Bangtail Mountains Road Decommissioning Project

Environmental Assessment

Gallatin National Forest

Bozeman Ranger District

Gallatin County, Montana

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Chapter 1.0 Purpose of and Need for Action

1.1 Contents of Chapter

This environmental Assessment (EA) has been prepared to document the potential environmental effects of decommissioning about 46.6 miles of road and obliterating about 1.2 miles of user-built all-terrain vehicle (ATV) trails in the Bangtail Mountains northeast of Bozeman Montana in 2006 (Figures 1 and Appendix 1, Figure 2). Chapter 1 contains information related to the purpose of and the need for the project, goals and objectives of the project, the decision to be made, and laws and regulations that influence this analysis.

1.2 Purpose of and Need for Action

The purpose of this proposal is to reduce the level of sediment entering streams that is attributable to roads and trails on National Forest System Lands in the Bangtail Mountains to bring area streams into compliance with Gallatin Forest Plan and Clean Water Act Standards.

The Gallatin Land Consolidation Act of 1998 (PL 105-267) directed the Forest Service to acquire about 54,000 acres of intermingled Big Sky Lumber Company lands (BSL) within the Gallatin National Forest. Most of these lands were roaded and logged by BSL. A key objective for the BSL land exchange was watershed rehabilitation. The BSL Legislative Environmental Impact Statement (EIS) and Report to Congress (Sept 1998) specifically mentions the need to conduct road decommissioning in the Bangtail Mountains (and other areas). The vast majority of roads proposed for decommissioning were constructed for the purpose of timber removal when these were lands owned by the Big Sky Lumber Company.

Decommissioning roads in the Bangtails road project is not a new idea. The Forest Service has recognized for many years that the high road densities were causing elevated sediment conditions in area streams. The Bangtail Travel Planning area is one of two National Forest Travel Planning areas that are above the Gallatin Forest Plan sediment standards (Forest Plan Appendix C-1). The other is Big Sky Travel Planning Area that is primarily private land. Sediment yield for the Bangtail Travel Planning area is 35 percent above natural. Required sediment standards for the Yellowstone cutthroat trout drainages in the Bangtails is 30 percent over natural. The biggest problem areas are Willow Creek (45 percent over natural) and Bangtail Creek (44 percent over natural).

In accordance with the Clean Water Act, the Montana Department of Environmental Quality (DEQ) is drafting the Total Maximum Daily Load (TMDL) sediment standard for the Shields River that is listed as a 303(d) water quality limited stream. The Shields TMDL process has identified critical rehabilitation actions needed for Clean Water Act compliance in the Shields drainage. The DEQ Shields River TMDL watershed rehabilitation plan will specifically require watershed rehabilitation work in Bangtail and Willow Creeks. Therefore, in order to comply with the Clean Water Act and the upcoming TMDLs, sediment reduction work is necessary. The best long-term resolution to the sediment problem is to improve the hydrologic function of these watersheds by rehabilitating roads (Appendix 1, Figure 2).

The Forest is proposing to conduct road decommissioning in 2006 because funding are available this year to complete the work. Deferring the work until a later date, for example until the Gallatin Travel Planning process is completed would delay meeting the Forest sediment standard and the TMDL standards for at least another year perhaps longer depending upon priorities and funding availability.

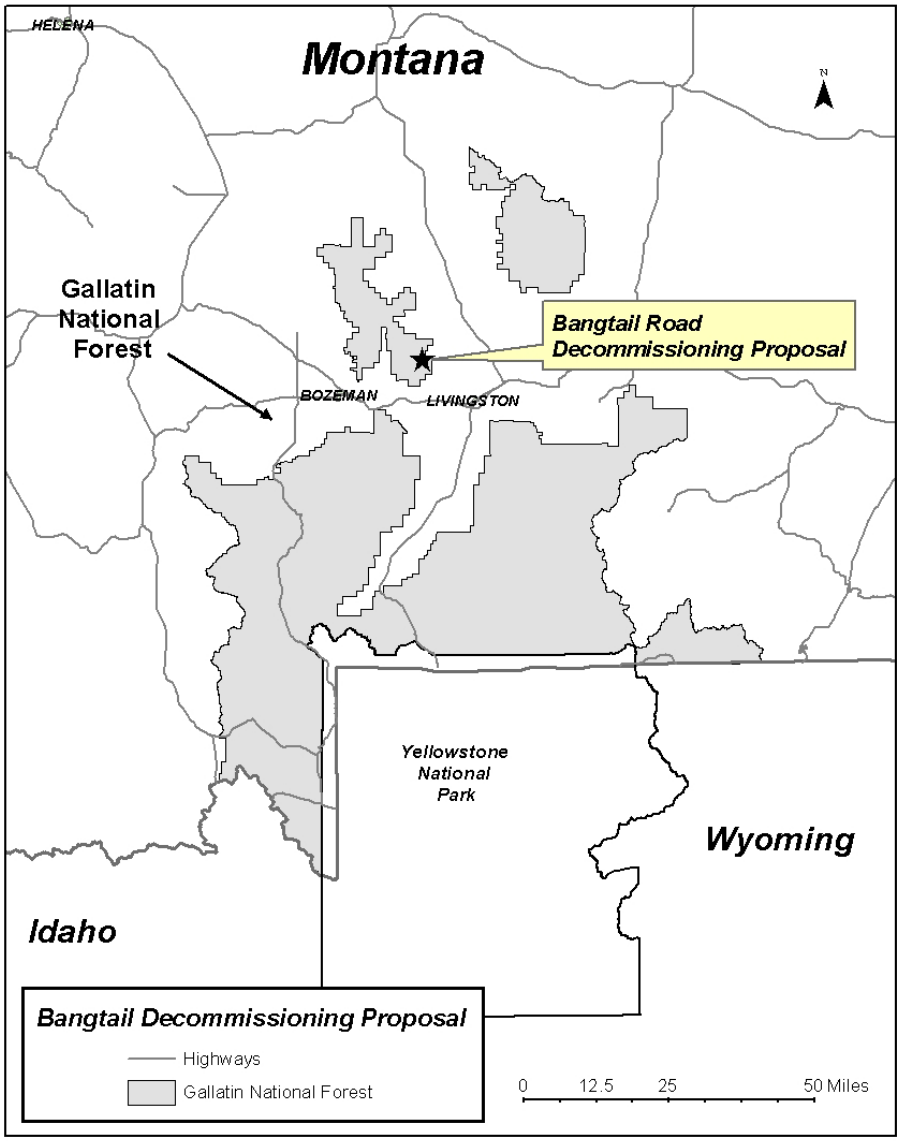

Figure 1. Vicinity Map. This map displays the general area of the road decommissioning proposal in relation to surrounding features.

Roads on the National Forest serve many beneficial uses. They provide motorized access for purpose of extracting natural resources, motorized access by the public for recreation, access for fire suppression, and create firebreaks, etc. However, since the roads were constructed, there have been many changes. Logging system technology now requires less miles of road (or in some cases no roads). There is also more awareness about the adverse environmental effects of roads.

Of all the land management activities that are undertaken, road construction has arguably contributed the most to cumulative degradation of streams. Roads are recognized as one of the longest lasting, detrimental, and intrusive activities on the environment. Many scientific studies document the impact of roads. These

include such things as increased sediment to streams caused by erosion of road surfaces, disruption of the hydrologic function of watersheds by the interception of surface and subsurface water flows, and mass wasting. There are also many effects on wildlife related to such things as disturbance during breeding and rearing, increased vulnerability of wildlife during hunting season, and poaching. Roads are also documented to have substantial impacts to wildlife related to vehicle wildlife collisions.

Project objectives to achieve this goal:

- Eliminate detrimental uses on those roads identified for decommissioning.
- Obliterate user-built trails not part of the Gallatin National Forest transportation system or those not planned to be part of the system in the upcoming Gallatin National Forest Travel Plan.
- Improve infiltration of water into the road surface to help restore surface and subsurface water flows.

Table 1.1. Road Densities by Hydrologic Unit. This table displays the road densities by 6th order hydrologic unit (NRCS 2004).

Name of 6th Order Hydrologic Unit (HUC)	Square Miles National Forest Land Area within each HUC (Acres of NFS/640 acres per sq mile)	Total Miles of Road on National Forest Land in each HUC*	Miles of Road per Square Mile of National Forest Systems Lands
Bangtail Creek	6.8	37.0	5.4
Brackett Creek	0.1	1.0	10.0**
Bridger Creek	1.0	2.0	2.0
Jackson Creek	4.5	25.0	5.6
Perkins Creek	1.5	6.0	4
Willow Creek	6.0	34.0	5.7

*Acres and miles rounded to the nearest whole number.
**Brackett Creek shows an abnormally high road density because one mile of road happens to bisect the only area of National Forest in that drainage. The average density overall is much lower.

Field reviews of these roads to determine their status and maintenance needs were conducted in 1996, 1998, 2002 and 2003 (Project Record, Hydrology).

- Reestablish natural stream flows where roads cross streams.
- Reduce sediment transport from road surfaces directly into streams.

1.3 Goals and Objectives

The overall goal is improve the hydrologic function of the watersheds and reduce sediment delivery into streams on the eastern and southern areas of the Bangtail Mountains and bring all Category A streams into compliance with the Gallatin Forest Plan, State of Montana and Clean Water Act standards.

1.4 Decision to be made

Based on the effects documented in this EA, the District Ranger will decide to either; proceed with the Bangtail Road Project; drop the proposal; or, if it appears the environmental effects may be significant, prepare an environmental impact statement. If effects are not significant, the District Ranger will prepare a decision notice and finding of no significant impact documenting the decision to implement the project.

1.5 Overall consistency with the Gallatin Forest Plan and other Laws and Regulations

This action is consistent with the Gallatin Forest Plan approved in 1987. This action also complies with the Endangered Species Act, the Clean Water Act, National Forest Management Act, Forest Service sensitive species policy, and does not violate and Federal State, or local laws or requirement imposed for the protection of the environment.

The Clean Water Act provides the overall direction for the protection of waters of the United States, from both point and nonpoint source of water pollution. The Montana Water Quality Act establishes general guidelines for water quality protection in Montana. It requires the protection of Montana's water, as well as the full protection of existing and future beneficial uses. All of the streams within the analysis area are classified as B1 streams under the Montana Water Classification system. The Administrative Rules of Montana (ARM 17.30.623) require that waters classified as B1 are suitable among other things for the "growth and propagation of salmonid fishes and associated aquatic life."

Presidential Executive Order 12962, signed June 7, 1995, furthered the purpose of the Fish and Wildlife Act of 1956, the National Environmental Policy Act of 1969, and the Fish and Wildlife Coordination Act, seeking to conserve, restore, and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. This order directs Federal agencies to "improve the quantity, function, sustainable productivity, and distribution of aquatic resources for increased recreational fishing opportunity by evaluating the effects of Federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order."

