

CHAPTER 3

Affected Environment and Environmental Consequences

I. INTRODUCTION

This chapter describes the environment affected or created by the two action alternatives discussed in Chapter 2 and forms the scientific and analytic basis for the comparisons made between these alternatives. It also lists past, present, and reasonably foreseeable future activities considered in the cumulative effects analysis. The impacts for each alternative are discussed for those issues influencing the decision being made. For each issue, this chapter addresses: a) the affected environment, b) direct and indirect effects, and c) cumulative effects. A discussion of the proposed road improvement's consistency with the Gallatin Forest Plan and other applicable laws, regulations, policies, and other direction is provided at the beginning of this chapter. Additional information may be found in the project file located at the Livingston Ranger District Office.

Some of the effects discussed are complex and not easily quantified. Consequently, many of the values presented are modeled predictions of the effects and the actual effects may not occur exactly to the degree presented. More important than the exact effects, is the comparison of change between alternatives and present condition as predicted by models and analytic projections.

II. APPLICABILITY OF THE FOREST PLAN, LAWS, REGULATIONS, POLICIES, AND OTHER REQUIRED DISCLOSURES

Forest Plan Management Direction

This document tiers to the Final Environmental Impact Statement and Land and Resource Management Plan (Forest Plan) for the Gallatin National Forest (Record of Decision signed 9/23/87). The Forest Plan provides direction for all resource management programs, practices, uses, and protection measures for the Gallatin National Forest. Many of the proposed improvements to the surface of the Shields River Road would occur where the road crosses private land. Direction can be found primarily in the Forest Plan sections on goals (FP, pp. II-1 to II-2), objectives (FP, pp. II-2 to II-7), and standards (FP, pp. II-14 to II-29). The Standards that apply to the proposed road improvements are:

1. The Forest will cooperate with other landowners in developing roads or road systems, which serve mutual, needs.
2. A satisfactory jurisdictional status for roads on National Forest and other public land will be sought in cooperation with appropriate authorities.

3. Road and trail management will be determined as part of area transportation analysis and will be based on management area needs, such as recreation access, wildlife security, soil protection, economics, and protection of the investment.
4. Roads and trails will be designed to standards that meet resource management objectives.
5. Noxious weeds along roads and trails will be treated.
6. Existing roads and trails will be maintained consistent with management area goals.

Improvements proposed on National Forest land are also subject to direction that is specific to the Management Area where the proposed actions would occur. The Forest Plan subdivided the forest into 26 management areas (MA's). These areas are described in detail in Chapter 3 of the Forest Plan (FP, pp. III-2 through III-73). The following actions are proposed on National Forest lands assigned to Management Area 8, Timber Management:

- A parking area would be constructed near the junction of the Sunlight Road #6630 and the Shields River Road. A permanent, handicapped-accessible toilet and a bulletin board would be installed in the parking area.
- The existing gate at mile 5.1 on the Shields River Road would be relocated adjacent to the proposed parking area. The existing gate on the Sunlight Road, located approximately one-half mile above the junction of the Sunlight and Shields River Roads, will be moved closer to the proposed parking area.
- Signs would be installed at the parking area.
- A pit site would be developed adjacent to the Sunlight Road in Section 26, T5N R10E, MPM. Gravel will be stored at the pit and made available for future road maintenance. A temporary turnout would be constructed on the Sunlight Road.
- Road surfacing would be replaced on approximately 0.1 mile of the Shields River Road, leading to the Deep Creek Bridge.

The following actions are proposed on National Forest lands assigned to Management Area 7, Riparian Management Areas:

- Two bridges across the Shields River would be widened approximately 6 feet on each side to allow double-lane traffic.
- A major culvert on the South Fork of the Shields River would be replaced.

- The streambed will be modified upstream of the existing bridge over the Shields River at milepost 2.6. Rock will be excavated from the channel and placed to redirect stream flows away from erodible banks.
- Existing riprap at the base of the bridge abutments would be re-positioned to widen the channel beneath the bridge while retaining loose fill material along the approaches on either side of the Shields River.
- The existing bridge across Deep Creek would be replaced.
- A wetland will be expanded.

Federal Laws

Based on the issues identified in Chapter II, the principle Federal laws applicable to this proposal include the: National Forest Management Act of 1976, Endangered Species Act of 1973, National Historic Preservation Act (as amended 1992), American Indian Religious Freedom Act, and Native American Graves and Repatriation Act. Compliance with these laws is discussed below, or references within this document are noted.

National Forest Management Act of 1976 / Gallatin Forest Plan

The National Forest Management Act (NFMA) set certain management requirements for forest plans to meet, pertaining to conservation of such resources as soil and water and plant and animal diversity (36 CFR 219.27). The Gallatin Forest Plan standards are established to meet these requirements.

Alternatives A and B would be consistent with NFMA and management direction provided by the goals, objectives, and standards of the Forest Plan.

Endangered Species Act of 1973

Under Section 7 of the Endangered Species Act, each Federal agency must ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any threatened or endangered species. If a threatened or endangered species, or species proposed for listing occurs in an area where a project is proposed, a Biological Assessment (BA) must be conducted. If the action will result in a "may affect" or "beneficial effect" determination for the species, consultation with the U.S. Fish and Wildlife Service must occur. If the action results in a "not likely to adversely affect" conclusion, informal consultation and a letter of concurrence must be obtained from the U.S. Fish and Wildlife Service. If a "no effect" results, no consultation is necessary. To reduce effects of an action to an acceptable level, mitigation (coordination measures) may be necessary.

This analysis has complied with the Endangered Species Act, Section 7. A Biological Assessment (located in the Project File) will be submitted for review and concurrence prior to issuing a Finding of No Significant Impact (FONSI) and Decision Notice (DN).

