacts. The individual response is based on the type of habitat affected, the type of nest structure used by that species, and the type of foraging requirements. Some species respond negatively to grazing, some positively, while others show an inconsistent or weak response to grazing. Seep and spring sources (riparian areas) are key habitats for migratory birds as more than half of western landbird species breed exclusively or primarily in deciduous vegetation associated with water. Migratory birds are especially vulnerable to degradation of seep and spring habitat due to its limited distribution and extent across the landscape. Migratory bird species that utilize riparian vegetation communities degraded by livestock grazing may experience fewer or lower quality nesting opportunities, less cover making them susceptible to predation, diminished feeding opportunities, and general disturbance.

Many of the species that respond negatively to livestock grazing are also subject to nest parasitism. Migratory birds in seep and spring (riparian) habitat are vulnerable to parasitism, which may be attributed to population declines in some species. Cowbirds are obligate brood parasites that use small, passerine, open-cup nesters as hosts. Cowbirds are closely associated with agricultural landscapes and the presence of livestock. There is a positive association with livestock presence, foraging opportunities for cowbirds, and their period of egg laying. Therefore, the risk of cowbird parasitism would be low when livestock are not turned on to the allotments until after July 1. Most birds would be done nesting or nesting would be far along enough that cowbirds would not parasitize nests.

Alternative 1- No Action/No Grazing

Fridley Creek/Lewis Creek/Sunnybrook Allotments

Under Alternative 1, there would be no livestock grazing on the Fridley Creek, Lewis Creek, or Sunnybrook Allotments. The lack of livestock on the allotment would eliminate any human activity associated with permitted livestock grazing, and seep and spring habitat degradation from occurring. Those seep and spring (riparian) areas with physical site characteristics and plant communities that reflect generally low or moderately low grazing disturbance regimes would improve to their potential natural community. Alternative 1 would provide for an overall increase in riparian vegetation biomass. This recovery would likely be dramatic initially, as would the increase in plant density in these areas. Within the allotments as a whole and over a long period of time, riparian plant communities may have a more favorable composition of native species. This would be a result of plant species that increase in density from repeated grazing no longer receiving that annual stimulus. Soil

disturbance from cattle would not be present; therefore susceptibility to invasion by certain invasive weed species may be less. Without grazing, the threat for fire to be ignited and/or carried in riparian areas is slightly higher. Fine fuels would build up over time, but then the natural process of decomposition sets in, leveling off most of the increased ignition probability.

The plant communities would have fully developed structural layers and a high number of the adapted desired plant species. Canopy cover of desired native sedges, grasses and forbs would increase dramatically. Introduced and native species may persist but at relatively low levels. Willows and other desired woody species would grow vigorous as demonstrated by their robust establishment and successful reproduction. Long term, dense riparian shrub communities and subsequent extensive wet soils would discourage livestock impact to seep and spring areas.

The effects of removing livestock would be beneficial for those migratory bird species that rely on complex riparian vegetation such as Lazuli bunting, willow flycatcher, common yellowthroat, and some sparrow and warbler species. For these species, the increase in diversity and biomass of vegetation would increase niche space for nesting and cover. Other species that respond favorably to livestock grazing (robin, pine siskin, and bluebird) may shift habitat use or move to areas with livestock concentration. The risk of cowbird parasitism would decrease or be eliminated due to the absence of livestock. Some risk may still persist due to livestock grazing on adjacent private lands.

Alternative 2 – Proposed Action-Current Management

Fridley Creek/Lewis Creek/Sunnybrook Allotments

With the continued implementation of current management (Alternative 2), those seep and springs areas (riparian areas) that are currently at their potential natural community (Big Creek, Lewis Creek, Hyalite Creek, Dry Creek, Fridley Creek, Miller Creek, and an unnamed creek in Section 6) would most likely be maintained. Other seep and spring areas with physical site characteristics and plant communities that reflect intense, long term grazing disturbances (Mill Fork Creek, Upper Miller Creek, South Fork Miller Creek, North Fork Miller Creek, Golmeyer Creek, and an unnamed creek in Section 34) would continue to increase in size and extent. Plant communities in seep and spring areas that have been identified above as expressing a departure from potential natural community would be missing or have poorly developed structural layers. Long-term, shrub communities may be absent where the site has the potential to support them or are comprised of decadent heavily browsed individuals adapted to constant disturbance. Desirable woody species adapted to the site would not be present or would fail to reproduce successfully. Willows and other desired woody plants would also exhibit poor vigor as demonstrated by a high to moderate level of browsing, leading to mortality of shrubs.

Season long grazing leads to moderate to heavy use every year and does not allow plants a chance to rotate through various phonological stages. This causes reduced plant vigor or prevents reproduction leading to a reduction in riparian community diversity allowing for

non-desirable species to become established. Soil disturbance from cattle could also make areas more susceptible to invasion by certain weed species.

Migratory birds and their habitat would continue to be impacted as current livestock levels and management would continue as they are today. The continued use of season-long grazing would result in unfavorable habitat conditions, as there are no areas of rest from livestock grazing during the permitted season. With Alternative 2, those species dependent upon seep and spring areas would have slightly less habitat available to them in the areas lacking native vegetation than with either Alternative 1 (no grazing) or Alternative 3 (adaptive management). Other species would respond favorably to continued livestock grazing in seep and spring areas. The risk of cowbird parasitism would persist at current levels and may increase long-term.

Based on the discrepancy between desired and existing conditions on some riparian segments, current management does not appear to be meeting Gallatin Forest Plan Standards for Wildlife and Fish (p. II-18, Section 6.a.8) for emphasis of special and unique wildlife habitats such riparian areas.

Alternative 3 - Adaptive Management Alternative

Fridley Creek/Lewis Creek/Sunnybrook/Dry Creek Allotments

Implementation of Alternative 3 (adaptive management) would allow cattle to graze using a deferred grazing rotation system on the Fridley Creek Allotment, and a seasonally deferred rotation grazing system on the Lewis Creek, Sunnybrook, and Dry Creek Allotments. Riparian vegetation biomass would likely be removed early in one pasture and deferred until late the next season. Plant litter, production and vigor should increase under this management strategy. Impacts to riparian vegetation from cattle grazing would decrease from current permitted levels (Alternative 2).