The Memorandum of Understanding and Conservation Agreement (MOUCA) for westslope cutthroat trout in Montana includes as objectives 1) protecting all pure and slightly introgressed (90% or greater purity) westslope cutthroat trout populations; and, 2) ensuring the long-term persistence of westslope cutthroat within their native range. The Land-use Strategy for Implementation of the 1999 Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana (Strategy) for the MOUCA, adopted by the Forest Service (FS) and Bureau of Land Management in 2002, further defines how the MOUCA will be implemented by federal land management agencies. For new activities, the Strategy stipulates that the FS will 1) provide watersheds supporting conservation populations of westslope cutthroat trout with the level of protection necessary to ensure their long-term persistence; 2) defer any new federal land management action if it cannot be modified to prevent unacceptable aquatic/riparian habitat degradation; and 3) maintain westslope cutthroat trout habitat at 90% of optimum habitat conditions. When this 90% of optimum condition criteria is not met, only activities resulting in habitat improvement are to be considered. The Strategy also states that FS Biological Evaluations (FSM 2670) prepared for new activities should, in most cases, conclude that there will be a beneficial effect or no effect to the westslope cutthroat trout population or its habitat. The Strategy has also been adopted for Yellowstone cutthroat trout, which occupy some streams in the project area

Chapter 2.0 Alternatives Including the Proposed Action

2.1 Contents of Chapter

Chapter 2 contains documentation of the relevant issues that were identified during the scoping process, the description of the proposed action, alternatives to the proposed action that were formulated based on the environmental issues, issues and alternatives eliminated from detailed evaluation, and a table summarizing the environmental effects associated with each alternative.

2.2 Scope of the Environmental Analysis

To help define the geographic and temporal scope of this analysis 50 letters were sent to a variety of organizations, local grazing permittees, Montana Fish Wildlife and Parks and other members of the public. Five responses were received from the scoping process.

An interdisciplinary team (ID Team) composed of natural resource specialists reviewed these letters. The ID Team identified the relevant issues with the help of the deciding official. These issues were then used to identify needed mitigation and modify the proposal to reduce adverse effects and increase beneficial effects.

2.3 Issues Eliminated From Detailed Study

An essential part of the environmental analysis process is to identify those issues that are relevant to the project being evaluated and those that are not relevant. It is the job of the ID Team in consultation with the deciding official (District Ranger) to complete this step.

One potential issue identified was the possibility for conflicts between this proposal and the ongoing Forest Travel Planning process. To eliminate this issue only those roads and trails not selected for use under any of the alternatives the Travel Plan have been selected for decommissioning or obliteration. Therefore, this issue was determined to be not relevant.

2.4 Relevant Issues from Federal, State, Local Government, and Public Involvement

The Interdisciplinary Team with consultation of the District Ranger reviewed the issues identified during scoping. Issues that were determined to be relevant to the analysis were identified. These are used in Chapter 3 to evaluate the environmental effects.

Issue #1: Ground-disturbing activities associated with decommissioning or obliterating sections of roads could affect water quality.
Discussion: Proposed decommissioning activities would involve the use heavy equipment. This equipment would be used to move soil, rock, rip road surfaces, and place downed wood. The equipment would also be used to remove culverts. While the culvert is being removed and the stream banks reshaped to their natural grade, some sediment would be deposited directly in the stream.
Indicator to describe effects: Predicted tons of sediment increase or decrease calculated from the R1R4 Sediment Model (Cline et. al. 1981)

Issue #2: Ground-disturbing activities associated with decommissioning or obliterating sections of roads could affect terrestrial and aquatic plant and animal life including threatened, endangered, and sensitive and management indicator species.
Discussion: Heavy equipment used to accomplish the proposed work could disturb wildlife. Proposed decommissioning activities described under Issue #1 could affect fish and other aquatic life by increasing sediment. Increased sediment

could cause damage to spawning areas, and smother fish eggs and newborn fry.
Indicator to describe effects: Qualitative and quantitative discussions of predicted impacts on various species, i.e.;

-Sediment impacts on fish and amphibian habitat and populations resulting from treatments and associated activities

-Impacts to riparian areas and stream channel form and function resulting from project treatments and associated activities

-Direct impacts of project treatments and associated activities on fish and amphibian habitat and populations

-Watershed hydrologic changes and subsequent impacts on fish and amphibian habitat and populations due to treatments and associated activities.

2.5 Alternative Development Process

Issues received from the public and issues identified by the ID Team were used to modify the proposal sent out to the public during scoping. The modifications are designed to refine the proposal, reduce the potential for adverse environmental effects, and increase beneficial effects.

2.6 Alternatives Eliminated From Detailed Study

Because of the numerous roads in the area, any number of configurations of roads could have been evaluated for decommissioning under various alternatives. However, two important factors helped the ID Team decide which roads to propose for treatment. The first factor is that watershed rehabilitation is the emphasis behind this project. Therefore, those drainages with the highest potential for road-related resource problems were high priority. Willow and Bangtail drainages both contain populations of cutthroat trout therefore they were highest on the list to be completed. The second factor is the ongoing Forest Travel Planning process. Over the past year and half the Forest and the public have reviewed every road and trail on the Forest to decide which roads and trails to keep open and which to gate, decommission or obliterate. This limited the discretion that the ID Team had in choosing which roads to treat under this proposal. No alternative was proposed that potentially precluded implementing any of the alternatives in the Travel Plan.

One alternative identified only roads and trails needing to be decommissioned or obliterated in the Willow Creek and Bangtail Creek drainages because of their populations of Yellowstone cutthroat trout. Yellowstone cutthroat trout is a sensitive species in Region 1 of the Forest Service and has been petitioned to be listed as a threatened species under the Endangered Species Act. Some of the roads in these drainages are a priority for treatment because of the increased levels of sediment they contribute to the streams. Only treating these two drainages was eliminated because it was determined by the ID Team that it would be more cost effective and environmentally favorable over the long-term to complete the analysis of the environmental effects of road decommissioning across the entire Bangtail Mountains area. Therefore, implementing rehabilitation of roads on only the Willow and Bangtail drainages was eliminated.

One alternative proposed closing more roads than what is proposed. The ID Team decided this would be premature in light of the ongoing Travel Plan analysis and therefore was not evaluated in detail. If more roads are determined to need decommissioning in the future, additional environmental analysis could be completed.

2.7 Detailed Description of Alternative A (No Action)

The no action alternative is required to be evaluated under the National Environmental Policy Act (1969). It is used as a basis for comparison of the other alternatives. Under the No Action alternative, no road decommissioning or obliteration of trails would take place.

Activities that currently occur on those roads and trails that are legally sanctioned would continue. This includes public travel with motor vehicles on those routes that are designated open to motor vehicles. This alternative would defer any decommissioning of roads and trails until some later date. Timing of that work would depend upon which alternative is chosen in the Travel Plan Decision and when the Forest could get around to completing the required environmental analysis and documentation. However, Alternatives 2 through 7 in the Travel Plan would include some level of road decommissioning in this area. At a minimum, it would propose that all the roads included in this proposal be decommissioned but it is possible that it could propose to decommission more roads than what are proposed in this project.

2.8 Detailed Description of Alternative B (Proposed Action)

Alternative B proposes to decommission 46.6 miles of roads and 1.2 miles of non-system user built ATV trails that are not part of the Forest transportation system and not included in any of the alternatives in the proposed Travel Plan. Appendix 2 contains a list of those activities that would occur on each road proposed for treatment. Appendix 2 also contains a map with a numbered cross-reference to the list of proposed activities.

Alternative B would include:

- Ripping of roads surfaces where needed to restore infiltration of water into road surface and to help reestablish vegetation
- Felling or pushing over a few trees as needed to provide downed woody debris to reduce erosion and to block roadways to vehicles
- Placement of rock as needed to block vehicle use and prevent erosion
- Recontouring short distances of the road if needed to block vehicles and reestablish water infiltration and subsurface water flow.
- Seeding with native seed mix to reestablish vegetation on road surfaces where little vegetation exists
- Placement of downed woody debris to reduce erosion, establish vegetation and block vehicles
- Removing culverts to reestablish unrestricted stream flows
- Reshaping and hardening of stream banks where culverts are removed. Coir matting or other materials may be used to reestablish vegetation and reduce erosion into streams at these points
- Decommissioning would last 1-3 years.

For the purposes of evaluating environmental effects, the area has been divided into 6th order Hydrologic Units (NRCS 2004). These are listed below in Table 2. Hydrologic Units for Bridger

Table 2.1. Road Densities Before and After Implementation. This table displays the road densities before and after treatment for each 6th order Hydrologic Unit.

Name of 6th Order Hydrologic Unit (HUC)	Square Miles of Forest Land Area within HUC	Before		Proposed Treatment	After	
		Total Miles of Road on Forest in HUC*	Miles of Road per Square Mile of Forest	Total Miles of Roads on National Forest to be Treated	Total Miles of Road on National Forest in HUC*	Miles of Road per Square Mile of Forest
Bangtail Creek	6.8	37.0	5.4	17.2	19.8	2.9
Brackett Creek	0.1	1.0	10.0**	0.7	0.3	3.0
Bridger Creek	1.0	2.0	2.0	0.0	2.0	2.0
Jackson Creek	4.5	25.0	5.6	10.3	14.7	3.3
Perkins Creek	1.5	6.0	4	2.4	3.6	2.4
Willow Creek	6.0	34.0	5.7	18.1	15.9	2.7

*Acres and miles rounded to the nearest whole number.

and Brackett Creek have minimal miles of roads to be decommissioned and are therefore not evaluated in detail (Chapter 3.2)

2.8.1 Project Design Features, Mitigation and Monitoring

The following list are those actions that would be followed to implement the project. These are designed to reduce adverse environmental effects and facilitate the implementation of the project. These have been used successfully across the Forest for several years for other road decommissioning and obliteration trail projects. All of the following activities are currently funded in the fiscal year 2006 budget. Weed suppression has consistently been funded over the last several years and noxious weeds and invasive species are identified and one of the top priorities of the Forest Service.

Mitigation:

1. Conduct all work in a manner such that the result is as visually appealing as is practical. Responsible Official: Forest Landscape Architect, and Contracting Officer's Representative

2. The Montana Department of Fish Wildlife and Parks in accordance with the Montana Stream Protection Act is reviewing this project. Prior to culvert removal or any activities that involve direct disturbance to streams, all Streamside Protection Act 124 Permits would be acquired. Some of the permit requirements would be as follows. Responsible Official(s): Contracting Officer's Representative, Forest Hydrologist:

    - All in-stream work would be completed in an expeditious manner to avoid unnecessary impacts to the stream;
    - Extra precautions would be taken to preserve existing riparian vegetation;
    - All construction activities performed in the stream and immediate vicinity would be conducted in a manner to reduce in-stream turbidity along with minimizing disturbance to the streambed an/or banks of the stream;
    - All stream bank and adjacent areas disturbed by the construction activity would be protected with temporary erosion control measures. These areas would be reclaimed with long-term erosion control measures and revegetated immediately after construction;
    - The excess material and supplies would be placed in a area where they would not damage vegetation or cause erosion or sedimentation after their removal or prior to their use;
    - Work would be completed as outlined in the plans submitted with the permit application and as discussed on site.

3. Use native materials such as downed logs, slash, rock, and soil to close roads to motor vehicles. Responsible Official: Contracting Officer's Representative

4. Use a native weed-free seed mix wherever areas are reseeded to reestablish vegetation. Responsible Official(s): Contracting Officer's Representative and Gallatin Invasive Species Coordinator.

5. Conduct weed suppression prior to the decommissioning work and schedule follow-up weed suppression. Follow weed management practices in FSM 2080. For instance, all contractor equipment would be washed to remove weed material and weed seeds prior to coming onto the Forest and beginning work. Responsible Official(s): Contracting Officer's Representative, Gallatin Invasive Species Coordinator and District Invasive Species Coordinator

6. Occasionally, a live or dead tree would be pushed over or felled to facilitate the effective decommissioning of a road. These would be smaller intermediate or suppressed trees that do not contribute to the main canopy of the adjacent forest. Responsible Official: Contracting Officer's Representative.