The following tables summarizes the results of the analysis of effects on animal species classified as Sensitive, Threatened, or Endangered

Table 3-1: Summary of Effects: Sensitive, Threatened, Endangered or Sensitive Animal Species

No Effect	May Affect; Not Likely to Adversely Effect	No Impact	May Impact Individuals or Habitat; Not Likely To Contribute To A Trend Towards Federal Listing	No Suitable Habitat
<ul style="list-style-type: none"> • Gray Wolf • Bald Eagle • Elk 	<ul style="list-style-type: none"> • Canada Lynx 	<ul style="list-style-type: none"> • Peregrine Falcon • Wolverine • Townsend’s Big-Eared Bat • Flammulated Owl • Northern Goshawk • Trumpeter Swan • Harlequin Duck • Black-Backed Woodpecker 	<ul style="list-style-type: none"> • Boreal Toad 	<ul style="list-style-type: none"> • Pine Marten

Migratory Bird Treaty Act (16 USC 703-711)

Migratory bird species are protected from harm under the Migratory Bird Treaty Act (MBTA)(16 USC 703-711). A January 2001 Executive Order requires federal agencies to ensure that environmental analyses of federal actions evaluate the effects of actions and agency plans on migratory birds, with an emphasis on species of concern. This analysis is located in Appendix A.

Presidential Executive Order 12962 (June 1995)

Presidential Executive Order 12962, signed June 7, 1995, further supports the purpose of the Fish and Wildlife Act of 1956, the National Environmental Policy Act of 1969, and the Fish and Wildlife Coordination Act, to conserve, restore, and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. The order states:

“Federal agencies shall 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.”

A discussion of aquatic resources can be found in this chapter of the EA, under Issue 1.

Clean Water Act

The Clean Water Act provides the overall direction for the protection of the nations waters from both point and non-point source of water pollution. The Montana Water Quality Act establishes general guidelines for water quality protection. It requires the protection of states water as well as the full protection of existing and future beneficial uses. All of the streams within the analysis area for the proposed Shields River Road improvement 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, waterfowl and furbearers; agricultural and industrial water supply.”

A discussion of water quality can be found in this chapter of the EA, Chapter III, Issues Described In Detail, under Issue 1.

Heritage Program Laws

Several Federal laws provide for preservation of historic, prehistoric, and other cultural resources. These include the National Historic Preservation Act (NHPA), the American Indian Religious Freedom Act (AIRFA), and the Native American Graves Protection and Repatriation Act (NAGPRA). These laws essentially require that adequate and extensive review of these undertakings be conducted in order to assess the possible effects of these activities upon cultural resources. They also provide that Federal agencies conduct adequate consultation with pertinent tribes in order to be informed of any possible conflicts an undertaking would have on their ability to conduct traditional religious practices.

The project area has been surveyed for the presence of cultural resources. These surveys have not found any cultural resources. Road improvements are proposed within the existing easement across private land. Mitigation measures to protect cultural resources will be incorporated into the construction contract. The likelihood of harming cultural resources by implementing this project is remote. The pertinent tribes were contacted during the scoping stage for the project and they did not express any concerns to the Forest Service. Therefore, the proposal to improve the Shields River Road in this area is consistent with these laws.

State Laws

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

The State of Montana Water Quality Act requires the state to protect, maintain, and improve the quality of water for a variety of beneficial uses. Section 75-5-101, MCA established water quality standards based on beneficial uses. The Department of Environmental Quality designates all surface waters within 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

A discussion of water quality can be found in this chapter of the EA, Chapter III, Issues Described In Detail, under Issue 1.

Other Required Disclosures

Unique Characteristics of the Geographic Area

The project area lies 12-13 miles northeast of the town of Wilsall, MT. Improvements would be made to the existing Shields River Road #844 in Section 25, T5N R9E and Sections 26-30, T5N R10E, MPM. In addition, the existing bridge across Deep Creek on National Forest land near the center of Section 26, T5N R10E, MPM, would be replaced. A parking area would be constructed proximate to the junction of the Shields River Road # 844 and the Sunlight Road #6630, Section 26, T5N R10E, MPM. A gravel pit would be developed on National Forest land adjacent to the Sunlight Road in Section 26, T5N R10E, MPM.

There are no Wild & Scenic Rivers or ecologically critical areas known to occur in the project area. Approximately 0.086 acres of Palustrine Forested Wetland and 0.383 acres of Palustrine Shrub wetland or a total of 0.469 acres would be impacted by road fill, all within the existing Shields Road right-of-way. The Palustrine Shrub wetlands are Corps of Engineers jurisdictional wetlands and will require wetland mitigation of 0.58 acres or wetland replacement on National Forest lands in the Shields River watershed.

Most of the proposed road improvements would occur where the Shields River Road crosses private land and there would be no effects to either wilderness or roadless areas.

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

Rangelands are present adjacent to the Shields River Road where it crosses private land in Section 25, T5N R9E and Sections 26-30, T5N R10E, MPM.

Road improvements are proposed within the existing road easement across private land.

Farmlands and forestland are not present within the areas directly affected by the proposed road improvements. A parking area and a gravel pit are proposed for development on lands classified as Management Area 8, Timber Management, in the Gallatin Forest Plan. These developments will not preclude site restoration to a productive state in the future.

Effects of Alternatives on Floodplains and Wetlands

Road improvement construction will occur within short segments of the floodplains of the Shields River, the South Fork of the Shields River and Deep Creek. Best Management Practices will be applied to minimize short-term effects to water quality during construction. The placement of aggregate on the road surface would increase infiltration and decrease erosion from the road surface. Thus, a short-term increase during the construction period would be offset by long-term reductions in sediment delivery, especially near the Shields bridge site where sediment delivery to the Shields River has been a problem. Long-term reductions in fine sediment delivered to the stream would have a beneficial effect on Yellowstone cutthroat trout habitat. The majority of the road reconstruction would occur on relatively flat areas, which are not hydrologically connected to the Shields River and would not deliver sediment.

The gravel pit proposed for development proximate to the Sunlight Road would be internally drained and sufficiently separated from Sunlight Creek, Shields River and their tributaries to not be a source of sediment.

Approximately 0.086 acres of Palustrine Forested Wetland and 0.383 acres of Palustrine Shrub wetland or a total of 0.469 acres would be impacted by road fill, all within the existing Shields road right-of-way. The Palustrine Shrub wetlands are Corps of Engineers jurisdictional wetlands and will require wetland mitigation of 0.58 acres or wetland replacement on National Forest lands in the Shields River watershed.