With the implementation of Alternative 3 (adaptive management), seep and spring areas (riparian) with a high similarity to the potential natural community would be maintained. Those with a moderate or low similarity would recover and move toward high similarity. This includes the sources to water developments. Once livestock is excluded, the springs will begin to recover. This is particularly true for the spring in Section 34 of the Fridley Creek Allotment. Structural layers would increase. Desired plant species would increase in vigor and compete with undesirable non-native plant species. A full complement of desired plant species adapted to some level of grazing would occur long-term. Willow and other desirable shrubs would also increase in vigor as browsing and trampling is decreased. Desired woody species adapted to the site, if not already present, would become established and reproduce successfully.

Adaptive management strategies and treatments proposed to enhance aspen would not impact seeps and springs. The aspen stand in the Fridley allotment is a seral community associated with uplands, not areas with seeps and springs (riparian).

Extensive monitoring is required as a part of the Adaptive Management Alternative (See pp. 2-19 through 2-27). If monitoring results indicate that the enlarged exclosures are not enough to allow the spring sources to recover to their full extent, or if livestock are consistently exceeding utilization levels, then either an alternative water source would be constructed in an adjacent drainage (Fridley Creek Allotment) or the tank will be moved farther away from the source (Lewis Creek Allotment). This would provide for better livestock distribution and allow the areas to move toward desired future conditions. Spring sources at newly constructed water developments would also be protected to mitigate from additional livestock damage to these sensitive areas.

Migratory bird species that depend on seep and spring (riparian) habitats, in whole or partially would benefit from the implementation of the adaptive management practices. Other species that prefer shorter vegetation and are tolerant of some level of grazing would continue to be present on the allotments. By improving degraded seep and spring areas to provide better structural and plant species diversity, yet still allow some level of grazing; Alternative 3 may be beneficial to a larger array of bird species.

With the adaptive management option of early season grazing when range readiness conditions allow, there is the potential for livestock to be on the allotments during bird breeding and nesting periods. This may increase cowbird parasitism if cowbirds arrive on the allotments earlier in the bird breeding cycle. This would not occur every year, however, and would only occur within one area of each allotment, thus minimizing effects to nesting birds. In contrast, the removal of introduced non-native grasses such as Timothy grass may increase the cover and vigor of native perennials, which in turn would provide additional niches for nesting and cover.

The adaptive management alternative would have less negative effects to migratory songbirds and improve habitat more than current management (Alternative 2). The shift to deferred grazing instead of season-long grazing would provide some areas of unaltered shrub steppe and grassland habitats for migratory birds and allow concealment of ground nests through the first incubation period. The adaptive management alternative identified practices to move riparian habitats toward the desired future condition thus meeting Gallatin Forest Plan Standards for Wildlife and Fish (p. II-18, Section 6.a.8) for emphasis of special and unique wildlife habitats such as riparian areas.

Cumulative Effects and Reasonably Foreseeable Actions

Effects Common to All Alternatives

Fridley Creek/Lewis Creek/Sunnybrook/proposed Dry Creek Allotments

Cumulative effects assessment requires consideration of past, present and reasonably foreseeable events. Vegetation altering processes can have very long-lasting effects on wildlife habitat. Past impacts to wildlife habitat are reflected in the current baseline vegetation used for analysis. Past activities within the project area include historical livestock grazing for the last century. Open range laws and lack of fences undoubtedly led to heavy grazing throughout the area. Fire suppression, along with grazing, altered plant

communities' biomass production, species composition, and diversity. Conifers have encroached into non-forested areas historically kept from climax conditions with frequent fire. Noxious weeds were introduced and infestation levels have increased in some areas. Past logging and road building have also contributed to altered habitats in some areas of the allotments. Wildlife management of big game populations by permit has evolved to present day permits, seasons, and protections.

Presently, these activities continue to this day on National Forest although livestock numbers are probably at their lowest. Much of the project area does not provide for public access and therefore limits administrative management as well. Logging, farming, ranching, and development continue on private lands. The Paradise Valley Fuels Management and Prescribed Burning project is currently being implemented. One treatment area includes units on the Lewis allotment. No adverse affects on migratory birds, or other wildlife species, were anticipated. The majority of species will not be impacted or will benefit from this activity.

Activities on the National Forest that may occur in the future are additional aspen treatment, fuel reduction projects (especially adjacent to private lands), and increased levels of recreation. Any future federal actions in the project area that are not being considered at this time, will undergo a separate analysis, based in part on an understanding of the consequences to wildlife habitat incurred by the currently proposed project.

Reasonably foreseeable actions that may occur within the project area on private lands include increased subdivision, private land development, and subsequent loss of habitat for migratory birds and other wildlife species. Private lands will continue to harvest timber, build roads, and conduct agricultural activities such as farming and ranching. Grazing by wild ungulates will continue as will the hunting seasons managed by the State of Montana Department of Fish, Wildlife, and Parks.

The combined effects of the past, present, and reasonably foreseeable activities in the project area on migratory birds include changes in riparian plant communities related to grazing and fire suppression over the last century, removal of vegetation by grazing in riparian areas on an annual basis, increased use of the area by cowbirds following livestock into the area resulting in the subsequent parasitism of some migratory birds nests, and the short-term loss of ground nesting habitat due to planned prescribed burns and grazing. Livestock grazing associated with the action alternatives would not cumulatively add to any impacts to migratory bird habitat that have not already occurred under current management (Alternative 2). None of the alternatives would result in adverse cumulative effects on migratory birds. The adaptive management alternative would benefit riparian and aspen habitat. More restrictive utilization standards and movement toward desired conditions for riparian and aspen habitats would result in improved conditions for migratory birds.

Relationship to the Forest Plan

Gallatin Forest Plan Standards for Wildlife and Fish (p. II-18, Section 6.a.8) include:

- Emphasis will be given to the management of special and unique wildlife habitats such as wallows, licks, talus, cliffs, caves, and riparian areas.
- Riparian areas and aspen were identified as habitats in need of improvement.

3. Livestock May Be Impacting the Long-term Health of Aspen Stands

Successful aspen recruitment is not occurring on some of the more heavily used livestock areas such as in the Fridley Creek Allotment in Section 34, T5S, R7E, which is creating a negative affect on migratory bird habitat. Livestock browsing is considered to be the cause the majority of impacts to aspen stands. Elk and deer browsing are also contributing to these impacts.

> ***Measurement Indicator:*** Anticipated response by birds to grazing in areas affected by grazing. This will in turn be analyzed through the key issues of stream functionality, vegetation composition around spring sources, and long-term health of aspen stands.