7. Rip road surfaces where it appears ripping would help restore hydrologic function. If road surfaces are not eroding and have grown in with grasses, trees, or brush they would not be ripped. Responsible Official: Contracting Officer's Representative

8. Inspect each road length prior to beginning work to make sure no vehicles get trapped behind the decommissioning work. Responsible Official: Contracting Officer's Representative

9. For public safety, work areas would be signed disclosing the operation of heavy equipment. Responsible Official: Contracting Officer's Representative

10. Conduct work during the drier months of the summer. Contracting officer's representatives would determine those times when conditions are too wet to operate. Contract clauses restricting operations to drier days would be included in the contract. Responsible Officials: Contracting Officer's Representative and the Forest Contracting Officer

11. The decommissioning would be accomplished through a contract using an excavator or dozer to rip or recontour road surfaces, remove culverts and reshape stream banks. Responsible Officials: Contracting Officer's Representative, the Forest Contracting Officer and the District Ranger

12. To reduce the potential for disturbance of nesting goshawks, schedule the use of heavy equipment after either August 1 or at least ½ mile away from potential nesting habitat. Responsible Officials: Contracting Officer's Representative and the District Wildlife Biologist

13. Road decommissioning activities would be coordinated with livestock permittees in the area to eliminate conflicts with livestock and the potential for access problems to allotment improvements. Responsible Officials: Contracting Officer's Representative and Rangeland Management Specialist

14. Prior to pushing over any trees, they would be inspected for cavity nesting wildlife species. Responsible Official: Contracting Officer's Representative

15. No ground disturbance or use of heavy equipment would occur in wet areas such as seeps, springs or bogs. The exception to this would be those areas where roads crossed these areas and where culverts are removed. These areas would be rehabilitated. Responsible Official: Contracting Officer's Representative

16. The Bangtails have had past surveys for cultural resources. None of the proposed decommissioning would affect any known sites. A special provision would be included in the contract that would require the equipment operator to stop work if a site is encountered. The site would then be avoided.

Monitoring:

1. Inspect each decommissioned or obliterated road for weeds each year for a period of no less than five years and conduct weed suppression as needed.

   Funding: Monitoring and suppression of weeds would be funded annually with weed suppression funding. These dollars have historically been available on an annual basis would continue to be available in the foreseeable future. It is the responsibility of the Forest Invasive

Species Coordinator to allocate dollars each year to the Districts for weed suppression programs. Noxious weeds are identified as a national priority for the Forest Service.

2. Inspect contract work with certified contracting officer representatives.

   Funding: Dollars required to accomplish the contract inspection have been set aside. The Forest Hydrologist is responsible for seeing that the work is accomplished according to standards.

3. Decommissioning work would be inspected for the first three years after the work is completed to assess the level of success with stopping vehicle use, reestablishment of hydrologic function and growth of seeded grasses.

   Funding: Money to accomplish this task would be allocated each year in the Watershed Budget for the Forest Hydrologist

2.9 Comparison of Alternatives

Table 2.3. Comparison of Alternative. This table briefly summarizes the effects of each alternative

Issue	Alternative A - No Action	Alternative B
Issue #1: Ground-disturbing activities associated with decommissioning or obliterating sections of roads could affect water quality.	Bangtail Creek and Willow Creeks would be in excess of the 30 percent over natural standard at 44 and 45 percent respectively. Perkins Creek would continue to meet the standard.	Sediment standards would be met in all drainages. Short-term localized sediment increase could occur from proposed activities. Mitigation is expected to quickly reduce sediment to below pre-treatment levels. Eventually, the reestablishment of vegetation would reduce sediment levels to 0-5 percent of untreated and native surfaced roads. Therefore, Alternative B results in sediment standard compliance for all streams.
Issue #2: Ground-disturbing activities associated with decommissioning or obliterating sections of roads could affect terrestrial and aquatic life including threatened, endangered, sensitive and management indicator species.	No affect on grizzly bear, gray wolf, and bald eagle. For the Canada lynx Alternative A is not consistent with the guideline to reclaim or restrict travel roads where road densities exceed 2 miles per square mile. There would be no affect on most sensitive species. However, Yellowstone cutthroat trout habitat would not improve because of continued high sediment levels. Elk would continue to experience degraded habitat. Alternative A provides access for weed treatment. Weeds would continue to be treated but exposed road surfaces would also continue to provide areas for establishment and a vector for weed dispersal.	No affect on grizzly bear, gray wolf and bald eagles, may affect but not likely to adversely affect the Canada lynx. Mitigation and project design features reduce adverse effects on sensitive species to within acceptable levels. Yellowstone cutthroat trout habitat would improve to within the standards. Elk habitat would improve and continue to get better as forest cover reestablishes. More difficult and costly to treat weeds but long-term reestablishment of vegetation would reduce available sites for weed establishment.

Chapter 3.0 Affected Environment and Environmental Consequences

3.1 Contents of Chapter

This chapter contains information related to the current environmental conditions (affected environment) and the direct, indirect and cumulative beneficial and adverse environmental consequences of implementing the alternatives. Environmental consequences include the direct, indirect and cumulative effects of Alternatives A and B.

There are no unique characteristics of the area such as prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas. There are no significant historic or cultural resources.

3.2 Water Resources

Issue #1: Ground-disturbing activities associated with decommissioning or obliterating sections of roads could affect water quality.

The Bangtail Mountains are moderately dissected with several small drainages including tributaries to Cache Creek, Nixon Creek, Horse Creek, Pony Creek, Weasel Creek, Skunk Creek, Miles Creek, Canyon Creek, Grouse Creek, Bridgeman Creek, Bangtail Creek, Willow Creek, Jackson Creek, Stone Creek, White Creek, and Olson Creek. For the purposes of evaluating environmental effects, these drainages have been aggregated into 6th order Hydrologic Unit Classifications (Appendix 1, Figure 2).

Average annual precipitation varies from about 25 inches near the lower elevation at the Forest Boundary to about 35 inches at Grassy Mountain. The percent of the average annual precipitation that falls as snow varies from 40 percent to about 50 percent. Rainfall intensity is moderate. Water yield varies from about 0.7-acre feet/acre at 6000 feet to about 0.9-acre feet/acre at 7600 feet. This represents an average of about 30 percent precipitation to runoff efficiency.

Very limited water quality data is available for the Bangtails. Most of the Bangtail Mountains have moderate natural sediment yields. Soils in the Bangtails have medium textured surface layers, and an accumulation of clay in the subsoil with 5 to 50 percent rock fragments in the subsoil. Soil erosion potential is generally moderate with moderate sediment deliver efficiency, and low risk of landslides (USFS, 1996). Total sediment yields have been measured in Stone Creek at 42.1 and 39.5 tons/mi2/year which was used to approximate sediment yield of 40 tons/mi2/year used in the sediment modeling.

Stream channels are fairly steep with narrow channels (Channel types A2, A3, B2, and B3, Rosgen, 1996) with fair to good streambank stability (Pfankuch, 1975, Stream Reach Inventory and Channel Stability Evaluation, USFS, R1). Steam composition is generally gravel/cobble/small boulder with some lower gradient, finer textured depositional sections on the larger streams near the Forest Boundary (Stone and Jackson Creeks). Livestock grazing particularly in lower Bangtail Creek, lower North Fork and Middle Fork of Willow Creek, and parts of Jackson Creek affect sections of lower gradient Bangtail streams.

Much of the Bangtail range was roaded and logged in the 1980's and up to the mid-1990's before completion of the BSL land exchange. Since 1999 very little commercial timber harvesting has occurred on National Forest lands on the east side of the range. An evaluation of aerial photos, Gallatin NF timber sale records, and BSL harvesting information indicates that timber harvest included about 200 acres in Bangtail Creek by 1980 and an additional 245 acres by 1988. Willow Creek timber harvest included about 300 acres by 1980, an additional 677 acres by 1988, and 278 acres by 1998. Jackson Creek timber harvest included about 1050 acres by 1980, an additional 600 acres by 1988, and 598 acres by 1998. Existing road mileage in the National Forest portion of the drainages where most of the

road decommissioning is proposed includes approximately 37.3 miles in Bangtail Creek, 34.1 miles in Willow Creek, and 24.5 miles in Jackson Creek. Sediment yield effects of the roads varies widely.

Erosion and sediment from roads are increased by compacted surfaces, decreased infiltration, increases in surface runoff during storm events, and surface erosion of the road prism and land areas below road drainage outlets. Several of the primary access roads are sediment sources that could be reduced with additional drainage.

Most of the acquired BSL land roads do not receive much public motorized travel and are in various states of vegetative recovery. Many of the road segments have revegetated since completion of timber harvesting in the 1980's and 1990's and would require little or no treatment except for culvert removal and installing additional erosion ditches to channel water off road surfaces. The roads are eroding in a few areas and are sediment sources. These road segments, not needed for the road or trail network in the Travel Plan, would be treated by recontouring or ripping, seeding, culvert removal, and slashing.

The State of Montana Water Quality Act (MCA) 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 Montana Department of Environmental Quality has designated all non-wilderness surface waters in the project area as B1 Classification. Waters classified as B1 must be suitable for 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. All surface waters within the Bangtail Range are classified as B1. No known water quality violations of Montana B-1 numerical standards (which apply to the entire area) occur.

The Gallatin Forest Plan implementation guidelines identify streams as either Category A or B. Category A streams contains sensitive species and/or Blue Ribbon fisheries. All other streams are classified as Category B. Allowable substrate sediment and sediment delivery by Forest Categories A and B are incorporated into these implementation guidelines (Table 3.1).

Table 3.1. Stream Sediment Standards. This table displays the sediment standards for Forest Plan Category A and B streams.

Category of Stream	***Management Objective (percent of reference conditions*)***	***Percent Fine Substrate Sediment Allowed (less than 6.3mm in size)***	***Annual Percent Sediment Delivery Allowed above Reference conditions*****
Category A Sensitive Fish Species and/or Blue Ribbon fisheries	90%	0 – 26%	30%
Category B All other streams (formerly Classes B, C, D)	75%	0 – 30%	50%

*% of reference = % similarity to mean reference condition
**Reference = observed relationship between substrate % fines and modeled sediment delivery in reference (fully functioning) GNF watersheds.

Bangtail and Willow Creeks are Category A streams since they contain Yellowstone cutthroat populations. Perkins Creek is also a Category A stream since it is tributary to Fleshman Creek which has Yellowstone cutthroat trout. Jackson Creek is not a cutthroat fishery and is a Category B stream.

No Water Quality Limited 303(d) listed stream segments occur in the project area. The Montana DEQ 303(d) list includes the main stem of Bridger Creek (18.4 miles) from the headwaters to the confluence with the East Gallatin River but has not been assessed for beneficial use support. A 20.3 mile segment of the Shields River, from the confluence with Cottonwood Creek to the Yellowstone River, is listed as partially supporting aquatic life, cold water fishery and primary contact recreation. Probable causes include bank erosion, dewatering, flow alteration, riparian degradation, and siltation from agriculture, grazing, hydro-modification, and flow regulation/modification. These causes are due primarily to agricultural activities along the Shields River. Bangtail and Willow Creeks are tributaries to the listed Shields River segment about 12 miles downstream. The Shields River TMDL plan, being developed by the Montana DEQ scheduled for completion in 2006 would prescribe sediment reduction practices for agriculture, road decommissioning on National Forest lands in the Bangtails, improved road and trail drainage, and road surfacing in the Crazy Mountains (upper Shields River).