Effects of Alternatives on Social Groups

None of the action alternatives will have discernible effects 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.

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

Short-term uses are those uses that generally occur annually. Long-term productivity refers to the ability of the land to produce a continuous supply of

a resource. Minor amounts of soil loss and displacement would occur as a result of any of the action alternatives. Application of the Soil Protection Guidelines and Best Management Practices in Appendix B would ensure this project would maintain long-term soil productivity in the area of a proposed gravel pit on National Forest land. These measures are also adequate to keep impacts within acceptable limits. Impacts to other resources (wildlife and vegetation) are limited in time and intensity and would not deplete their long-term productivity.

Irreversible and Irretrievable Commitment of Resources

An *irreversible* commitment of resources refers to the use or commitment of a resource that are incapable of being reversed or changed. For example, nonrenewable resources, such as native rock crushed to make gravel, would be removed forever during crushing and would be irreversibly lost or committed. Irretrievable commitment of resources refers to actions that result in changes to resources that cannot be recovered or regained. A gravel pit is proposed for development on lands classified as suitable for timber production. Mitigation measures have been identified to assure the site can be reclaimed to a productive state.

The temporary sediment increase associated with reconstruction of the Shields River Bridge, Deep Creek Bridge, and South Fork Shields culvert, although brief and localized, is an irretrievable commitment of resources since the sediment will enter the Shields river system and be transported downstream.

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

None of the alternatives discussed in this EA would be inconsistent with the objectives of Federal, Regional, State, and Local land use plans, policies, and controls for the project area. The Park County Comprehensive Plan does not apply to National Forest lands in the project area. See the Endangered Species Act discussion below.

Energy Requirements and Conservation Potential of Alternatives

The energy required to implement Alternatives A or B in terms of use of petroleum products is insignificant when viewed in the context of production costs and the effect on national and worldwide petroleum reserves.

Probable Adverse Environmental Effects That Cannot Be Avoided

Implementation of the proposed road improvements will result in the loss of approximately 0.469 acre of Palustrine wetlands. Reclamation of any disturbed sites is proposed in association with crushing native rock and road related activities.

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 practical and permitted by law, all populations are provided the opportunity to comment before decisions are rendered or are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by government programs and activities affecting human health or the environment (RO 13898 and Departmental Regulation 5600-2).

III. ISSUES DESCRIBED IN DETAIL

Issue 1: Proposed road improvements could increase sediment delivery, modify riparian and wetland vegetation characteristics, and/or modify stream channel and watershed hydrology and affect habitat for aquatic biota.

Indicator: Sediment yields as measured in tons/year and % over natural compared to sediment guidelines established for Gallatin National Forest streams for fisheries protection. Channel geometry analysis at the Shields bridge site, and delineation of wetland areas affected by road reconstruction activities. Area of wetlands impacted by road fill.

Concern: Road reconstruction activities have the potential to increase sediment yield to Shields River tributaries that could have adverse impacts to aquatic biota. Increased fine sediment in streams has been shown to reduce spawning habitat quality for fish. The road reconstruction would also affect wetlands along the road corridor.

Road improvement can disturb soils and overland flow regimes, which in turn increases the potential for erosion and sediment transport to streams and other water bodies. Increased fine sediment in streams can reduce habitat quality and cause adverse effects to fish, amphibians, and other aquatic biota. Specifically, increased sediment delivery rates may increase the proportion of fine sediments (< 6.3 mm) in salmonid spawning gravels and may in-fill pools functioning as rearing and overwintering habitats (Chapman and McLeod, 1987). Increased sediment delivery rates may also in-fill breeding, rearing, and over-wintering habitat for sensitive amphibians.

Road improvement activities, including bridge widening and extending fill slopes can both directly and indirectly disturb amphibians and their habitat. Wetlands and other water bodies used for breeding, rearing and overwintering can be destroyed or disturbed.

Because this proposal does not call for removing vegetation from the riparian area, potential effects to those habitat attributes related to riparian vegetation need not be analyzed. This includes large woody debris recruitment, alteration of stream temperatures, and changes of stream bank stability from near bank activities.

Affected Environment

The Watershed Condition in the Shields River on the Gallatin NF was extensively evaluated in 1993 (USFS, 1993) and in 1999 for GIS layer updating. The 1993 analysis indicated that the Shields River watershed had several sub-watersheds with extensive roading and timber harvesting. Many of the roaded and harvested areas were on private land, which was purchased in the early 1990's. In 1993, 1994, and 1995 about 50 miles of roads on National Forest land were obliterated in the upper Shields River drainage. This has resulted in a recovering upper Shields watershed, reduced sediment input, and re-vegetating timber harvest and road corridors. An updated 1999 GIS layer indicated that for the 43.6 mi² upper Shields River watershed (South Fork of the Shields and upstream), has about 89 miles of roads, 89 miles of streams, 69 road stream crossings, 760 AUM's, and has about 15% in harvest units with greater than 69% crown removal. Current Upper Shields river sediment levels are estimated to be about 19% over natural with the R1R4 sediment model. Data for this estimation was gathered at an accounting point just below the confluence with the South Fork of the Shields River.

The Montana DEQ 2002 303(d) list at <http://nris.state.mt.us/wis/TMDLApp/TMDLReport2002> lists the Shields River upper segment (41.6 miles) from the headwaters to Cottonwood Creek as partially supporting beneficial uses for aquatic life support, cold water fishery, and primary contact recreation. Probable causes for the finding of partial support include bank erosion, dewatering, flow alteration, other habitat alterations, riparian degradation, siltation from agriculture, grazing, silviculture, hydro-modification, and flow regulation/modification. At the project area the primary cause of impairment is historically upstream timber harvest (silviculture).