Direct and Indirect Effects:

Effects Common to All Action Alternatives

Both livestock and native herbivores modify aspen habitats by grazing understory vegetation, browsing developing aspen sprouts, and making regular use of stands for bedding and summer thermal cover. Direct effects of grazing include removal of plant cover and alteration of the plant community. Browsing reduces aspen growth, vigor, and numbers and can drastically reduce or eliminate sprouts (DeByle 1985a). Domestic livestock browse the aspen with increasing pressure through summer and fall. This impact is greatest on shrubs and young trees less than approximately thirteen feet tall. Trampling that can occur with grazing and browsing damages vegetation, compresses litter cover on the soil surface, and compacts soil. The combined effect of grazing, browsing, and trampling may ultimately increase erosion and soil runoff.

Grazing within aspen stands can limit the optimal use to migratory birds. The effect of grazing in aspen stands on migratory birds and their habitat is similar to those incurred in riparian habitat. Ground nesting birds are very susceptible to habitat alteration and trampling by grazing animals (DeByle 1985b) as cover is reduced and predation increases. This may alter populations and relative species abundance (DeByle 1985a). Maintaining and restoring aspen is important because of its exceeding high biodiversity (Kay 1997). A decline in aspen on the landscape could lead to significant declines in nest success for birds (Struempf and others 2001). They suggest that Adaptive Management strategies that could be used to treat aspen include prescribed fire. Treatments are needed to retain aspen on seral sites and to retain a variety of age and size classes on the landscape (DeByle 1986). Aspen forests do not burn readily but are extremely sensitive to fire (Jones and DeByle 1985). A fire intense enough to burn the overstory will stimulate abundant suckering although suckering response varies widely due to genetic and site factors.

Livestock grazing can reduce the annual layer of forage production, along with residual standing litter, which makes up the fine fuel necessary to carry a prescribed fire. This reduces the flammability of the aspen forest and inhibits success of a fire treatment. Kay (1997) states that while aspen need fire to regenerate; the clone will die or fail to regenerate if the new sprouts are browsed. Heavy browsing following a treatment to induce suckering can deplete aspen root reserves, jeopardize successful regeneration, and threaten stand survival (Shier and others 2001). They suggest that proposed treatments must not be initiated until browsing relief is obtained. Other techniques such as commercial harvest, removal of vegetative competition, protection of regeneration from herbivory or mechanical root stimulation, also serve to stimulate regeneration of the clone (Schier and others 2001, Shepperd 2001).

Alternative 1: No Action-No Grazing

Fridley/ Lewis Creek/Sunnybrook Allotments:

Under Alternative 1, there would be no livestock grazing on the Fridley Creek, Lewis Creek, or Sunnybrook Allotments. The lack of livestock on the allotment would eliminate any aspen habitat alteration associated with permitted livestock grazing. Depending on the level of browsing by native ungulates, aspen regeneration would increase drastically providing age and structural diversity long-term. Migratory birds would benefit by the increased cover protection from predation, enhanced foraging opportunities, and temporally arrayed nesting opportunities, reduced cowbird parasitism, and additional habitat niches.

Alternative 2: Proposed Action-Current Management

Fridley Allotment

The effect of grazing in aspen stands on migratory birds and their habitat is similar to those incurred in riparian habitat. Migratory birds would continue to be impacted as current livestock levels and management would not change appreciably with Alternative 2. Those species dependent upon aspen habitat would have not as much habitat available to them than with either Alternative 1 (no action) or Alternative 3 (adaptive management). Other species would respond favorably to continued livestock grazing in aspen stands. The risk of cowbird parasitism would persist at current levels.

Lewis Creek/Sunnybrook Allotments

There are not currently any known seral aspen communities located within the Lewis Creek, or Sunnybrook Allotments. Continued grazing under the current management (Alternative 2) would have no impacts to migratory bird aspen habitat. If seral communities were to be found within any of these allotments, the effects of continuing with the current management would be the same as that for the Fridley Creek Allotment.

Alternative 3: Adaptive Management

Fridley Creek Allotment

Livestock management options of deferment, salting and riding strategies, and restricting browse utilization levels, identified in Phase One of Alternative 3 for the Fridley Creek Allotment, would minimize the use of aspen. Less forage utilization of the area with aspen would allow more vigorous ground flora to develop, creating nesting habitat for ground nesting migratory birds and improving foraging. Less browse utilization would promote structural complexity by removing one source of browsing on young trees. Browsing by native ungulates would continue but does not seem to be the limiting factor in this area.

Phase One of Alternative 3 also identified falling conifers within the aspen stands to open them up to sunlight and hinder livestock movement and use in the stand. Research conducted by Ripple and Larsen (in press) tested the hypothesis that fallen conifers would provide refugia to aspen regeneration under levels of heavy browsing. Their findings indicated that there was a significant difference between aspen height within jackstraw sites of >0.8 m high and those subjected to ungulate browsing in the open. While this study was done on post 1988 fire debris in Yellowstone National Park, they suggest that coarse woody debris to provide barriers for cattle should be very effective and recommend this as an experimental strategy prior to investing in exclosure fences. Falling conifers within the aspen stand may serve to deter livestock grazing within the stand allowing for aspen regeneration survival and successful recruitment, thus improving migratory bird and other wildlife habitat.

If monitoring shows that falling conifers is not sufficient to progress toward desired conditions for aspen, then an alternative water source would be developed in an adjacent drainage to further discourage overuse by livestock. In addition, if aspen fail to sprout, burning, felling or ripping the roots would be implemented to stimulate sprouting. Fire generally stimulates the production of aspen suckers and the rejuvenation of the stand. Desired mortality of mature aspen is generally dependent on fire intensity and severity, which in turn is dependent on local fuel conditions, weather, and previous year grazing utilization. This may result in a mosaic of burned and unburned areas and create a diversity of age classes.

It would be critical to manage livestock use after a physical disturbance due to the flush of sprouts and subsequent attraction to ungulates. Fencing may be required if ungulate browsing is found to be limiting the successful regeneration of aspen sprouts. This is identified as Phase Three and would ultimately protect regenerating aspen from browsing ungulates but would be very economically prohibitive requiring additional infrastructure maintenance and management responsibilities.