Sediment yield were evaluated using the R1R4 sediment model (Cline et.al., 1981) and adjusting sediment coefficients based on existing road and timber harvest unit conditions. The sediment model was run in a cumulative fashion accounting for all existing roads, timber harvesting, and residential, and recreational developments in four Bangtail watersheds to the Forest Boundary. Total sediment yields have been measured in Stone Creek at 42.1 and 39.5 tons/mi2/year which was used to approximate baseline sediment yield of 40 tons/mi2/year. The routing of sediment and water through the main channel is limited to broad-based regional curves as no main channel hydrologic or hydraulic processes are modeled directly. The four primary watersheds where treatments are proposed were evaluated with the R1R4 model (6th order hydrologic units to the Forest boundary).

The R1R4 model used in the sediment analysis is designed to address the cumulative effects of timber harvest operations, road construction, and fire. The model does not attempt to analyze the effects of grazing and mining activities (other than vegetation removal and road construction) or individual episodic storm events. The model is designed to compare relative differences among

Table 3.2. Sediment Yields. This table displays the estimated tons of sediment and the percent of sediment yield for the existing condition (Alternative A) and the proposed action (Alternative B) by 6th order hydrologic unit.

		Alternative A			***Alternative B***		
Drainage	***National Forest Acres within 6th HUC****	***Existing Road Miles***	***Existing Sediment tons/year***	***Existing Sediment % over Natural***	***Post Treatment Road Miles***	***Post Treatment Sediment tons/year***	***Post Treatment Sediment % over Natural***
Bangtail Creek	4323	37.3	318	44	20.1	277	23
Jackson Creek	2882	24.5	196	43	14.2	171	25
Perkins Creek	972	5.8	72	30	3.4	65	18
Willow Creek	3814	34.1	253	45	16.0	210	21

*6th HUC means the 6th order Hydrologic Unit Classification.

alternatives rather than to predict precise sediment and water yields that are likely to occur upon project implementation. Because the R1R4 model relies on climatic conditions averaged over long periods, the model's accuracy is best when averaged over several years. The model is less reflective of individual drought or flood years. The R1/R4 Sediment model focuses on slope processes and estimates the water and sediment delivered to the main channel by forest management within the watershed, including the headwater stream channels.

Under Alternative A in Table 3.2, the sediment analysis for existing road miles indicates that both Bangtail Creek and Willow Creeks are in excess of the 30 percent over reference (natural) standard for Category A streams. Perkins Creek is also a Category A stream since it is a tributary to Fleshman Creek, which has Yellowstone cutthroat trout in the lower 8 miles. Bangtail Creek and Willow Creek, at 44 percent and 45 percent over natural respectively, exceed the 30 percent over natural guideline. The R1R4 model indicates that Perkins Creek is currently at the sediment standard. Implementation of Alternative A (No Action) would result in sediment levels continuing at the current levels.

The modeling results indicate the road reductions in Alternative B would reduce sediment levels to well within compliance in all four drainages. During initial treatments, such as ripping, culvert removal, and especially recontouring, a small and localized sediment increase could occur. However, mitigation includes the construction of erosion ditches (water bars), slashing, and ripping of roads surfaces as needed to improve water infiltration. These measures are expected to quickly reduce sediment to below pre-treatment levels. In addition, as vegetation reestablishes itself (from reseeding of native grasses and the natural reestablishment of grass, forbs, and shrubs) sediment levels would be reduced to 0-5 percent of untreated and native surfaced roads. Therefore, Alternative B results in sediment standard compliance for Bangtail Creek, Willow Creek, and Perkins Creek. The R1R4 sediment model analysis estimates that after treatment sediment yields would be reduced to 23 percent over natural in Bangtail Creek, 25 percent over natural in Jackson Creek, 18 percent over natural in Perkins Creek, and 21 percent over natural in Willow Creek.

Actual reductions in sediment would depend vary slightly depending upon the exact amount of area disturbed by equipment and the time it takes for vegetation to reestablish in those disturbed areas. Placement of slash, construction of erosion ditches, and rehabilitation of areas where culverts are removed would facilitate the watershed's response to the decommissioning of these roads and trails.

Effects of Alternative B on water yield are very minor. Existing estimated average annual water yield increase above baseline averages about 3.5 percent for the Bangtails area. Road treatments would be expected to reduce water yields slightly as revegetation slightly increases transpiration amounts. After 10 plus years some of the treated road surfaces would begin to serve as bedding areas for Douglas-fir and lodgepole pine regeneration which would slightly further reduce water yields as the new trees transpire more water. The primary variable in water yield would be reforestation of harvested units that would reduce water yield. None of the water yield changes are sufficient enough to be measurable with conventional stream gauging equipment.

Cumulative Effects: Past activities, contributing the most sediment to area streams includes road construction, logging, and livestock grazing. Current activities, such as those occurring under Alternative A, include the continued contribution of sediment from roads, and livestock grazing. There are no logging projects proposed on National Forest lands in the foreseeable future. Logging is expected to continue on adjacent private lands as is the sale and subdivision of areas of private lands for housing developments. Alternative A would be expected to contribute unacceptable levels of sediment over the long term. Cumulative effects related to implementation of Alternative B include a

reduction in sediment yields over the long term even when other potential activities such as subdivisions are considered. Overall, decommissioning roads is a common practice and does not involve unique or unknown risks to the aquatic environment.

3.3 Wildlife Resources

Issue #2: Ground-disturbing activities associated with decommissioning or obliterating sections of roads could affect terrestrial and aquatic plant and animal life including threatened, endangered, and sensitive and management indicator species.

There is an abundance of law, policy and direction applicable to wildlife habitat considerations relative to resource management on National Forest lands. 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 process for listed species. The National Forest Management Act (NFMA) of 1976 requires that the US Forest Service maintain sufficient habitat to sustain viable populations of native species. The National Environmental Policy Act (NEPA) of 1969 requires an assessment of the impacts of human activities upon the environment. Forest Service Manuals (FSM 2670) provide policy under which Forest Service projects are designed to maintain viable populations of sensitive species and to ensure that those species do not become threatened or endangered due to Forest Service actions. Ultimately, the Gallatin Forest Plan provides specific direction for management of wildlife habitat by various management emphasis areas (MAs).

Threatened and Endangered Species

There are four species listed as threatened or endangered on the Gallatin National Forest; grizzly bear, gray wolf, bald eagle and Canada lynx. Gray wolves on the Gallatin Forest are considered part of a nonessential, experimental population that extends outside Yellowstone National Park.

Grizzly bears, Gray Wolves and Bald Eagles: Grizzly bears and gray wolves are not currently known to occupy habitat in the Bangtail Mountain Range. Road decommissioning would not adversely affect habitat or prey base in the project area, so there is no concern for how the proposed action might affect potential future use of the area by these species. Bald eagles occasionally fly over the project area, but there is no suitable nesting habitat in the Bangtail Range, and no fishable streams with good perch trees within or near the project area. Big game winter ranges that might provide ungulate carcasses as a food source for bald eagles are located on private land well outside the project area. Further, bald eagle use of big game carcasses would most likely occur during winter or spring, and not when project activities are scheduled to occur. Based on these factors, it has been determined that the both Alternative A (no action) and Alternative B (proposed action) would have no effect on grizzly bears, gray wolves or bald eagles.

Canada Lynx: The Canada lynx was listed as a threatened species under the ESA in March 2000. The lynx is a medium sized wildcat associated with forested environments. Lynx require a range of habitat conditions for survival and reproduction. Forest cover is preferred for travel, resting and hunting. Foraging habitat is that which is most likely to support year-round use by the lynx's primary prey species, snowshoe hare. Snowshoe hares select densely stocked forest stands with a high proportion of horizontal cover within approximately ten feet of the ground (Hodges 2000). Optimal snowshoe hare habitat in the project area is best represented by densely stocked sapling to pole age stands, primarily resulting from timber harvest within the past 15-20 years. Denning habitat for lynx is typically found in mature forest stands that produce large amounts of down woody material in the form of large logs and root wads (Ruediger et al. 2000). In general, lynx habitat on the Gallatin National Forest is defined as moist, coniferous forest in the elevation range between 6,000 and 8,800 feet with habitat types where spruce or subalpine fir are the indicated climax species. Moist Douglas-fir intermingled with subalpine forest habitat types is also considered lynx habitat. The project area

contains lynx habitat and is located in the Bridger/Bangtail Lynx Analysis Unit (LAU).

Neither Alternative A nor B would alter existing lynx foraging or denning habitat. Most roads targeted for decommissioning are associated with past timber harvest, and thus are located in areas that either currently provide lynx foraging habitat, or are expected to grow into lynx foraging habitat in the near future. Alternative A would leave road corridors through lynx foraging habitat, while Alternative B would facilitate conifer seedling growth on the roadbed, which could reduce fragmentation of potential future foraging habitat. The effects of either scenario are not clear, since there is little information available on the impacts of roads and trails on lynx or their prey. In some circumstances, lynx use existing roadbeds for travel and foraging (Ruediger et al. 2000). Lynx frequently travel riparian corridors, and hunt along dense riparian vegetation (Ruediger et al. 2000). Under Alternative A, continued sedimentation due to runoff from existing roads and trails could further impact water quality and eventually lead to increased degradation of riparian habitat in the LAU. Alternative B would improve riparian habitat conditions over time.

It is possible that road and trail use during the lynx reproductive period could have adverse impacts if lynx are forced to move kittens due to human disturbance (Ruediger et al. 2000). Under alternative A, some roads and trails would continue to receive motorized vehicle use, although at very low levels, during the lynx denning season. Disturbance associated with incidental use of project roads identified for decommissioning is almost a moot issue, since use levels are low and alternate routes nearby would remain open to motorized use in either Alternative. Under Alternative B, road decommissioning would occur during the lynx reproductive season, which could have considerable disturbance impacts during the lynx denning season. This project could produce disturbance effects for up to three consecutive seasons.

Road and trail corridors can facilitate human access into lynx habitat in winter, and snow compaction from human winter travel could theoretically allow competing predators into lynx habitat (Ruediger et al. 2000). Under Alternative A, road corridors would remain in place longer even if motorized use were restricted since soil compaction on existing road surfaces would inhibit vegetation growth. Under Alternative B, treated road corridors would grow in more quickly, and the process of conifer regeneration accelerated.

Direction for managing lynx habitat is contained in the Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000). The LCAS contains the following Programmatic planning - guideline applicable to the Bangtail road decommissioning project:

"Determine where high total road densities (> 2 miles per square mile) coincide with lynx habitat, and prioritize roads for seasonal restrictions or reclamation in those areas" (LCAS:7-10)

Alternative A would not be consistent with LCAS direction, whereas Alternative B would.

Cumulative effects: Cumulative effects to lynx and their habitat in the project area are primarily the result of past timber harvest and associated road networks, high levels of recreation use, livestock grazing and land consolidation adjustments. Past timber management activities produced disturbance during harvest operations, which likely occurred throughout the lynx denning season. On the other hand, timber harvest in the project area has produced a landscape pattern where regenerating harvest units combined with remnant mature and old growth stands result in a good distribution of lynx foraging and denning habitat.