The proposed road reconstruction corridor is on relatively flat, glacial outwash terrace. The road corridor does not drain directly into the Shields River except at the Shields River Bridge, South Fork Shields River culvert, and at Deep Creek. The existing road near the Shields River Bridge contributes sediment to the stream during wet conditions. During spring snowmelt and spring/summer rain, the road is muddy, and vehicle traffic often results in ruts. Sediment delivery from the existing road near the bridge site is high.

The Shields River at the Shields River road crossing is a Rosgen (1996) stream channel type B4c above and B4 below. If the channels were just slightly wider they would be C4 and C4b channel types. Pebble counts were a D50 of 42mm above the bridge and 53mm below with a Riffle Armour Stability Index (RASI) (Kappesser, 1993) of 99 above and 94 below the bridge. Channel slopes

averages 1.8% above the bridge and 2.1% below. Measured bankfull widths of the Shields River at the bridge site varied from 49 to 77 feet. The cross sections, pebble counts, RASI, channel typing, and channel geometry measurements indicate that the Shields river channel above the Shields road bridge has less grade (although not statistically separable), is wider, has larger particle size and higher RASI number than below the bridge. Aerial photographs of the Shield River channel for several miles above and below the bridge indicate similar meander patterns and depositional reaches, particularly in the inside of meander bends.

Flood frequency was calculated at the Shields River bridge site, the South Fork of the Shields River culvert site at the Shields River road, and the Deep Creek bridge site at the Shields River road using regional flood regression equations based on watershed area and average basin elevation (Omang, 1992).

The following table describes the rates of flow in Cubic Feet per Second (CFS) for flood events that would be expected to occur in periods of 10 to 500 years. For example, a flood that might occur in the Shields River in any ten-year period is modeled at a rate of flow of 657 CFS. A much more severe flow could occur, but it would be much less likely to happen as often as one of substantially less volume. A flood event that might occur on the Shields River in any five hundred year period is modeled at 1,505 CFS, or somewhat less than three times the flood volume of an event that would be expected to occur in any ten-year period.

Table 3-2: Rates Of Flow For Flood Events On the Shields River, South Fork of the Shields River and Deep Creek

Site	Watershed area (mi ²)	10 Year Period (cfs)	25 Year Period (cfs)	50 Year Period (cfs)	100 Year Period (cfs)	500 Year Period (cfs)
Shields River	59	657	803	936	1134	1505
South Fork Shields	10	168	216	261	327	475
Deep Creek	7.4	133	172	209	264	389

These modeled flow volumes substantiate a need to bring aging drainage structures to a standard that incorporates Best Management Practices. Replacing aging drainage structures (culverts), modifying the Shields River channel immediately upstream from the Shields River Bridge and replacing the bridge on Deep Creek will prevent unnecessary and unacceptable adverse environmental impacts to water quality resulting from the flood event. The culvert on the South Fork of the Shields River has been observed to be too small to accommodate even normal spring flows. Modifications to the Shields River stream channel are needed to protect the improved road from damage during periods of high stream flow as described in the table. The Deep Creek bridge

abutments are subject to erosion during normal flows. Current standards call for bridges to be designed to withstand a 100-year flow and the proposed improvements will bring these structures into compliance with the standards, including Best Management Practices (BMP's) designed to maintain water quality.

The current Shields Road project crosses 6 areas of wetlands. Beginning at the projects most western end the road crosses a Cowardin (1979) Palustrine Forested wetland at mile 0.1 to 0.3. This wetland is about 19 acres in size. From mile 0.45 to mile 0.75 the road crosses a Cowardin (1979) Palustrine Shrub wetland, which is about 117 acres in size and connects to Riverine wetlands along Meadow Creek to the north. From mile 1.15 to 1.25 an irrigation ditch overflow then connects to a 2nd Cowardin (1979) Palustrine Shrub wetland that is about 30 acres in size. The Palustrine Forested wetlands develop primarily from water upwelling within the wetland with an ephemeral ditch overflow to the Palustrine Shrub wetlands. The Palustrine shrub wetlands also develop primarily from water upwelling with some augmentation occurring from an early season irrigation ditch from the Shields River. Very localized Riverine wetlands occur at the Shields River Bridge site (mile 2.6), South Fork Shields (mile 3.3) and at the Deep Creek Bridge at mile 5.5.

Yellowstone cutthroat trout (YCT) inhabit the Shields River drainage and many of its headwater tributaries. Yellowstone cutthroat trout are considered a *Sensitive species* by the Forest Service and *Species of Special Concern* by the Montana Department of Fish, Wildlife and Parks. Primary causes for decline throughout their historic range include competition and hybridization with introduced non-native salmonids, habitat degradation, and population fragmentation. Genetic testing of YCT in the upper Shields drainage shows genetically pure fish inhabiting the Shields River upstream from the Smith Creek confluence and many headwater tributaries. The YCT population in lower reaches is comprised of hybridized and unhybridized individuals. Brook trout are also common in many headwater streams throughout the drainage and have displaced YCT.

Direct/Indirect Effects

Alternative A - Proposed Action with a Gravel Pit On National Forest

Alternative A would improve subgrade, widen, and place 4" of aggregate on the Shields river road. Ditch relief culverts would be replaced. The Shields River bridge would be widened and existing fill riprap pulled back to flush with the bridge abutments. Removing existing fill riprap at the bridge abutments would increase channel width and capacity. Channel width after fill removal would approximate natural bankfull channel widths. The South Fork Shields culvert would be upgraded and replaced and the Deep Creek Bridge would be replaced. These treatments would result in temporary sediment increases during road re-grading, ditch replacement, and culvert replacement due to disturbance in and near the stream channel. The placement of aggregate on the road surface would increase infiltration and decrease erosion from the

road surface. Thus, a short-term increase during the construction period would be offset by long-term reductions in sediment delivery, especially near the Shields bridge site where sediment delivery to the Shields River has been a problem. Long-term reductions in fine sediment delivered to the stream would have a beneficial effect on Yellowstone cutthroat trout habitat. The majority of the road reconstruction would occur on relatively flat areas that are not hydrologically connected to the Shields River and would not deliver sediment.