The adaptive management alternative includes management activities, based on monitoring and progress toward the desired future condition, to enhance aspen through prescribed fire. Meeting the desired future conditions for aspen habitat with any or all of the adaptive management practices would improve nesting cover for ground nesting birds and provide

long-term array of opportunities for shrub and cavity nesters. This would lead to greater nest success over time. An increase in age and structural diversity would also improve foraging opportunities and increase biodiversity for migratory birds and other wildlife species. This action would be consistent with Gallatin Forest Plan Standard for Vegetative Diversity (p. II-18, section 6.c.1) to manage vegetative communities such as aspen with prescribed fire to produce and maintain desired vegetative conditions.

Lewis Creek/Sunnybrook/Dry Creek Allotments

There are not currently any known seral aspen communities located within the Lewis Creek, Sunnybrook, or proposed Dry Creek Allotments. If seral communities are found within any of these allotments in the future, the Adaptive Management strategies identified as part of Alternative 3 for the Fridley Creek Allotment would be applied to these areas. Direct and indirect effects would be expected to be the same or similar to those described above for the Fridley Creek Allotment.

Cumulative Effects and Reasonably Foreseeable Actions

Fridley Creek/Lewis Creek/Sunnybrook/Dry Creek Allotments

Cumulative effects assessment requires consideration of past, present and reasonably foreseeable events. See the discussion of cumulative effects under Issue #2. The combined effects of the past, present, and reasonably foreseeable activities in the project area on migratory birds and other wildlife species include changes in plant communities related to grazing and fire suppression over the last century, removal of vegetation by grazing on riparian habitat on an annual basis, increased use of the area by cowbirds following livestock into the area resulting in the subsequent parasitism of some migratory birds nests, and the short-term loss of ground nesting habitat due to planned prescribed burns and grazing. Livestock grazing in the action alternatives would not cumulatively add to any impacts to migratory bird habitat that have not already occurred under current management. None of the alternatives would result in adverse cumulative effects on migratory birds (Alternative 2). The adaptive management alternative would benefit riparian and aspen habitat. More restrictive utilization standards and movement toward desired conditions for riparian and aspen habitats would result in improved conditions for migratory birds. The Adaptive Management Alternative would benefit aspen habitat; the more restrictive utilization standards and movement toward desired conditions in aspen habitats would result in improved conditions for migratory birds as well as other wildlife species.

Relationship to the Forest Plan

Gallatin Forest Plan Standard for Vegetative Diversity (p. II-18, section 6.c.1) includes:

- Forest lands and other vegetative communities such as grassland, aspen, willow, sagebrush, and whitebark pine will be managed by prescribed fire and other methods to produce and maintain the desired vegetative conditions.

Comparison Of Effects Of The Alternatives On The Key Issues by Allotment

Tables 2-8 through 2-11 (pp. 2-16 through 2-19) provide a comparison of the effects of Alternative 1 (no action/no grazing), Alternative 2 (current management), and Alternative 3 (adaptive management) to the key issues for each of the allotments.

V. Applicable Laws, Regulations and Forest Plan Direction

The Gallatin National Forest Land and Resource Management Plan (1987)

This document tiers to the Final Environmental Impact Statement (FEIS) and Land and Resource Management Plan (Forest Plan) for the Gallatin National Forest (USDA Forest Service 1987 PF 206 & 206(a)). The Forest Plan provides direction for all resource management programs, practices, uses, and protection measures for the Gallatin National Forest. The Forest Plan subdivided the forest into 26 management areas (MA's). These areas are described in detail in Chapter 3 of the Forest Plan (FP, pp. III-2 through III-73).

The Gallatin Forest Plan directs that habitat is provided for identified management indicator species and those native indigenous species that use special or unique habitats. Effects of the proposal to management indicator animal species, big game, and other non-game species are addressed in this EA and Appendix A, pp. A-18 & A-19. The Forest Plan also provides specific direction for management of wildlife habitat by various management emphasis areas (MAs). The proposed livestock grazing would occur within several MAs. A description of these MAs was given in Chapter 1, Section VIII, Forest Plan Direction.

Management Area Direction

The Fridley Creek, Lewis Creek, Dry Creek, and Sunnybrook Project area lies within Management Areas 6, 7, 8, 9, 10, 11, 12, 16, and 17. Additional direction can be found in the Forest Plan on (pp. III-17-18, 24-39, and 50-53). Specific resource management direction is given in Chapter 2 of the EA.

Standards for wildlife in Management Area 7 are the most applicable to the three significant issues. The Forest plan (MA7) requires the GNF to "manage riparian vegetation, including overstory tree cover, to maintain streambank stability and promote filtering of overland flows". The Forest plan monitoring requirements (Table IV-1) monitoring item 5 lists two guidelines and standards which relate to limits of cumulative allowable management caused change to sediment filtration i.e. "more than a 25% loss in effective streambank cover" and stream channel stability i.e. a "20 point increase in stream channel score within 5 years due to management practices".

These standards would be met with the implementation of the Beaverhead-Deerlodge Guidelines and other practices identified for riparian areas in the adaptive management strategy. The Adaptive Management Alternative includes management activities to enhance aspen through prescribed fire, based on monitoring and progress toward the desired future condition. For other management areas with an emphasis on big game, no potential conflicts

were identified in the Fridley, Lewis, or Sunnybrook allotment project area. There is nothing in the Adaptive Management Alternative that is incompatible with wildlife direction for any of the management areas. However, based on the discrepancy between desired and existing conditions on some riparian segments and in aspen, current management (Alternative 2) does not appear to be in compliance with wildlife standards in Management Area 7, even if riparian utilization guidelines are being met.

Legal Requirements

This EA adheres to the following legal requirements:

Clean Water Act of 1977

The objective of this act is to restore and maintain the integrity of the nation's waters. This objective translates into two fundamental goals: (1) eliminate the discharge of pollutants into the nation's waters; and (2) achieve water quality levels that are fishable and swimable. This act establishes a non-degradation policy for all federally proposed projects. Alternative 3 incorporates adaptive management in order to assure continued compliance with the Clean Water Act, which provides overall direction for protection of water from both point and non-point sources of water pollution. Alternative 2 (current management) complies with this Act at this time; however, Lewis Creek Allotment is currently vacant. Alternative 1 (no grazing) would also comply with the Clean Water Act.