The extensive road network in the project area has provided some motorized recreation opportunities after harvest operations were complete, although not all roads used for harvest currently receive public use. Timber harvest units and road corridors through remaining mature timber provide opportunities for winter recreation. Human travel in winter can result in snow compaction, which could negatively affect the lynx's natural competitive advantage over generalist predators in deep snow conditions.

Livestock grazing has had impacts on riparian habitat in the project area. These impacts could affect cover and hunting opportunities for lynx. The Gallatin Land Consolidation Act of 1998 consolidated much of the project area into public ownership, which minimized the potential for permanent habitat loss through housing development. However, while considerable lynx habitat was acquired on the east side of the Bangtails where this project is proposed, the west side of the range was consolidated into private ownership, which significantly facilitates housing development in that area of the LAU.

In summary, the Bangtail range is a somewhat isolated mountain range with marginal lynx habitat, and is part of the much larger Bridger/Bangtail LAU. While the LAU contains limited lynx habitat relative to the rest of the Forest, it is considered a key linkage area in providing for habitat connectivity in this part of Montana. Some of the proposed action is located within lynx habitat, and there is potential for disturbance effects during the lynx denning season (May through August). On the other hand, the project has potential to benefit lynx by reducing water quality impacts and thereby improving riparian habitat conditions, reducing motorized disturbance impacts in some areas near lynx denning habitat, and possibly reducing road corridors that provide access routes for winter recreation. The proposed action (Alternative B) meets the intent of the LCAS by reducing excessive road densities in lynx habitat, whereas taking no action (Alternative A) would not address this concern. Based on these factors, it has been determined that the proposed action may affect, but is not likely to adversely affect lynx or their habitat.

This project meets direction contained within the LCAS and is therefore covered under the "Programmatic Biological Assessment for activities that are not likely to adversely affect Threatened and Endangered Terrestrial Species" (2005).

3.3.1 Sensitive Species

Sensitive species are those plant and animal species identified by a 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). The sensitive species program intends to be pro-active by identifying potentially vulnerable species and taking positive action to prevent declines that result in listing under the Endangered Species Act.

Forest Service Manuals (FSM 2670) provide policy under which Forest Service projects are designed to maintain viable populations of sensitive species and to ensure that those species do not become threatened or endangered due to Forest Service actions. As part of the National Environmental Policy Act (NEPA) decision-making process, proposed Forest Service programs or activities are to be reviewed to determine how an action would affect any sensitive species (FSM 2670.32). The goal of the analysis should be to avoid or minimize impacts to sensitive species and if impacts cannot be avoided the degree of potential adverse effects on the population or its habitat within the project area and on the species, as a whole needs to be assessed.

Sensitive terrestrial wildlife species on the Gallatin National Forest include; trumpeter swan, harlequin duck, black-backed woodpecker, peregrine falcon, flammulated owl, northern goshawk, wolverine, and western big-eared bat. A report evaluating the environmental impacts on wildlife has been prepared for this project. Detailed descriptions of those effects are contained in the project file. Following is a summary of the findings in that report.

Trumpeter Swan and Harlequin Duck: There is no suitable habitat present within the Bangtail

Mountain range for trumpeter swans or harlequin ducks. Therefore, both Alternative A and Alternative B would have no impact on these species, so these species are not discussed further in this report.

***Black-backed Woodpecker**:* Since there is no suitable nesting habitat present, any foraging by black-backed woodpeckers in the project area would be incidental. Therefore, it has been determined that both Alternative A and Alternative B would have no impact on black-backed woodpeckers.

***Peregrine Falcon**:* The project area is not currently known to be used by peregrine falcons. Alternative A would have no impact on peregrine falcons. There are no adverse impacts to foraging habitat expected to result from Alternative B. Therefore, it has been determined that the proposed action would have no impact on peregrine falcons.

Flammulated Owl: Alternative A would have no impact on flammulated owls. Under Alternative B, very few of the proposed treatment sites are located in open mature forest habitat. Flammulated owls are cavity nesters, and appear to be very tolerant of human activity. They are often found nesting in or near human occupied areas. Nest abandonment is rare for this species (McCallum 1994). Young owls typically fledge by mid July, so project activities later in the season should have negligible impacts. Since standing trees on site may be felled to provide slash for road surface treatment, it is possible that suitable or even occupied nest trees could be damaged or removed. Mitigation Included in Chapter 2.8.1 would mitigate this potential effect. Foraging habitat would not be adversely modified by the proposed treatment, and flammulated owls are highly nocturnal, so foraging is unlikely to be disrupted by project activities. Based upon the above discussion, it has been determined that Alternative B may impact individuals or habitat, but would not lead to a trend toward federal listing of flammulated owls.

Northern Goshawk: A member of the accipiter family of forest hawks, the goshawk is dependent on forested habitat for nesting, fledging and foraging habitat. On the Bozeman Ranger District, goshawk nest sites are typically found at lower elevations (less than 7,500 feet) in mature to old growth, closed-canopy Douglas-fir, lodgepole pine and spruce/subalpine fir types on gentle to moderate slopes. Minimum patch size for goshawk nest sites is 25 acres, with a patch of at least 125 acres considered to be optimal (Warren 1990). Younger forests (pole-size and larger trees), including small openings, can provide suitable foraging habitat. Goshawks typically occupy a home range of approximately 6,000 acres during the nesting season. The home range includes nesting, post-fledging and foraging habitat and may include a variety of successional stages (Reynolds et al. 1992). Suitable nesting habitat is provided by mature to old growth forest within the project area. There are no known active goshawk nest sites within the project area, although specific surveys have not been conducted for this project. In 2002, goshawk surveys were conducted in the Grouse Creek part of the project area for a proposed fuel reduction project. No nesting goshawks were detected through those surveys.

Alternative A would have no impact on northern goshawks. Under Alternative B, the proposed action would not adversely modify goshawk nesting or foraging habitat. However, heavy equipment noise and increased human presence during the nesting season could have disturbance effects on goshawks. Disturbance effects that occur early in the nesting season (May or June) could result in nest abandonment and reproductive failure for an individual pair. Disturbance during the nestling or fledgling period (June-July) could disrupt parental foraging patterns and have physiological impacts on adults and young birds associated with stress. As young birds are learning to fly, disturbance near the nest site could frighten young birds away from the nest where they are more vulnerable to predation and other threats. Disturbance after young birds have fledged (late July - August) would have the least impacts. Mitigation included in Chapter 2.8.1 would reduce the potential effects of disturbance to within acceptable levels. Based on the presence of suitable nesting habitat within the project area, and the potential for disturbance of nesting goshawks, it has been determined that the

proposed action may impact individuals or habitat, but would not lead to a trend toward federal listing of northern goshawks.

Cumulative effects: Past logging activities has included mostly clear cutting and affected goshawk nesting and foraging. There are no current activities affecting habitat on National Forest System Lands in the project area although logging is still occurring off the National Forest on private lands. No activities are proposed in the foreseeable future that would affect goshawk habitat on the National Forest. Neither Alternative A nor B would differ in their cumulative effects on the goshawk since they do not alter nesting or foraging habitat.

Wolverine: Wolverines are medium sized forest carnivores about which relatively little is known. They are secretive and thought to stay in forest cover as much as possible. Although wolverines are powerful carnivores capable of taking down animals much larger than themselves, they are opportunistic omnivores with a generalist foraging strategy that includes scavenging animal carrion, feeding on berries and insect larvae, as well as direct predation of small, medium and large mammals and birds (Banci 1994). All wolverines tend to avoid humans, and females with young are particularly sensitive to human disturbance. Females den at relatively high elevations in mature and old growth forests, as well as large-boulder talus fields and mountain cirques. Deep, soft snow is often used for tunneling and den construction (Copeland 1996).

Generally speaking, wolverines are opportunistic omnivores in summer and primarily scavengers in winter (Banci 1994). Since wolverines are basically habitat generalists with an opportunistic foraging strategy, it is difficult to define foraging habitat. A study by Hornocker and Hash (1981) of wolverines in Montana indicated a preference for mature to intermediate forest types. The analysis area provides many food items common in the wolverine's diet.

Alternative A would not change the habitat conditions for wolverine. Therefore, no impacts either positive or negative are anticipated. Alternative B does not plan on manipulating forest cover. The Alternative would result in some improvement in habitat for large ungulates. This could indirectly improve the opportunity for wolverines to forage on carrion in the area. However, the overall effects would be slight. Also, no effect is anticipated on their prey species and no effect on denning areas are expected. Therefore, there are no anticipated effects on the wolverine.

Western Big-eared Bat*:* The western big-eared bat occurs in a variety of habitats but is strongly correlated with caves for roosting (IDFG 1995). Caves and abandoned mineshafts serve as daytime roosts and winter hibernacula (Kunz and Martin 1982). Females congregate in the warmer areas of the roost to form maternal colonies in spring (Finch 1992). Moths make up the primary prey of the western big-eared bat (Hamilton and Whitaker 1979). Most of these prey species reproduce on trees and shrubs, rather than on grasses (IDFG). This bat uses forest edge between streams and mountain slopes, where riparian vegetation may be an important component of foraging (Clark et al. 1993). It hunts forest edges late at night and captures most of its prey from the air, although it is capable of gleaning insects from foliage as well (IDFG 1995).

There are no known caves in the project area but there are small cliffs and rock outcrops that could provide shelter for a few roosting bats. With no high-quality roosting habitat available, it is unlikely that western big-eared bats inhabit the project area. However, there may be unknown caves in the project vicinity, and foraging habitat exists in riparian areas and along forest/grassland edges in the project area.

Under Alternative A, sedimentation due to runoff from existing roads and trails would impact water quality and eventually lead to increased degradation of riparian habitat. With no known roosting habitat available, and only minor impacts to foraging habitat expected, Alternative A would have no impact on western big-eared bats. Under Alternative B, the proposed action would have no direct, indirect or cumulative effects on bat roosting habitat. Riparian foraging habitat could be improved by the proposed action. However, while the project would improve water quality,

consequent improvements in riparian habitat would be incidental. Based on this discussion, it has been determined that Alternative B would have no impact on western big-eared bats.

Yellowstone Cutthroat Trout and Arctic Grayling:

Fish species listed as 'sensitive' on the Gallatin national Forest include Arctic grayling westslope cutthroat trout, and Yellowstone cutthroat trout. All three species are native to the project area, with Arctic grayling and westslope cutthroat historically found in those drainages emptying to the East Gallatin River (e.g. Jackson Creek) and Yellowstone cutthroat in those drainages emptying to the Yellowstone River (e.g. Bangtail Creek, North Fork Willow Creek). However, both Arctic grayling and westslope cutthroat trout are considered extirpated from the project area. Therefore, westslope cutthroat trout and Arctic grayling would not be impacted by this project. Yellowstone cutthroat trout are currently present in Bangtail, North Fork Willow, and Fleshman (Perkins) Creeks, three of the four primary watersheds encompassed by the proposed project. Bangtail and Jackson Creeks also contain brook trout and Jackson Creek may also hold rainbow trout and brown trout.

Chapter 3.2 above (Story 2006) describes the physical characteristics of the project area, including precipitation regimes, stream channel types, existing road conditions, and annual sediment yields. North Fork Willow and Bangtail Creeks do not meet Gallatin National Forest (GNF) standards for annual sediment delivery (Story 2006).