Approximately 0.086 acres of Palustrine Forested Wetland and 0.383 acres of Palustrine Shrub wetland or a total of 0.469 acres would be impacted by road fill, all within the existing Shields road right-of-way. The Palustrine Shrub wetlands are Corps of Engineers jurisdictional wetlands and will require wetland mitigation of 0.58 acres (1.5 to 1) wetland replacement on National Forest lands in the Shields River watershed. Since the Forest Service is a Federal agency, Wetland Executive Order (EO) 11990 requires replacement in kind with no net loss of wetlands. Coordination is ongoing with the Army Corps of Engineers, Helena Office, for wetland mitigation permitting and mitigation. The Corps has directed the Gallatin NF to submit a Section 404 wetland permit application when the location of proposed mitigation is finalized. This will occur during the summer of 2004. The Corps has suggested expanding an existing Palustrine Shrub wetland within the Shields River drainage on National Forest lands laterally by 0.58 acres by removing surface confinements to groundwater table extension. The Corps will review the proposed mitigation application, and specify needed changes if any to the proposed mitigation plan before approving the mitigation project. The wetland mitigation must be completed within 1 year of road project completion and must be effective within 3 years. The resulting wetland area may need some transplanting of sedges and shrubs to establish wetland vegetation. Some shaping and leveling would be necessary to allow the 0.58 acres of wetland mitigation area to become saturated from the adjacent wetland to be expanded. The wetland mitigation area would be internally drained and would not pose off-site water quality impacts. The type of mitigation proposed is routine for Montana Department of Highways wetland mitigation projects.

The gravel pit near the Sunlight Creek Road would be internally drained and sufficiently separated from Sunlight Creek, Shields River, and their tributaries that it would not be anticipated to be a sediment source.

During internal scoping a fish passage issue surfaced regarding the South Fork Shields culvert replacement. The existing culvert was thought to be a barrier to fish passage precluding non-native brook trout from populating the stream. Population surveys and genetic analysis conducted in 1992 showed that genetically pure Yellowstone cutthroat trout were the only species present on National Forest in the South Fork Shields watershed. Considering the competitive exclusion potential of non-native brook trout species occupying habitats below the culvert, there was concern that replacing the

culvert with one that allowed for fish passage could be detrimental to the YCT population in the South Fork Shields. Brook trout populations have expanded in other similar streams in the upper Shields drainage (i.e., Deep Creek, Bennett Creek, Smith Creek). Population surveys conducted during summer of 2003 immediately above the culvert revealed the presence of brook trout in low densities (Brad Shepard, MFWP personal communication). Based on discussions with Joel Tohtz, MFWP Fisheries Biologist, the state's preference is to replace the culvert with one that allows for fish passage. Because brook trout currently occupy habitat upstream of the culvert, species composition would not change upstream of the culvert. The presence of brook trout in the upstream reach suggests that the existing culvert is not a fish passage barrier.

Alternative B – Proposed Action with a Gravel Pit Not on National Forest

Alternative B water resource effects are identical to Alternative A except that the gravel pit near the Sunlight Creek road would not be constructed in lieu of gravel purchase from private land. Since the gravel pit is internally drained with no sediment effects no water quality impact reduction occurs in Alternative B relative to Alternative A.

Alternative C - No Action Alternative

The No action Alternative would avoid the limited, short-term sediment impacts discussed above during road construction. This alternative would not result in long-term sediment reductions from aggregate placement on the road surface. The aggregate would increase infiltration and decrease erosion from the road surface. Therefore, this alternative would have slightly higher long-term sediment impacts than alternative A.

The No Action alternative would not have the road fill impacts to the Palustrine Forested and Palustrine Shrub wetlands and would not require wetland mitigation.

Cumulative Effects

The temporary sediment impacts from bridge improvements and culvert replacement at the Shields River Bridge, South Fork Shields culvert, and Deep Creek Bridge site would be cumulative with existing sediment yields in the Shields River system, currently estimated at 19% over natural. Sediment impacts associated with this project are expected to be quite limited in amount and duration and would not be measurable except during construction. The project is expected to slightly reduce sediment yields in the long term due to reduced erosion from the Shields River road. The gravel pit will be internally drained so is not anticipated to result in cumulative sediment impacts. Long-term

sediment reductions would result in a beneficial effect to Yellowstone cutthroat trout habitat.

Consistency with Laws, Regulations, and Policy

The Gallatin Forest Plan, Forest Wide Standards 10.2 (page II-23) requires that Best Management Practices (BMP's) will be used in all Forest watersheds. The Gallatin BMP's are contained in USFS (1987) and were used in the mitigation measures section (Appendix B). Forest Plan standard 10.5 (page II-23) requires compliance with Executive Order 11990 (Protection of Wetlands). Forest Plan Direction A.5 (page II-1) requires the Gallatin NF to meet or exceed State of Montana water quality standards.

Forest Plan standards for fisheries include:

- Habitat that is essential for species identified on the *Sensitive Species* list developed for the Northern Region will be maintained to manage these species (FP p. II-17).
- The Forest will be managed to maintain and where feasible, improve fish habitat capacity in order to achieve cooperative goals with the Montana Fish, Wildlife, and Parks. (FP p. II-17).

All action alternatives are consistent with the State of Montana Water Quality Act as well as other applicable laws, policies, and the Gallatin NF Forest Plan. Best Management Practices (Appendix B in this document) will be employed under all alternatives to ensure consistency with these protection measures. Specific Montana water quality standards which will be met include: Administrative Rules of Montana 17.30.623 (1) which requires that water classified as B-1 (applies to the Shields River and tributaries) after conventional treatment are suitable for growth and propagation of salmonid fishes and associated aquatic life and 17.30.623 (2) (f) which does not allow increases above naturally occurring concentrations of sediment which renders the waters harmful to public health, recreation, safety, livestock, fish, or other wildlife.