Endangered Species Act (ESA) of 1973

The Endangered Species Act (ESA) of 1973 mandates that the effects of land uses and management activities be evaluated as part of the biological assessment (BA) process for listed species. Under Section 7 of the Endangered Species Act, each Federal agency must ensure that any action authorized, funded or carried out is not likely to jeopardize the continued existence of any threatened or endangered species

The Fish and Wildlife Service (FWS) concurred with the Gallatin Forest Programmatic Biological Assessment for Activities that are Not Likely to Adversely Affect Listed Terrestrial Species (USFS 2004). The programmatic biological assessment was developed by the Level 1 Team to facilitate consultation. Any proposed action implements a screening process to determine which proposed projects properly fit within a programmatic approach to consultation on simple, straightforward projects that would result in a 'not likely to adversely affect' determination. The Fridley, Lewis, Sunnybrook, and Dry Creek Allotments proposed action and alternatives do fit within the programmatic screening process and is the basis for the discussion of bald eagle, lynx, grizzly bear, and gray wolf.

Determinations for the action alternatives are *"may effect - not likely to adversely affect"* on grizzly bear and lynx, *"no effect"* on bald eagle, and *"not likely to jeopardize"* the gray wolf. The decision screens, programmatic BA with concurrence letter, and the Consultation Summary Sheet for the Programmatic BA from the FWS are located in the project file. No concurrence is needed from the US Fish and Wildlife Service for "*no effect"* determinations or for 10J rule non-essential experimental species (gray wolf). There are no plants listed as threatened or endangered in the project area.

Executive Order 11990

Executive Order 11990 requires Federal Agencies to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when carrying out their responsibilities. Floodplains and small wetland areas would be improved over current conditions (Alternative 2) by implementing Alternative 3 (Adaptive Management Alternative). The No Action Alternative would also likely improve floodplain and wetland conditions by removing cattle from the National Forest portions of the allotment, however, the Forest Service would lose administrative authority over the private portions of the Fridley Creek, Dry Creek, and Sunnybrook Allotments.

Executive Order 12898 – Environmental Justice

Executive Order 12898 directs each Federal agency to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Where Forest Service proposals have the potential to disproportionately adversely affect minority or low-income populations, these effects must be considered and disclosed (and mitigated to the degree possible) through NEPA analysis and documentation.

The actions under any alternative would not adversely affect any disadvantaged or minority groups because of the project area's distance from large population centers and the diffuse level of adverse impacts on any social group. A project such as this would not produce hazardous waste or conditions that might affect human populations.

Federal Land Policy and Management Act of 1976 (FLPMA)

FLPMA authorizes the Secretary of Agriculture to issue permits for various uses on National Forest System lands. An allotment management plan (AMP) is defined in The Federal Land Policy and Management Act as a document, prepared in consultation with lessees or permittees that applies to livestock operations on public lands, and (1) prescribes the manner in and extent to which livestock operations are to be conducted in order to meet multiple use, sustained-yield, economic, and other needs and objectives, (2) describes range improvements to be installed and maintained, and (3) contains such other provisions relating to livestock grazing and other objectives found to be consistent with provisions of FLPMA.

The Federal Land Policy Management Act as amended by the Public Rangelands Improvement Act allows for AMPs to be included in grazing permits (43 USC 1753[d], as amended by 92 Stat. 1803 [1978] and 36 CFR 222.1 and 222.2).

Alternative 2 (proposed action) and Alternative 3 (adaptive management) were developed to comply with FLPMA. Alternative 1 (no action) would discontinue the grazing permit on National Forest Lands within the allotment.

Federal Noxious Weed Act of 1974, as Amended

This act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or

the public health. Alternative 2 (proposed action) would not violate the Federal Noxious Weed Act, as populations of weeds are currently being treated as necessary as a part of the regular district noxious weed program. Implementation of Alternative 3 would likely reduce the rate of spread of invasive species within the allotments over time through the use of adaptive management and intensive monitoring procedures. See Appendix A (Upland Vegetation, pp. A-1 through A-11). Alternative 1 (no action) would also likely reduce the rate of spread of invasive species over time. Removal of livestock from the allotments would likely result in an increase of native vegetation and other herbaceous species, which provide competition for invasive species. However, with Alternative 1 (no grazing), the Forest Service would lose administrative authority over the private portions of some of the allotments, which could still be in use.

Forest Service Manuals (FSM 2670)

Forest Service manuals (FSM 2670) provide policy under which Forest Service projects are designed to maintain viable populations of sensitive species. Sensitive species are those animal species identified by the Regional Forester for which population viability is a concern as evidenced by a significant current or predicted downward trend in population numbers, density, or in habitat capability that will reduce a species' existing distribution (FSM 2670.5.19). Protection of sensitive species and their habitats is a response to the mandate of the National Forest Management Act (NFMA) to maintain viable populations of all native and desired non-native vertebrate species (36 CFR 219.19). In accordance with the Forest Plan (Chapter II-19), a biological evaluation (BE) must be completed prior to implementation of activities that have the potential to affect managed species. As part of Forest Service Region 1 streamlining policy (August 17, 1995), we are no longer required to produce a "stand alone" biological evaluation for sensitive species, allowing all documentation relative to sensitive species to appear in the EA. Affects of the proposal to sensitive animal species are therefore only disclosed in Appendix A, pp. A-24 through A-28.

The project area does not provide suitable habitat, nor will any of the alternatives effect to any measurable degree, habitat for the peregrine falcon, trumpeter swan, harlequin duck, flammulated owl, wolverine, northern goshawk, black-backed woodpecker or Townsend's big-eared bat. Surveys have not found any populations of sensitive plants within any of the allotments, so they would not be affected by any of the alternatives.

FSM 2670.22 and 2670.32 gives direction to develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions. Forest Service actions must maintain viable populations of all native and desired non-native wildlife, fish, and plant species in habitat distributed throughout their geographic range and National Forest system lands and avoid or minimize impacts to species whose viability has been identified as a concern. If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. All of the alternatives being proposed would comply with FSM 2670.22 and 2670.32 direction.

Migratory Bird Treaty Act of 1918, as Amended

Migratory bird species are protected from harm under the Migratory Bird Treaty Act (16 USC 703-711). On January 10, 2001, President Clinton signed an Executive Order titled "Responsibilities of Federal Agencies to Protect Migratory Birds". On January 17, 2001, the USDA Forest Service and the USDI Fish and Wildlife Service signed a Memorandum of Understanding to complement the Executive Order. Upon review of the information regarding neotropical migratory birds in the wildlife report and Project File, neither of the action alternatives for livestock grazing, nor the no action alternative for the Fridley Creek, Lewis Creek, Sunnybrook and Dry Creek Allotments would result in a loss of migratory bird habitat nor be an extirpation threat to any migratory birds. Implementation of Alternative 3 (adaptive management) could actually benefit migratory birds within the Fridley Creek Allotment with the restoration of aspen habitat.

Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C 528)

The Multiple Use Sustained Yield Act of 1960 states "it is the policy of the Congress that the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes". Alternative 1 (no action) would not provide for grazing opportunities on National Forest land. Alternative 2 (proposed action) and Alternative 3 (adaptive management) would provide for continued grazing opportunities and range improvement through adaptive management practices.

National Environmental Policy Act of 1969, as amended (NEPA)

The National Environmental Policy Act (NEPA) of 1969 requires an assessment of the impacts of human activities upon the environment. NEPA establishes the format and content requirements of environmental analysis and documentation. The entire process of preparing this EA was undertaken to comply with NEPA.

National Forest Management Act of 1976 (NFMA)

This act guides development and revision of National Forest Land Management Plans. The National Forest Management Act (NFMA) requires that Forest plans "preserve and enhance the diversity of plant and animal communities...so that it is at least as great as that which can be expected in the natural forest" (36 CFR 219.27). Furthermore, implementation regulations for the NFMA specify that, "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area".

There are currently 8 terrestrial species identified as "Sensitive" that are known or suspected to occur on the Gallatin National Forest (USFS 2004). With the implementation of the action alternatives, livestock grazing on the Fridley, Lewis, Sunnybrook, and Dry Creek allotments would have *"no impact"* on peregrine falcon, trumpeter swan, harlequin duck, and black-backed woodpecker. The determination for flammulated owl, goshawk, Townsend big-eared bat, and wolverine for the action alternatives would be *"may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species"*.

There will be "*no impact"* to sensitive plants within the treatment areas due to lack of potential suitable habitat or absence of plants based on completed surveys. The wildlife and

sensitive plants report is in the project file. All alternatives were developed to comply with NFMA.

National Historic Preservation Act of 1966 (NHPA)

The Forest Service is mandated to comply with the National Historic Preservation Act (as amended 1993) [Public Law 89-665]. Section 106 of the NHPA requires that federal agencies with direct or indirect jurisdiction over undertakings afford the Advisory Council on Historic Preservation (ACHP) reasonable opportunity for comment on such undertakings that affect properties included in or eligible for inclusion to the National Register of Historic Places (NRHP) prior to the agency's approval of any such undertaking (36CFR800.1). Historic properties are identified by a heritage resource inventory and are determined as either eligible or not eligible properties for the National Register. Eligibility is reviewed, and concurrence given by the Montana Historic Preservation Office (MTSHPO). Sites that are determined eligible are then either protected in-place or adverse impacts must be mitigated. This process takes place prior to any decisions relative to the project. The Gallatin Forest Plan incorporates these requirements under the National Historic Preservation Act (1966). Forest Plan standards applicable to this project include inventory procedures, evaluation procedures, protection/preservation procedures, and coordination/consultation procedures (see FP II-14 and II-17).

Approximately 7 historic resource surveys have been completed for various ground disturbing projects in the study area. Additional sample surveys in high site potential areas were conducted 6/3/04 and 8/10-11/04 in preparation for this review. No historic sites were located within the project area. All of the alternatives being considered for the Fridley Creek, Lewis Creek, Sunnybrook, and proposed Dry Creek Allotments are consistent with the laws, regulations and Forest Plan direction discussed in this section.

American Indian Religious Freedom Act of 1994 (AIRFA), Native American Graves Protection Act of 1990 (NAGPRA)

The Gallatin Forest Plan incorporates the requirements under the following statutes: the National Historic Preservation Act (1966) and the American Indian Religious Freedom Act (1978). Forest Plan standards applicable to this project reflect the mandates under the above statues include inventory procedures, evaluation procedures, protection/preservation procedures, and coordination/consultation procedures (see FP II-14 and II-17). A scoping letter regarding the project was sent to the Crow Tribe. No comments were received from the tribe.

Approximately 7 cultural resource surveys have been completed for various ground disturbing projects in the study area. Additional sample surveys in high site potential areas were conducted 6/3/04 and 8/10-11/04 in preparation for this review. There is only one prehistoric site recorded within and 3 additional prehistoric sites within 1 mile of these allotments.

All alternatives being considered for the Fridley Creek, Lewis Creek, Sunnybrook, and proposed Dry Creek Allotments are consistent with the laws, regulations and Forest Plan direction discussed in this section.

The State of Montana Water Quality Act (1969, 1975, 1993, 1996)

The State of Montana Water Quality Act requires the state to protect, maintain, and improve the quality of water for a variety of beneficial uses. Section 75-5-101, MCA established water quality standards based on beneficial uses. The State has classified all waters within the allotments 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 (ARM 17.30.607).

Applicable standards for Montana's B-1 streams and rivers include maximum allowable increase in naturally occurring turbidity is 5 nephelometric turbidity units (NTU); and no increases are allowed above naturally occurring concentrations of sediment, settleable solids, oil, or floating solids, which will or are likely to create a nuisance or render the water harmful, detrimental, or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish, or other wildlife (ARM 17.30.623).

No areas within the allotments are currently known or suspected to have sufficient concentrations of livestock along or through streams to result in any type of water quality violations (Alternative 2). 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 allotments. See Appendix B (pp 1-15) for a complete description of stream conditions.

Alternative 1 would comply with the Water Quality Act with the removal of cattle from the National Forest portion of the allotments. However, cattle could still graze on private land within the allotments where the Forest Service would no longer have administrative control. Alternative 3 would utilize adaptive management practices throughout the allotments (private and National Forest land) in order to improve streambank stability in the problematic reaches, as well as improve overall riparian vegetative conditions.