Goals of the Gallatin Forest Plan as they relate to fisheries include: 1) "Maintain and enhance fish habitat to provide for an increased fish population." and, 2) "Meet or exceed State of Montana Water Quality standards." Gallatin National Forest Plan implementation guidelines further define how fish habitat will be maintained and enhanced through the development of a stream classification system, which corresponds to the sensitivity and importance of streams relative to their aquatic communities and environments (Forest Plan 1997). The intent of this classification system is to provide specific management objectives, along with a description of optimal habitat attributes that would be associated with the habitat objectives. Sediment delivery attributes are listed in Table 3.3.

Potential road decommissioning effects on fish, amphibians and their habitats were analyzed by reviewing existing Forest Service data and analyses, by compiling data from other resource agencies, and by assessing qualitatively the potential impacts of the proposed action. This assessment included evaluating the effects of those treatments on riparian and aquatic habitats within the project area, and the potential of those treatments to modify sediment delivery to water bodies within or adjacent to the project area.

Table 3.3. Sediment delivery standards for Gallatin National Forest streams. "% fines" means the amount of fine sediments (less than 6.3 mm in size) deposited as a percentage of overall substrate composition.

Stream Category	Analysis area streams	Management objective*	Allowable % fines less than 6.3 mm	Annual allowable percent above reference**
A: Streams with Sensitive Species or Blue Ribbon Fisheries	NF Willow, Bangtail, Perkins Creeks	90% (of reference)	<25	30%
B: All other streams	Jackson Creek	75% (of reference)	<30	50%

***% of reference = % similarity to mean reference condition**
****Reference = observed relationship between substrate % fines and modeled sediment delivery in reference (fully functioning) GNF watersheds.**

Three categories of potential road decommissioning effects were used to analyze impacts of the proposed project: modifications to riparian vegetative communities; modifications to stream channel form and function; and direct impacts to fish and amphibian eggs, juveniles, or adults. Hydrologic effects or changes in hydrologic processes such as changes in the timing and intensity of spring runoff were addressed in the hydrology section of the water analysis (Story 2006).

As previously noted, the primary intent of the proposed project is to reduce sediment production to streams and wetlands from roads within the project area. As analyzed and summarized in Chapter 3.2 (Story 2006), the project's decommissioning of about 46 miles of road would reduce overall annual sediment production within the drainages encompassed by the project area (Jackson, NF Willow, Bangtail, and Perkins Creeks) by over 10 percent. As such, this project would bring the North Fork of Willow Creek and Bangtail Creek, where annual sediment production would decrease by over 20 percent, to within Gallatin National Forest sediment delivery standards (Story 2006). Because treatments require mechanical disturbance, such as ripping, culvert removal, and especially recontouring, small and localized sediment increases would likely occur. However, the results of treatment, including construction of erosion ditches, slash placement, and soil decompaction, coupled with revegetation, are expected to quickly reduce sediment to below pre-treatment levels (Story 2006). Thus, the net effect of Alternative B would be to reduce annual sediment delivery to streams and other aquatic habitats, thereby reducing the negative impacts of such sediment delivery.

As with sediment delivery, road decommissioning activities under Alternative B may have short-term impacts to riparian vegetation and stream channel form, function and stability. However, such effects would be localized and temporary (Story 2006). The proposed treatment types would ultimately increase the health of riparian vegetation through reduction in soil compaction and restored hydrologic function, and stream channel form, function and stability would be improved by culvert removal and reduced fine sediment delivery. Therefore, the short-term negative impacts of project activities to riparian vegetation and stream channels are greatly off-set by the long-term benefits.

Finally, the mechanical activities associated with road decommissioning can potentially directly impact fish eggs, juveniles, or adults through direct impacts such as trampling or crushing or by a fuel spill. Risks of the former are small because stream or wetland crossings would be limited and unlikely to provide spawning habitat. While it is impossible to rule out the possibility of an individual fish being crushed during project activities, such events are unlikely because project activities would disperse animals from the immediate project areas. Furthermore, the possible loss of a few individuals is more than compensated by the long-term benefits of the project. Finally, the probability of a fuel spill is low.

The risks of negative direct and indirect effects are not expected to be measurable or significant to any fish species or their habitat, and would be more than compensated by the beneficial effects of the project

<u>*Cumulative effects:*</u> Activities that could contribute to effects on fisheries include subdivisions on lands on the west side of the Bangtail Mountains outside the project area. There are no known proposals to subdivide lands immediately adjacent the decommissioning project. There are no proposed timber sales or road construction. Recently, some private lands sold in the North Fork of Willow Creek. The owner expressed an interest in constructing a new access road to the property. However, nothing is confirmed. Livestock grazing continues on allotments throughout the project area.

Updated streambank riparian grazing standards were implemented in 2003 on the North and Middle Forks of Willow Creek on a trial basis. They were implemented to improve riparian conditions in the Willow Creek Grazing Allotment. Some fisheries restoration projects have been implemented on Bangtail and North Willow Creek. Log structures have been installed on Bangtail Creek to create pools. North Willow

Creek has a section of stream with an enclosure protected by an electric fence. The fence was erected to better manage livestock use. The stream banks in the enclosure are planted with willows. The North Fork and Middle Fork of Willow Creek are frequently monitored several times each summer by the grazing permittee and the Forest Service to calculate the percent of bank trampling. When the grazing standards are met, the livestock are removed from the allotment to private lands.

Under Alternative A, sediment inputs to areas of several streams would continue to be chronic especially when combined with livestock grazing impacts. The effects of sediment would be widespread and long-term as would impacts to streambanks and riparian vegetation, and effects to fish eggs, juveniles, and adults are probable. Annual sediment delivery would continue, as would problems with stream hydrologic function, soil compaction, and stream channel form and function.

Under Alternative B sediment inputs to the stream would be localized and short-term, as would impacts to streambanks and riparian vegetation, and direct effects to fish eggs, juveniles, and adults are possible but improbable. By contrast, beneficial effects would be measurable and would provide substantial improvements. For instance, annual sediment delivery would be reduced, hydrologic function would improve, soil compaction would decrease, and stream channel form and function would be restored.

Northern Leopard Frog and Boreal Toad: There are two Gallatin National Forest sensitive amphibians, the northern leopard frog and the boreal toad. The northern leopard frog is widely distributed at lower elevations and is documented as present in the Shields and East Gallatin River drainages, although not in the project area. Western toads are also widespread, including at elevations up to 9500 feet, and are known from drainages near, or adjacent to, the project areas (project files; Atkinson and Peterson 2000).

Northern leopard frogs breed from mid-March to early June (Maxell 2000). Mating occurs when males congregate in shallow water and begin calling during the day (Maxell 2000). Eggs are laid at the water surface in large, globular masses of 150 to 500 (Maxell 2000). Young and adult frogs often disperse into marsh and forest habitats, but are not usually found far from open water (Maxell 2000). Overwintering habitat is the bottom of permanent water bodies, under rubble in streams, or in underground crevices. Because no suitable habitat would be impacted by these projects and northern leopard frogs are not likely present in the project area, northern leopard frog populations would not be impacted by this project.

Western toads inhabit all types of aquatic habitats ranging from sea level to 12,000 in elevation (Maxell 2000). They breed in lakes, ponds, and slow streams, preferring shallow areas with mud bottoms (Maxell 2000). Western toads breed from May to July, laying long, clear double-strings of eggs (Maxell 2000). Tadpoles metamorphose in 40 to 70 days (Maxell 2000). Because of their narrow environmental tolerance, adults must utilize thermally buffered microhabitats during the day, and can be found under logs or in rodent burrows (Maxell 2000). Adults are active at night and can be found foraging for insects in warm, low-lying areas (Maxell 2000). Western toads overwinter in rodent burrows and underground caverns. Because no breeding and rearing habitat would be impacted by these projects, although some dispersed individuals may be impacted, western toad populations would not be impacted by this project.

Alternative A would continue to provide degraded habitat for amphibians because of road crossings, increased sediment, and reduced stream and watershed hydrologic function. Implementation of Alternative B may impact dispersed boreal toad during project implementation, but over the long-term would have a beneficial impact on populations. This determination is based on the overall benefits of the project as previously described.

Cumulative effects: Cumulative effects would be very similar to those effects discussed for fisheries for both Alternative A and B.

***Sensitive Plants*:** Sensitive plant species on the Gallatin Forest are generally found in fragile environments such as moist, boggy areas and in alpine habitats. These species rarely occur in highly disturbed sites such as those already impacted by road construction and/or timber harvest. Therefore, sensitive plant species are not expected to occur in proposed treatment areas. Alternative A would have no impact on sensitive plants. Alternative B does not involve ground-disturbing activities in alpine habitat. Mitigation included in Chapter 2.8.1 would mitigate concerns over the loss of sensitive plant species. Wet or moist soil types that have already been disturbed by road construction or timber harvest activities are not likely to contain sensitive plant species.

3.3.2 Management Indicator Species

Management indicator species (MIS) are wildlife whose habitat is most likely to be affected by management practices thereby serving as indicators of habitat quality. The Gallatin Forest Plan identifies five terrestrial species as MIS. These are the grizzly bear, bald eagle, northern goshawk, American marten and elk. Wild trout are MIS for coldwater fisheries (Gallatin Forest Plan 1987). Grizzly bear, bald eagle and goshawk are addressed above. Because no manipulation of forest habitat is proposed, there would be no anticipated affects on the American Marten.

Elk: The Forest Plan designated elk as a MIS for big game habitat. Elk are common throughout the project area during spring, summer and fall. The project area does not contain winter range, which is primarily located on private land in the Shields River Valley, or on the west side of the Bangtail Range. Calving grounds are present within the project area, typically in transition areas between winter and summer habitat.

Road density is a concern for elk habitat in terms of fragmenting elk security areas and increasing elk vulnerability during the hunting season (Table 3.4). The Bangtail Range is recognized as having some of the highest road densities on the Gallatin National Forest, with over 3 miles of open road per square mile of land over the entire mountain range. However, those targeted for decommissioning are generally considered closed to public travel, and closed roads do not count in calculation of elk habitat effectiveness. Although considered closed for road density calculation purposes, there is likely some incidental motorized use that occurs on these roads from time to time, since not all roads are physically barricaded. Nevertheless, use levels on roads identified for decommissioning are considered very low to non-existent, because these roads generally terminate in a harvest unit and do not offer good motorized recreation potential. The high road densities in the Bangtail Mountains are due mostly to logging, most of which occurred when these lands were privately owned.

Table 3.4. Open Road Densities. This table displays the before and after open road densities by 6th order Hydrologic Unit for the two alternatives.

		Alternative A(No Action)		***Alternative B***	
6th Order HUC Drainage	***National Forest Lands within 6th HUC****	***Existing Miles of Road***	***Resulting Miles/Sqmi***	***Resulting Miles of Road***	***Resulting Miles/Sqmi***
Bangtail Creek	4323 ac	37.3	5.5	20.1	3.0
Jackson Creek	2882 ac	24.5	5.4	14.2	3.2
Perkins Creek	972 ac	5.8	3.9	3.4	2.3
Willow Creek	3814 ac	34.1	5.7	16.0	2.7

Under Alternative A, open road corridors would perpetuate habitat fragmentation as timber harvest units regenerate and grow back into hiding cover.

In addition, if not treated, these roads would continue to deliver sediment to streams, potentially impacting riparian vegetation. Riparian

habitat serves as both thermal and hiding cover for elk and provides forage value as well. Disturbance impacts from continued motorized use of project roads is possible, but considered very minor.