Wetland evaluation and mitigation is being conducted in accordance with the US Army Corps of Engineers requirements. Wetland evaluations were done using the COE (1987) jurisdictional manual, which requires a combination of hydric vegetation, wetland soils, and water regimen to be present to be a jurisdictional wetland. Design of wetland mitigation is being done in accordance with the COE (02/06/04) Regulatory Guidance Letter, which provides the guidance for wetland functional assessment and wetland mitigation specific to the Shields River Road Improvement project. The Shields River Bridge, Deep Creek Bridge, and South Fork Shields culvert wetland impacts are sufficiently limited to be permitted under Nationwide Permit #14 Linear Transportation Crossings (COE, 2003). A 124 (Montana Stream Protection Act) permit will be required from the Montana Fish, Wildlife, and Parks for the Shields Bridge, SF Shields culvert, and Deep Creek bridge replacement sites.

Irreversible and Irretrievable Commitments of Resources

No water or wetland impacts would occur with the Shields Road project, which would be irreversible. The wetland impacts (fill of 0.469 acres) are a shallow (0.5 to 2') fill over a 6' wide wetland corridor within the road right of way. The fill material could be removed and wetland function restored. The temporary sediment increase associated with reconstruction of the Shields River Bridge, Deep Creek Bridge, and South Fork Shields culvert although brief and localized, is an irretrievable commitment of resources since the sediment will enter the Shields river system and be transported downstream.

Issue 2. Invasive Plant Species: Proposed road improvement activities will create areas of disturbed, bare soils. These areas could become revegetated by invasive plant species.

Indicator: Evaluate existing infestations, predict effects of project activity and monitor for post-project treatment needs.

Concern: Invasive plant species, including noxious weeds, have a competitive advantage over native species. Non-native species have few, if any, predators or effective competitors and they can quickly occupy areas of raw soil, especially those that are tributary to roads and trails. Once established, non-native species will remain dominant unless and until artificial means (spraying, physical removal, introduced predators) are employed with sufficient intensity and over a long enough period of time to eliminate the introduced population. These means are often labor intensive and expensive.

Scale of Analysis: The analysis area for evaluating effects of this project on invasive plant species includes the full extent of disturbed soils, including areas disturbed during the course of construction. We will also be looking at existing infestations that could provide a source of seed.

The temporal scale for effects analysis includes the growing season immediately preceding construction and the period of active construction. Monitoring and follow-up treatments, if needed, will continue following construction. The Forest Service will continue monitoring for up to three years, with direct treatment, following construction to assure that Park County does not inherit a weed problem arising from construction activities.

Affected Environment

Approximately 5.6 miles of roadside would be affected. Up to 20 ft. of the shoulder of the road on both sides could have existing vegetation removed during the construction process. In addition, areas along the Shields River Road could also have areas of vegetation removed from activities associated with the bridge replacement on the Shields River and Deep Creek and the proposed culvert replacement. If a gravel pit were constructed off of the sunlight Road,

approximately 3 to 5 five acres would be affected.

Although these disturbed sites would be the likely places for noxious weeds to become established, the affected environment could be greater: Adjoining areas could also be affected in the long term should weeds become established on the disturbed sites.

Currently, the following noxious weed species exist in the immediate vicinity; Canadian thistle (*Cirsium arvense*); spotted knapweed (*Centaurea maculosa*) houndstongue (*Cynoglossum officinale*); and musk thistle (*Carduus nutans*).

The knapweed and Canadian thistle are located primarily along the shoulders of the road. Houndstongue and musk thistle are located both on the road shoulders and into adjoining private pastureland.

Direct, Indirect Effects

Alternative A – Proposed Action with a Gravel Pit On National Forest

This alternative calls for improvements on 5.6 miles of road, and the construction of a gravel pit. The potential exists to have vegetation removed for up to 20 feet outside the road surface on each side of the road. This totals approximately 26 acres of ground that could have some level of disturbance or vegetation removal. This coupled with 3 to 5 acres of vegetation removal associated with the gravel pit, would bring the total of potentially disturbed areas to approximately 30 acres.

Upgrading the road has the potential to slightly increase the amount of vehicular use on the forest. This increased use would slightly increase the risk of new weed infestations becoming established through seeds being brought in on vehicles. The overall risk from using the Northern Region Risk Assessment Rating Procedure is “moderate” (project file).

The following measures would be taken to reduce the risk of introducing noxious weeds and other invasive species:

Requirements to be Included in the Road Contract

- A source of gravel, whether on National Forest or private land, will be examined by the Forest Service and certified for use as a condition of accepting material from the site.
- All off road equipment will remove all mud, dirt, and plant parts before moving into project area. Cleaning must occur off National Forest lands and equipment will be inspected by the Forest Service before entering the project area. (This does not apply to service

vehicles that will stay on the roadway, traveling frequently in and out of the project area.)

- If operating in areas infested with new invaders, all equipment will be cleaned of weed seeds in a designated area prior to leaving the project site, to prevent spread of weeds.
- Disturbed sites will be revegetated using native certified weed free seed where appropriate and available. Revegetation may include planting, seeding, fertilization, and weed-free mulching as appropriate.
- Existing sources of weed seed that could be picked up by passing vehicles and transported to the construction areas will be treated before construction begins.
- Straw used for road stabilization and erosion control will be certified for use by the Forest Service.
- Minimize the removal of trees and other roadside vegetation during construction, particularly on southerly aspects. Shading by established vegetation helps prevent invasive plant species from becoming established.
- Existing weeds on areas likely to be disturbed by construction activities will be treated with herbicides before construction, where practical.

Forest Service Responsibilities

- Disturbed sites will be monitored by the Forest Service for up to three years after project completion. The Forest Service will treat weeds as necessary.
- Appropriated dollars will provide financing of post construction activities. Following a reasonable period to allow for treatment of new infestations following construction (up to three years), Park County will assume responsibility for regular weed monitoring and control.

Alternative B – Proposed Action with a Gravel Pit Not On National Forest

This alternative is essentially the same as Alternative A, with the exception being that the gravel pit would not be constructed on National Forest land, and aggregate for the project would be transported in from a privately owned,

commercial source. As a stipulation in the construction contract, the Forest Service would require any source of aggregate be certified weed free.