VI. Other Disclosures

Other disclosures and criteria to be considered in order to make a determination of whether the proposed actions are major federal actions that would significantly affect the quality of the human environment and require the preparation of an Environmental Impact Statement (EIS) include the following:

Effects on Threatened and Endangered Species

Grizzly Bear: The project area is outside the Primary Conservation Area (PCA) as defined by the final Conservation Strategy for the Grizzly Bear in the Yellowstone Ecosystem (ICST 2003), however, suitable habitat exists and grizzly bears are known to use the area. Livestock grazing that occurs outside the PCA but within the distribution area of grizzly bears must follow screening criteria as identified in the programmatic BA Grizzly Bear Screening Process Part 2 (USFWS 2004b). There is no history of livestock depredation or control actions on the Fridley, Lewis, Sunnybrook, or proposed Dry Creek Allotments. Livestock grazing associated with the action alternatives would not increase or occur in new areas. In addition to the programmatic biological assessment, the recent Biological Opinion (USFWS 2004a) contains a section on Terms and Conditions Reporting Requirements included a statement specific to livestock depredation, which has been included in the mitigation section. The decision screens, programmatic BA with concurrence letter, Biological Opinion, and the Consultation Summary Sheet for Programmatic Biological Assessment from the FWS are located in the Project File. The action alternatives "may affect but are not likely to adversely affect" the threatened grizzly bear.

Gray Wolf: The Livingston Ranger District is within the Greater Yellowstone Wolf Recovery Area and wolves were listed as a non-essential experimental population. Habitat is available in the Fridley, Lewis, Sunnybrook, and proposed Dry Creek Allotments for wolves and their primary prey, elk. The Lone Bear wolf pack was lethally removed due to livestock depredations on private land in the Paradise Valley. While there are denning and rendezvous sites for packs across the landscape, none of these are known to occur in the project area or immediate vicinity. Overall population objectives for the recovery of the gray wolf have been met.

The recent final rule published in the Federal Register defines new regulations for nonessential experimental populations of the western distinct population segment of the gray wolf (USFWS 2005). This rule was issued to provide additional flexibility within the experimental population areas in recognition of the fact that wolves are numerous in the experimental population areas (USFWS 2005). Only permittees with a current Federal land use permit that requires livestock use may take wolves on public land and only when they are "in the act of" attacking those permitted livestock. Therefore, implementation of the action alternatives would be *"not likely to jeopardize"* the continued existence of the nonessential/experimental gray wolf.

Bald Eagle: The Fridley, Lewis, Sunnybrook, and proposed Dry Creek Allotments lie within the Bighorn Recovery Zone, which has a target of 11 nesting pairs as identified in the Montana Bald Eagle Management Plan 1994 (USDI 1994). The target of 11 nesting pairs was achieved several years ago.

Per the Programmatic Biological Assessment for Activities that are Not Likely to Adversely Affect Listed Terrestrial Species (USFS 2004), use of decision screens, and concurrence letter (USFWS 2004b), there would be "*no effect"* on the bald eagle. The project area is not within any known bald eagle nest site management zones, the project does not permit structures, and do not increase road kills in foraging habitat. The decision screens, programmatic BA with concurrence letter, and the Consultation Summary Sheet for Programmatic Biological Assessment from the FWS are located in the Project File.

Canada Lynx: According to the Gallatin National Forest lynx habitat map, the Sunnybrook allotment does not have any vegetation communities that contribute to lynx habitat. Portions of the Fridley, Lewis, and proposed Dry Creek Allotments contain vegetation communities that fit the LCAS model, however, these areas tend to be forested and therefore, not conducive to livestock grazing.

According to the Lynx Conservation and Assessment Strategy (LCAS), livestock may reduce forage resources available to snowshoe hares and other prey species in these habitats if it alters the structure or composition of native plant communities (Ruediger and others 2000). Livestock grazing is also addressed in the programmatic biological assessment (USFWS 2004b). Proposals that include livestock grazing must follow screening criteria as identified in the LCAS and programmatic BA. Issues relative to livestock grazing effects on the lynx may be eliminated due to effective mitigation. The decision screens, programmatic BA with concurrence letter, and the Consultation Summary Sheet for Programmatic Biological Assessment from the FWS are located in the project file. The determination for the action alternatives is *"may effect - not likely to adversely affect"* the Canada lynx.

Unique Characteristics of the Geographic Area

The Fridley Creek, Lewis Creek, Sunnybrook and proposed Dry Creek Allotments do not contain any ecologically unique or critical areas. However, the geology and spectacular beauty of the area is thought by many people to be very special. The allotments are located on the east side of the Gallatin Range within the upper Yellowstone River watershed approximately 15-30 miles southwest of Livingston, Montana. To a traveler on Highway 89 South, only portions of the Fridley Creek Allotment are visible as the eastern outslope of the Gallatin Range. The western edge of the allotments are not readily visible from any key recreation or travel corridors.

None of the allotments fall within the Gallatin Fringe Roadless Area #J1548 *(Forest Plan FEIS, C-32).* Nothing within the Adaptive Management Alternative, Proposed Action Alternative or the No Action Alternative has the potential of changing and/or modifying this inventory.

The allotments contain Big Creek, Lewis Creek, Hyalite Creek, Mill Fork Creek, Dry Creek, Fridley Creek, Miller Creek, Golymeyer Creek and several ephemeral tributaries. There are no

lakes or ponds. There are no major or large wetland areas. Private timber harvest, road building, and grazing activitie have impacted stream reaches on portions of the Fridley Creek allotment. Both of the action alternatives contain standards for grazing utilization levels for riparian and upland areas.

There are no Wild & Scenic Rivers or ecologically critical areas known to occur within the allotment boundaries.

Effects of the Alternatives on Prime Farmland, Rangeland, and Forest Land

There is no prime farmland, rangeland, or forestland located within the project area. There are 10,144 acres within the allotment boundaries with 4,717 acres that are considered to be suitable rangeland. Grazing has been active on these allotments for many decades. Adaptive management actions would improve the suitable range conditions over time by adjusting the number of grazing livestock to fit the carrying capacity of the land. Implementation of the Adaptive Management Alternative (Alternative 3) would help to better distribute the livestock in order to increase the native vegetative composition, lesson the occurrence of invasive weeds, aid in stabilizing stream banks, and help to return disturbed stream reaches to their proper functioning condition. The No Action Alternative (Alternative 1) may also somewhat improve suitable rangeland conditions over time by eliminating grazing, however, the Forest Service would lose administrative authority over the private portions of the allotments. The Current Management Alternative (Alternative 2)would not noticeably change rangeland conditions.

Effects of Alternatives on Floodplains and Wetlands

Floodplains and small wetland areas would be improved over current conditions (Alternative 2) by implementing the Adaptive Management Alternative (Alternative 3). Streams and wetland areas would be monitored on a regular basis. The opportunity to develop alternative watering sources would be assessed. Protective measures to be taken would be dependent on the results of monitoring, regarding whether an upward trend is occurring in restoring native vegetative composition, proper functioning condition of streams, stream bank stability, etc. . Alternative 1 would eliminate grazing on the allotments so it would be expected that small wetland areas and floodplain conditions would improve over time.