Under Alternative B, in the short term, increased human presence and noise from heavy equipment could have considerable disturbance effects on elk, and may result in temporary displacement from suitable summer/fall habitat. In the long term, road treatment would facilitate vegetative growth and reduce overall habitat fragmentation as logged area regenerate. Water quality would improve, which should facilitate healthy growth of riparian vegetation.

Cumulative Effects: Past activity having the most impact on elk was road construction. In addition, logging reduced hiding cover. Open road densities are high as is reflected in Table 3.4. Currently, there is no road construction or harvesting activities proposed within the project area on National Forest. There is logging and road construction occurring in some areas to the west of the project area on private lands in the Bangtails. Some areas of private land are subdivided into residential lots. Foreseeable activities likely include additional private land development and road construction. There is a proposal to create the Bangtail Botanical and Paleontological Special Interest Area on the National Forest Lands along main ridge of the Bangtails Mountains. The function of the area is scientific research for the benefit of the public. Designation of a special interest area is not expected to add cumulatively to the effects of the proposal to decommission roads. Cumulatively, Alternative A would not improve big game habitat. In view of the potential for adjacent activities on private land, Alternative B would contribute substantially to improving security for elk and other big game.

Wild trout and other Aquatic Life*:* All wild trout are management indicator species for coldwater streams. Management indicator species occurring in the project area include brook, rainbow, and Yellowstone cutthroat.

No activities are planned under Alternative A. Category A streams in the project area would continue to exceed the standards for sediment. Alternative B proposes several activities that would cause ground disturbance and would result in sediment entering streams. These ground-disturbing activities are expected to be very minimal and short term. A few acres would be disturbed on each road surface to complete the decommissioning work. Once the roads are decommissioned, the sediment yields are predicted to be reduced to within the recommended standard for Category A streams. Therefore, the anticipated adverse environmental effects on aquatic resources are anticipated to be minimal and short-term. However, there are expected to be long-term beneficial effects on aquatic species from reduced sediment

Cumulative Effects: Bangtail Creek and Willow Creek are Category A streams according to the Gallatin National Forest sediment guidelines. These streams contain Yellowstone cutthroat trout. As discussed under sensitive species, stream bank riparian grazing standards have been implemented in 2003 on the North and Middle Forks of Willow Creek on a trial basis to improve riparian conditions in the Willow Creek Grazing Allotment along with fisheries restoration projects on Bangtail and North Willow Creek. The North Fork and Middle Fork of Willow Creek are frequently monitored several times each summer by the grazing permittee and the Forest Service to calculate the percent of bank trampling. When the grazing standards are met, the livestock are removed from the allotment to private lands.

Alternative A would not contribute any additional beneficial effects. However, the combined effects of implementing Alternative B along with the steps taken to improve riparian grazing could substantially improve fish habitat conditions.

The affects analysis related to wildlife indicates the Alternative B would be low in controversy and would no involve any unique or unknown risks.

Noxious Weeds: Noxious weeds are identified as one of the main threats to the ecological health of the National Forest System. Costs to treat noxious weeds using a variety of methods are increasing. Each year more resources and strategies are directed toward the problem of invasive species. There are no extensive weed populations in the project area. Most weeds are found immediately along the roads. Houndstongue, Canada thistle and musk thistle are the most common noxious weeds. These weed populations are usually sprayed on an annual basis depending upon the dollars available and the priority areas needed for treatment. There are small populations of sulfur cinquefoil along the Olsen Creek Road several miles from the area. One plant of Dalmatian toadflax was found on the Olsen Creek Road in 2004 and was pulled (Montana Noxious Weed List 2005). Small populations of spotted knapweed are found in a several places in the Bangtail Mountains (Gallatin Noxious Weed GIS Database 2005).

Logging, road construction, livestock, recreationists, and wildlife, etc. have introduced species not formerly present, especially Canada thistle. It is possible that noxious weeds could continue to spread behind decommissioned roads if existing populations are not monitored and treated. The last large-scale effort of weed control was conducted in summer of 2004 when many of the roads in the Bangtails were sprayed. Some spraying of high priority sites was completed in 2005. Prior to 2005 a Forest Service crew and a contractor conducted weed spraying in the Bangtails. While at this point weeds are not expanding greatly they are expanding. Weeds in the Bangtails are scheduled (and funded) to be sprayed again in 2006.

Alternative A would provide the best opportunity to control weeds because access would be maintained. However, the problem of weed establishment would be perpetuated since these roads would remain open to the public and remain generally sparse of vegetation. Even if they were gated, wildlife and livestock which are identified as vectors for the transportation of weeds would continue to establish weeds. The best long-term solution is to return these areas to the production of native vegetation; especially native forests. So far none of the weeds established on the Forests show an ability of persist underneath a canopy of forest cover. Alternative B would therefore be the best long-term solution. Implementation of Alternative B requires vigilance in monitoring weed populations of decommissioned roads (Chapter 2.8.1). Access would be reduced and the cost of treating isolated weed infestations would increase.

Cumulative Effects: The introduction of exotic invasive species has been aggravated by road construction that created areas for invasive species to colonize, logging which removed protective vegetation, and the introduction of vectors for the movement of seeds such as livestock, and motorized and non motor vehicles, etc. Along with these pathways of movement are the native wildlife that also transport seeds. All these factors are ongoing and continue to spread weeds around the general area. Implementation of Alternative A would provide continued access to weeds sites but would not reduce the long-term problem of roads acting as thoroughfares for the transportation of weeds. Alternative B, while it reduces access, would provide the best long-term solution since it rehabilitates disturbed areas.

3.4 Cumulative Effects Summary

There are many activities that take place within and around the project area. All of the area is surrounded by private land with some development in the form of subdivision and the sale of property occurring. There is a proposed land purchase and exchange near the south end of the Bangtails on both sides of Interstate 90. This would result in the National Forest acquiring about 815 acres of land. There is also a proposal to create a 1,240 acre conservation easement in that area. This acquisition and the conservation easement would maintain the many acres of wildlife habitat in the area.

One proposal to reduce the risk of wildfire is currently being implemented in the Grassy

Mountain area three miles to the northwest of the proposal. This involves prescribed fire in areas of conifer encroachment into rangelands. No proposals are known that would include other forest management activities. Livestock grazing occurs on four National Forest grazing allotments in the area.

There is the potential for conflicts with grazing livestock and decommissioning roads could reduce access to allotment improvements. Mitigation included in Chapter 2.8 would reduce the likelihood of problems occurring.

There is a proposal to create the Bangtail Botanical and Paleontological Special Interest Area along the top of the Bangtail Mountains. The environmental assessment for the establishment of this special interest area (SIA) is expected to be completed in 2006. No adverse cumulative effects are expected between this project and establishment of the SIA. There maybe beneficial cumulative effects since road decommissioning would help reestablish some of the overall ecological health of the area.

Public firewood gathering, hunting, motorized and non motorized recreation occur in the area. There are no proposed Forest Service forest management activities proposed in the Bangtails and none currently underway. Noxious weed management occurs on an annual basis and includes the use of approved herbicides.

3.5 Irreversible and Irretrievable Commitments

An irreversible commitment of resources refers to the use or commitment of resources that is incapable of being reversed or changed. Irretrievable commitment of resources refers to actions that result in changes to resources that cannot be recovered or regained.

The physical change in the landscape when roads are constructed is an irreversible loss in the aesthetic quality of the area and to some extent the hydrologic function of the watersheds. Under Alternative A, no change would occur and under Alternative B, many road prisms would not be completely recontoured. There would always be some road prism visible. In addition, to some extent this would always have some affect on the hydrology of the area. No matter how thorough the decommissioning job is, the area would never be as it was prior to constructing the roads. Over the very long term Alternative B would reduce the time the roads are visible and would remove most of the detrimental effect the roads have on the hydrologic function of the watersheds.

Alternative A would result in an irretrievable loss of stream health. Since the streams are currently in a degraded condition, the stream themselves and the riparian habitat they support are not producing to their full potential. For instance, the fisheries produce only a fraction of the fish they could under pristine conditions. The number of fish that could have been produced if the stream were pristine is an irretrievable loss.

Access for logging may not be an irreversible loss since logging technology can compensate for the reduced road densities. As it relates to motorized access, decommissioning roads in not an irreversible commitment. Decommissioned roads could be reconstructed if the need arises. That is why it is called decommissioning and not road obliteration.

Overall, this project appears to be low in controversy based on the limited amount of public response to scoping and the limited adverse environmental effects. It is not precedence setting since road decommissioning is a common practice and implementation of this project would not change National Forest programs or policies. There are no future actions that would become imminent or necessary as a result of this decision.

Such things as access to private land or improvements such as power lines are maintained.

3.6 Required Disclosures and Potential Conflicts with Plans and Policies of other Jurisdictions

Implementation of Alternative A would not be incompliance with the Lynx Conservation and

Assessment Strategy (Chapter 3.3). The LCAS states…"Determine where high total road densities (> 2 miles per square mile) coincide with lynx habitat, and prioritize roads for seasonal restrictions or reclamation in those areas" (LCAS:7-10). Therefore, Alternative A would not be consistent with LCAS direction, whereas Alternative B is consistent.

Under Alternative A, the sediment analysis for existing road miles indicates that both Bangtail Creek and Willow Creeks are in excess of the 30 percent over reference (natural) standard for Category A streams. Perkins Creek is also a Category A stream since it is a tributary to Fleshman Creek, which has Yellowstone cutthroat trout in the lower 8 miles. Bangtail Creek and Willow Creek, at 44 percent and 45 percent over natural respectively, exceed the 30 percent over natural guideline. The R1R4 model indicates that Perkins Creek is currently at the sediment standard. Implementation of Alternative A would result in sediment levels continuing at the current levels which are in excess of the required standards to meet the Clean Water Act.

The proposed action would comply with applicable laws and regulations.

3.7 Environmental Justice

Executive order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, directs federal agencies to integrate environmental justice considerations into federal programs and activities. Environmental justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in the disproportionately high and adverse manner by, government programs and activities affecting human health or the environment (E.O. 12898 and Departmental Regulation 5600-2).

None of the alternatives would have a discernible effect on minorities, American Indians, or women, or the civil rights of any United States citizen. No alternative would have a disproportionate adverse impact on minorities or low-income individuals.

3.8 Energy Requirements and Conservation Potential of Alternatives

Alternative A would require no commitment of energy since no equipment would be used to implement any activity. Alternative B on the other hand would require the fuel used by the heavy equipment during the decommissioning process plus the fuel used by vehicles traveling to a from the work site. Perhaps a few hundred gallons of fuel would be consumed to implement the project. This amount is not a substantial or an unusual amount since this amount of fuel is consumed by dozens of projects throughout the Gallatin valley on a daily basis.

3.9 Environmental Effects that Can Not be Avoided

Under Alternative A degradation of water quality would continue and is an unavoidable effect of the alternative as are losses in habitat for wildlife and the continued disruption of watershed hydrology. As stated in the Chapter 3.2 some sediment would enter the streams if Alternative B were implemented. This is expected to be short-term but could cause some localized adverse affects on water quality. This is especially true for the first few hours after stream crossings and culvert removals are undertaken. Roads provide access for fire suppression. While Alternative B would reduce access for fires, there are still high road densities remaining and many opportunities for access for fire suppression.

Chapter 4.0 List of those Persons Conducting this Analysis and Persons and Agencies Contacted.