The amount of potentially disturbed areas associated with this alternative would be up to approximately 26 acres along the road corridor and the areas around the bridge construction. This alternative would have similar effects on invasive species as Alternative A except a smaller area would be impacted.

Alternative C – No Action

Alternative C, No Action, would have no direct effects on the area. The road would not be upgraded, the gravel pit would not be constructed, there would be no new ground disturbance associated with the project, no increase in vehicular use associated with an improved road, and thus no increase in the potential for the spread or establishment of noxious weeds.

Cumulative Effects

The effects of disturbing up to 30 acres of vegetation, couple with the presence of four species of noxious weeds in the area, would provide for a “moderate” risk of new infestations becoming established. As a result, several management measures to reduce the risk of introduction or spread of undesirable plants into the area have been adopted. These are listed in Chapter 2, Features Common to All Alternatives, Noxious Weeds.

Consistency with Laws, Regulations, and Policy

The eradication and prevention of the spread of noxious weeds as outlined is consistent with the Forest Plan. Forest Wide Standards listed in Chapter II, page 28 states that an integrated approach to confining present infestations and preventing the establishment of new ones will be used.

The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) as amended in 1977, requires that applicators of Restricted Use pesticides be used only by or under the supervision of certified applicators. Treatment of weeds associated with this project, either by Forest Service Personnel or by a contractor will meet these requirements.

Irreversible and Irretrievable Commitments of Resources

Management to contain the spread of noxious weed is not expected to have any irreversible or irretrievable effects on other resources. Direct weed treatments would be expected to kill individual plants.

Issue 3: Increased road width and the application of road surfacing adequate to support four-season use may result in increased recreation use of lands accessed by the Shields River road.

Indicator: Visitor use data gathered by backcountry rangers. Information is available from visitor encounters, campsite inventories, weed surveys, trail inventories, and use records for the Bennett Creek Cabin.

Traffic counter results since the early 1990's.

It is not possible to segregate an increase in vehicles per day that is attributable to an improved road surface from the continuing, general increase in recreation visits occurring on the Gallatin National Forest. For this reason we will assess environmental impacts on National Forest resources, including roads and trails, from a foreseeable increase in the period of use – the improved road will be safely driven earlier in the spring and later into the fall.

Concern: The concern is that widening the road and improving road surfacing will contribute to increased numbers of recreationists visiting the Shields River basin. Increased recreation use will, in turn, lead to additional maintenance needs for the trail and road system tributary to the Shields River road.

Affected Environment

The Shields area receives moderate recreation use during the months of June through September as evidenced by the number of vehicles at pullouts, at dispersed campsites, and use records for the Shields Campground, Bennett Creek Cabin, trailheads and the trail system. In the early 1990's, a traffic counter was placed along the Shields River Road #844 for a portion of the summer season. The resulting ADT (average daily traffic) estimates showed 250 ADT on the first 1.5 miles – to the junction of the Smith Creek Road, where the traffic splits. Above the Smith Creek junction, the ADT falls to approximate 130 ADT. It is estimated that 80% of the upper Shields River residential users take the Smith Creek Road to their residences, 20% use the Shields River road for residential access. The recreational and administrative uses on the other hand split 30% Smith Creek and 70% Shields River road.

Hunting tends to be the most popular activity during the fall and draws a number of visitors into the Shields River watershed. The hunting level is considered moderate to high in comparison to other hunting areas on the Livingston Ranger District.

Over the past 3 years, backcountry rangers have gathered data from visitor encounters, campsite inventories, weed surveys, and trail inventories. They have also monitored the number of people who have rented the Bennett Creek Cabin for the last ten seasons. This data indicates that recreational use has been rising in the Crazy Mountains. Data from backcountry campsite inventories has

indicated that more sites are being developed and the size of existing sites has grown in perimeter. An increasing number of visitors have been encountered on various trails and at trailheads in the Shields area. In addition, the Rainbow Group continues to hold an annual gathering of 20-70 persons in either Cottonwood Creek or the Shields River Camp.

In 1996-1996, the Big Sky Snowmobile Club groomed the Shields Loop every 3 or 4 weeks. In 2001-2002 the loop was groomed once a week. Winter patrols to the Bennett Creek Cabin and also on the Shields groomed snowmobile loop indicate an increase in winter recreation. Aerial flights have also indicated an increase in snowmobile use in more remote areas of the Crazy Mountain Range.

Overall, recreational use is on the rise nationally. This trend is true for the Gallatin National Forest and in the Crazy Mountain Range. There has been an increase in use, which correlates to an increasing population in Gallatin, Park and Meagher counties. Residents are looking for more weekday and weekend places to recreate. Likewise, non-residents visit the Shields area for vacations and continue to return. The Forest is observing an influx of vehicles with license plates from Billings, Bozeman and Livingston and from Minnesota, Wyoming and Idaho.

Direct, Indirect and Cumulative Effects

Increases in the number of recreationists using public lands in the Shields River drainage have been observed and documented for a number of years before the opportunity arose to improve the Shields River Road. This assessment addresses whether future changes in the period of use of the road are directly attributable to the road improvements, and, if so, whether the increase would be expected to result in more frequent or more extensive maintenance of the road and trail systems.

Alternative A- Proposed Action with a Gravel Pit On National Forest

With the improvements of the Shields Road, there may be some increase in use since the roads could be more safely traveled during wet conditions. Some of these users are currently discouraged from driving up the road due to the existing conditions, especially in the late spring and fall. Other more adventurous drivers continue on the road and create deep ruts. By paving the road for another 1.5 miles and then graveling the road surface for another 3.8 miles to the Forest boundary, many of these individuals would not rut the road. Improving the road would eliminate the incentive for drivers to avoid ruts and other surface damage by driving off the travelway.

Signing the road through private properties and providing visitors with information about the road easement through private land ownerships would better direct travelers looking for an opportunity to recreate on National Forest lands.