Effects of Alternatives on Social Groups

Neither of the action alternatives would have discernible effects on minorities, American Indians, or women, or the civil rights of any United States citizen. They would not have a disproportionate adverse impact on minorities or low-income individuals.

The proposed action and adaptive management action are intended to promote efficient use of intermingled ownership lands. The Fridley, Lewis, and Sunnybrook Allotments are an integral part of the current permittees' livestock operations and discontinuing the grazing permits, Alternative 1 (no action) would have an economic effect to the permittees and possibly the local community (see Appendix A, pp. A-35 through A-38).

Effects on Public Health and Safety

There would be no significant effects on public health and safety with any of the alternatives. The allotments consist of checkerboard ownership consisting of 58% National Forest and 42% private lands. There is minimal public access to roads on the allotment. The only public usage of the area is by the Big Creek Road #2500 to access the Lewis Creek Trail #181, or by permitted access granted by the private landowners.

Effects to Scientific, Cultural, or Historic Resources

The entire Fridley Creek, Lewis Creek, Sunnybrook and proposed Dry Creek Allotments were reviewed for effects to cultural and/or historic properties related to the re-issuance of grazing permits for these allotments. A scoping letter was sent to the Crow Tribe regarding the project. No comments were received from the tribe.

Approximately 7 cultural resource surveys have been completed for various ground disturbing projects in the study area. Additional sample surveys in high site potential areas were conducted 6/3/04 and 8/10-11/04 in preparation for this review. There is only one prehistoric site recorded within and 3 additional prehistoric sites within 1 mile of these allotments.

During survey of this sites, no mention was made that grazing has adversely affected the integrity of this site, and no negative effects to this known site would be expected from the proposal. If there were a need for any type of excavation within the National Forest portion of the allotment, such as constructing an alternative watering site, a heritage survey would be conducted prior to any ground disturbing activity. None of the alternatives being considered would be expected to have adverse effects to scientific, cultural, or historic resources.

Short-term Use versus Maintenance and Enhancement of Long-term Productivity

Short-term uses are those uses that generally occur annually. Long-term productivity refers to the ability of the land to produce a continuous supply of a resource. Implementation of the proposed action would improve both short-term and long-term productivity over current management (Alternative 2) by adjusting the number and providing for better distribution of permitted livestock to better fit the carrying capacity of the land. The project area has a history of extensive grazing for many decades. There are mitigation and monitoring requirements associated with both the proposed action (Alternative 2) and the Adaptive Management (Alternative 3) Alternatives. The Adaptive Management Alternative contains a stepped approach to corrective actions that would be taken depending on the results of the required monitoring. Important features associated with the adaptive management proposal include improvement of the proper functioning condition of streams, ensurance of streambank stability, reduction of invasive weed species, enhancement of the native vegetative composition, and enhancement of aspen regeneration within the allotment boundaries. . The purpose of adaptive management is to allow management the flexibility to be responsive to necessary adjustments in permitted actions.

Alternative 1 would eliminate grazing on the allotments so there would be no short term use associated with the National Forest portions of the allotments.

Irreversible and Irretrievable Commitment of Resources

An *irreversible* commitment of resources refers to the use or commitment of a resource that is incapable of being reversed or changed. For example, nonrenewable resources, such as minerals in the ore, would be removed forever during the milling of the ore and would be irreversibly lost or committed. Irretrievable commitment of resources refers to actions that result in changes to resources that cannot be recovered or regained. None of the alternatives would cause irreversible or irretrievable commitment of resources. The allotments have grazing histories that have occurred for many decades, sometimes very extensively.

Currently (Alternative 2) some areas within the allotment have infestations of invasive weeds and other non-native vegetative species out-competing the native vegetation. Some stream reaches are not operating within their proper functioning condition. Objectives of the Adaptive Management action (Alternative 3), to be met through monitoring and corrective action, are:

- Continue to promote the efficient use of intermingled lands.
- Utilize management techniques that will improve or help to reverse negative trends occurring to both the vegetative and riparian related resources.

Alternative 1 would discontinue grazing on the allotments and native vegetative conditions would likely improve on National Forest lands within the allotments.

Possible Conflicts with Other Land Use Plans, Policies, and Controls

The purpose of the Adaptive Management action is to revise and update the grazing permit and allotment management plan (AMP) in order to comply with the Gallatin Forest Land and Resource Management. The EA is consistent with the Public Law 104-19, Section 504(a), which requires land management agencies to schedule and complete NEPA analyses on all allotments where necessary to support grazing activities, the Multiple-Use Sustained Yield Act of 1960 that states that National Forests are established for outdoor recreation, range, timber, watershed and wildlife purposes, and the Federal Land Policy and Management Act of 1976, which authorized the Secretary of Agriculture to issue permits for various uses on National Forest Lands. The Adaptive Management Alternative (Alternative 3) and the proposed action (Alternative 2) also adhere to the legal requirements of. numerous other laws, regulations and guidelines that are cited beginning on p. 3-43 of the EA. None of the alternatives have known conflicts with any Land Use Plans, Policies or Controls.

Energy Requirements and Conservation Potential of Alternatives

The energy required to implement any of the alternatives in terms of use of petroleum or energy consuming products is insignificant. Livestock grazing on National Forest Land is an activity that has been ongoing for several decades and does not consume measurable amounts of any type of energy resource.

Probable Adverse Environmental Effects That Cannot Be Avoided

Implementation of the Adaptive Management Alternative (Alternative 3), which would continue grazing opportunities on intermingled National Forest and private land, would not result in adverse environmental effects that cannot be avoided. The proposal incorporates adaptive management direction to address changing livestock management concerns. Alternative 3 has been designed to be responsive to the effects of grazing on the various resources present within the allotment boundaries. Provisions are included to adjust management requirements/strategies to those that are the most responsive to the needs of the resources affected.

Implementing current management actions (Alternative 2) would continue to have some adverse effects to a portion of Miller Creek on the Fridley Creek Allotment (p. B-5). There could also be some adverse effects on the Mill Fork Creek of Hyalite Creek (C-12) in the Lewis Creek Allotment once grazing is reauthorized. Alternative 1 would discontinue grazing on the allotments so would not be likely to have avoidable adverse environmental effects.