4.1 Person Conducting this Analysis

John Councilman	ID Team Leader
Mark Story	Gallatin National Forest Hydrologist
Beverly Dixon	Bozeman Ranger District wildlife Biologist
Scott Barndt	Gallatin Fisheries Biologist
Reggie Clark	Bozeman Ranger District Rangeland Conservationist
Brian McNeil	Trails and Recreation

4.2 List of Persons and Agencies Contacted

Alliance for the Wild Rockies
American Wildlands
Big Sky Country Trail Prservers
Bozeman Daily Chronicle
Brent Foster
Carlstrom Ron
Chamber of Commerce
Defenders of Wildlife
c/o Hank Fischer
Dept Natural Res & Conservation
c/o Curt Tesmer
Ecology Center
c/o Sherman Bamford
Federation of Fly Fishers
Forest Guardians/FCC
Billy Stern
Gallatin County Commissioners
Gallatin Wildlife Assn
George Reed Jr. Crow Cultural Education Committee
Greater Yellowstone Coalition
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Ham Ranch LLC
Harms Livestock
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Hewitt, Kirk
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MFWP, Craig Jourdonnais
MFWP, Scott Opitz
MFWP, Joel Tohtz
MFWP, Tom Lemke
Montana DNRC
Montana Wildlife Federation
MT Dept Environ Quality c/o Tom Ellerhof
MT Ecosystem Defense Council
c/o Steve Kelly
MT Environmental Info Center
MT Wilderness Assn
N Rockies Preservation
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Native Forest Network
Predator Conservation Alliance
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Robinson Ranch INC,
R-Y Timber Inc
Senator Conrad Burns
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Appendix #2 Site-Specific List of Proposed Work

The proposed work is our best estimate of what needs to be completed to decommission the roads and rehabilitate ATV trails not part of the Forest Travel Plan. Information on these roads has been gathered over a number of years starting in 1996. Although we did our best to accurately estimate the work, we know that once the work starts there could be some changes.

Therefore, we have some general guidelines we would follow in those situations where the site-specific data doesn't seem to fit.

- Road surfaces that have good regeneration of grasses, trees and other vegetation would not be ripped. To take advantage of advanced growth of vegetation only slash and other debris such as rock would be placed on the road surface to eliminate motorized use. In many cases this would be done by handto leave vegetation intact.

- Roads where the placement of slash would not be sufficient to eliminate motorized use would have the beginning of the road recontoured; usually the first 100 feet. Slash, debris, and seed would then be placed on the recontoured surface to reduce visual impacts and to help establish vegetation.

- The entire road lengths would be checked for erosion problems. Shallow erosion ditches (waterbars) would be constructed to channel water off the road surfaces. Some areas of erosion may be ripped to facilitate water infiltration into the road surface.

- Areas where road surfaces are compacted and little or no vegetation is establish would be ripped and seeded with a native grass mix (weed-free). Slash would be placed on the disturbed areas.

- All the work would be done in a manner that is as visually unobtrusive as possible. For example, no large earthen-berms would be constructed.

- Slash for placement onto the road surfaces would come from sources adjacent the road. Typically there is adequate slash nearby.

- A dozer or excavator would be used to accomplish most of the work.

- Pulled culverts would be disposed of.

- All areas where culverts are removed would be reseeded. Where roads cross perennial streams the stream banks would be stabilized with coir matting. All crossings would be regraded to approximately the original grade of the stream.

Map Road Site #	**Proposed Work**
1A	Slash first 10 ft and reseed*
1B	Re-contour, Slash and seed first 100 ft. (be careful of survey marker)
2	Slash 50 ft. section with debris starting from FS road #974
3A	Push over 3 additional trees to complete slashing
3B	Push over 2 trees

Map Road Site #	Proposed Work
4A	Re-Contour from FS Rd. # 974 to fork (Approx. 200 ft.), Rip 100 ft. past fork
4B	Slash heavily first 100 ft.
6	Place slash only
7A	Re-Contour 300 ft. starting from fork, place slash to reduce erosion
7B	Slash from entrance to fork w/ deadfall (Approx. 300 ft.), Rip 500 ft. starting from fork.
8	Slash w/ deadfall from entrance 20 ft.
9	Rip and slash a 200 ft. section beginning 250 ft. from entrance and ending 50 ft. from entrance, Re-contour 50 ft. to entrance
10	Re-contour 25 ft. starting from entrance, Slash
11	Re-contour 25 ft. starting from entrance, Slash w/ debris to downed tree
12	Re-contour a 50 ft. section beginning 20 ft. from entrance, Slash with debris 20 ft. to entrance
13	Place slash only
14	Place slash only
15	Slash 20 ft. starting from entrance
16	Slash w/deadfall first 10 ft. on each end
17	Rip and Slash 100 ft. starting from entrance
18	Slash with debris 50 ft. starting from entrance
19	Place slash
20	Re-contour from FS Rd. # 1760 to ATV trail
21	Place slash and do not rip established vegetation
22	Place slash and do not rip established vegetation
23	Place slash only
24	Re-contour 100 ft., Remove 2 culverts, place slash to reduce erosion
25	Re-contour 200 ft. starting at entrance to ATV trail, Push or pull approx. 10 standing trees onto road surface, Remove culvert, place slash
26	Rip, Slash and Seed 100 ft. starting at entrance
27	Construct/ re-construct 10 erosion ditches, Re-contour 300 ft. starting from entrance. Place slash
28A	Rip and slash 400 ft. starting from entrance
28B	Re-contour 100 ft. starting from fork, place slash to reduce erosion
29	Rip/ re-contour from entrance to corner (Approx. 100 ft.), remove 2 culverts
30	Rip 25 ft. starting from entrance, place slash
31	Place slash
32A	Re-contour 50 ft. starting from entrance, remove culvert
32B	Re-contour 100 ft. starting from entrance, Slash ATV trail at end of road
33	Re-contour, Rip and slash 200 ft. starting from entrance
34	Rip, slash, re-contour 100 ft. starting from entrance
35	Rip and slash From 35A to FS road #1760 (Approx. 100 ft.)
35A	Slash w/debris 20 ft. starting from fork
35B	Rip first 200 ft., re-contour visible cut (Approx. 100 ft.), place slash

Map Road Site #	Proposed Work
36	Re-contour 100 ft. starting where road cut begins 50 ft. from Entrance, place slash
37	Re-contour 100 ft. starting from entrance, place slash
38	Place slash
39	Re-contour 100 ft., Slash skid trail w/debris (Approx. 10 ft.) and seed
40A	Slash w/debris 100 ft. starting from entrance
40B	Slash w/debris 100 ft. starting from entrance
41	Rip and slash 200 ft. start from Entrance
42	Place slash
43	Rip and slash 20 ft. section starting 10 ft. from entrance
52A	Rip 200 ft, starting 300 ft. from entrance, Rip hill (Approx. 50 ft.) and construct 5 erosion ditches
52B	Rip incline (Approx. 50 ft.), scatter debris, construct 5 erosion ditches
53	Re-contour 200 ft. start from entrance, place slash
54	Re-contour 100 ft. start from entrance, place slash
55A	Recommend keeping open for ATV route. If closing- rip 100 ft. from each end, Slash heavily
55B	Re-contour 50 ft., Slash
56	Slash 50 ft. starting from entrance
58	Re-contour 50 ft., Slash
59	Place slash
60	Place slash
61	Place slash
62	Start from entrance rip to creek approx. 200 ft, Fall trees in timber area, Scatter debris in open area
66	Rip and slash with debris 50 ft. starting from entrance
67	Re-contour 200 ft., remove culvert
68	Rip 50 ft. starting from entrance, slash with debris
69	Re-contour 100 ft. start from entrance, remove culverts
70	Re-contour 100 ft., construct 3 erosion ditches
71	Re-contour 100 ft. start from entrance, slash heavily
72	Rip 50 ft. starting at ATV trail, Re-contour 50 ft. starting from FS rd # 977, Slash with debris
73	Rip both roads 50 ft. each, pile both with debris
74	Build up road embankment/ reinforce ditch
75	Re-contour 200 ft. start from entrance, place slash
77	Re-contour and Slash w/debris 100 ft starting from entrance
78	Place slash
79	Re-contour to fork (Approx. 50 ft.), place slash
79A	Re-contour 100 ft starting from entrance, place slash
79B	Rip and slash 50 ft. start from entrance
79C	Re-contour and slash 100 ft. start from entrance
80	Place slash
81	Slash skid trail (10 ft.)
82	Place slash
83	Rip and slash 50 ft. start from entrance
84	Place slash
85	Place slash

Map Road Site #	Proposed Work
86	Slash to intersection of # 87 (Approx. 20 ft.)
87	Slash at intersection to # 86 (Approx. 10 ft.)
88	Re-contour 50 ft. start from intersect to # 86
89	Slash 10 ft.
90	Slash with debris50 ft.
92	Re-contour 100 ft. start from entrance, place slash
93B	Re-contour 50 ft. start from entrance, place slash
94	Re-contour 100 ft. start from entrance, remove culvert, place slash
95	Place debris on road surface across meadow, Rip length of road (Approx. 200 ft.)
96	Place slash, continue to provide motorized access to campsite
98	Re-contour 100 ft. starting from entrance, slash, remove culvert
100	Re-contour 50 ft. area just before culvert crossing, Rip ¼ mile long & 15 ft. wide starting from en-trance, Remove culvert
102	Rip 100 ft. length starting from entrance
103	Rip/slash 100 ft. starting from entrance
104	Re-contour 200 ft. starting from entrance, place slash
105	Re-contour 100 ft. starting from entrance, place slash
106	Re-contour drainage (Approx. 5 ft. deep), place slash
107	Rip road surface where needed, construct erosion ditches and place slash
108	Rip road surface where needed, construct erosion ditches and place slash
109	Rip road surface where needed, construct erosion ditches and place slash
110	Rip road surface where needed, construct erosion ditches and place slash
111	Rip road surface where needed, construct erosion ditches and place slash
113	Rip road surface where needed, construct erosion ditches and place slash
114	Rip road surface where needed, construct erosion ditches and place slash
115	Rip road surface where needed, construct erosion ditches and place slash
116	Rip road surface where needed, construct erosion ditches and place slash
117	Rip road surface where needed, construct erosion ditches and place slash
118	Rip road surface where needed, construct erosion ditches and place slash
119	Rip road surface where needed, construct erosion ditches and place slash
120	Rip road surface where needed, construct erosion ditches and place slash
121	Rip road surface where needed, construct erosion ditches and place slash
123	Rip road surface where needed, construct erosion ditches and place

Map Road Site #	Proposed Work
	slash
124	Rip road surface where needed, construct erosion ditches and place slash
125	Rip road surface where needed, construct erosion ditches and place slash
126	Rip road surface where needed, construct erosion ditches and place slash
127	Rip road surface where needed, construct erosion ditches and place slash
128	Rip road surface where needed, construct erosion ditches and place slash
129	Rip road surface where needed, construct erosion ditches and place slash
130	Rip road surface where needed, construct erosion ditches and place slash
131	Rip road surface where needed, construct erosion ditches and place slash
132	Rip road surface where needed, construct erosion ditches and place slash
133	Rip road surface where needed, construct erosion ditches and place slash
134	Rip road surface where needed, construct erosion ditches and place slash
135	Rip road surface where needed, construct erosion ditches and place slash
136	Rip road surface where needed, construct erosion ditches and place slash
137	Rip road surface where needed, construct erosion ditches and place slash
138	Rip road surface where needed, construct erosion ditches and place slash