Many ATV / OHV users, or 4x4 vehicle users are not deterred by the muddy, rutted surface of the Shields and Smith Creek Roads. There is not a direct connection between graveling the road and an increase of ATV/ OHV users. With normal increases in use on the Shields River Road, the road ruts could become worse. Graveling the road surface would reduce continued resource damage resource damage and better support recreation use

The current Forest Service gate is on private land in the west half of Section 26. This action would move the gate onto Forest Service lands in the east half of Section 26. At this location, a winter/spring parking area would be constructed at the junction of the Sunlight Road #6630 and the Shields River Road. A second gate would be installed on the Sunlight Road. These gates would continue to be closed on a seasonal basis to protect the roads from damage during poor driving conditions and also to supplement winter recreational activities.

Installing the gates and developing a parking or turn around area will allow people to turn around on public lands if they are uncomfortable with road conditions. It also provides an option to close the gates earlier than the current dates or open later in the year due to poor conditions.

The road improvement may bring more recreationists to other trailheads on the Loop Road or in the Smith Creek Area. If the Shields River Road is plowed to the proposed winter/spring trailhead, recreational use will probably increase. This is due to a shorter, easier ski for many individuals to destinations such as Bennett Creek Cabin and potential ski opportunities up the Sunlight Road and into Sunlight Basin. If the Shields River Road is not plowed to the trailhead, non-motorized use such as skiing will stay the same or increase gradually. Winter use on the Loop Road has been increasing through the years and will continue regardless of this proposal due to national, regional and local trends.

Alternative B – Proposed Action with a Gravel Pit Not On National Forest

A decision to purchase gravel from a commercial source, rather than develop a site on National Forest land, would not affect the numbers of visitors to National Forest lands differently from what has been disclosed for Alternative A.

Alternative C – No Action

As discussed in the two action alternatives, recreation use would continue to increase under this alternative. The current parking area at milepost 1.5 in Section 20 is located on private land. This site will continue to be the winter parking area as long as the landowner continues to allow access. The County has plowed the parking area in the past. If the option to park on

private land goes away, snowmobiling and skiing access would be more limited.

Facilities at a winter/spring parking area would not be installed. This would eliminate a place for people to have a turn around on National Forest. It would also eliminate the opportunity to post information on a bulletin board that emphasized environmental education, regulations and informed visitors of trail and road status. The parking area would also be a primary stopping point that could feature a map of the area showing which routes are open or closed to motorized use. The toilet would not be installed and human waste concerns would remain an issue at the current winter parking area on private land as well as on National Forest.

The Shields Road will continue being used by various recreationists in the summer. Most use occurs on weekends and during fall hunting season. Hunters would continue to use dispersed campsites along the Shields and the Smith Creek Roads. The dispersed campsites in the upper stretches of the Shields basin would continue to be very popular during hunting season. Deep ruts tend to re-occur during hunting season on the Upper Smith Creek and Shields roads. The road surface would remain damaged until the Forest graded the road in the spring. Tenuous travel conditions would continue for all types of vehicles due to the side slopes and soil types creating slick conditions.

When the roads in their current state (without gravel and drainage) are dry, Smith Creek and the unpaved and ungraveled portion of the Shields Road are suitable for 2WD low clearance passenger cars. Some drivers may be discouraged from driving the road because of the severe rutting. During wet periods, however, more recreationists might be discouraged from driving up the road if there were no gravel on the 5.3-mile proposed stretch. Landowners would continue rescuing those individuals who got stuck. They would also continue dealing with impacts to their property. Other recreationists would nevertheless continue to push through mud and ruts with their high clearance 4x4s, widening and rutting the road /shoulders even more. Due to the current location of the gates, people drive the 5.1 miles and often get stuck. Recreationists also have driven during early spring thaw or in the winter and have gotten stuck numerous times due to seasonal storms and snowdrifts over the road. Likewise users will continue driving ditches to avoid sliding off the road prism and down the embankment. The private landowners beyond the end of the Smith Creek Road and up the Shields Loop would most likely continue to use the upper stretch of roads even if it was not graveled and drained.

With the trailheads and junction parking not delineated, recreation users would most likely tend to spread out or disperse their parking more than with structured parking, which would create a more rustic, less developed, and less regimented recreational setting.

Cumulative Effects

Much of the private land in the Shields and Smith Creek area repeats the checkerboard pattern of alternating public and private land dating back to ownership by the railroad. With the Galt Land Purchase, the Forest Service acquired a number of these sections, partly as a way to bring public lands together in more readily manageable blocks. Today, there are close to 80 landowners in the Smith Creek area. However, most recreationists still enjoy a fairly semi-primitive setting along the upper road stretches. Potential future development on the private lands, some of which have been subdivided, could change the access and setting that currently exist, regardless of whether the upper road stretches are graveled. Some of the popular traditional, dispersed, user-built camping and parking areas are actually located on private lands. Making an effort to provide parking on National Forest, with information on land ownership with signing would prove to be prudent in this situation.

Consistency with Laws, Regulations, and Policy:

The Forest Plan sets standards for resource management in the project area. This area falls under Management Areas 7 and 8. The Smith Creek Road #991 and the Shields Road #844, lie within recreational settings defined as roaded natural appearing and roaded modified. These roads access other National Forest lands that provide a semi primitive motorized, semi-primitive non-motorized and primitive types of experiences.

The Forest Plan states under Resource/Activity summaries on p II-2 for Recreation:

- Activities will be managed to avoid displacement of threatened and endangered wildlife species and to provide for user safety, resolution of user conflict, and resource protection.
- Existing opportunities for recreational hunting will be maintained.
- Provision of adequate public access to National Forest lands is of high priority. Approximately 55 miles of roads outside the forest will be constructed in the next ten years to gain access to the Forest. Trailhead or parking facilities will be built at the end of some roads. Recreation trails will be provided to allow safe public access and to increase opportunities for natural area interpretation and winter sports. Designated ski and snowmobile trails will provide winter recreation opportunities in areas with low avalanche hazard. Improved and expanded trails to increase opportunities for physically handicapped or elderly people will be provided.
- Areas of possible overuse will be evaluated and measures (such as educating users, providing more facilities, or limiting use) will be taken to reduce the effects of overuse.

- Cooperative efforts with interested clubs, organizations, and other public agencies will be continued to provide for a wide variety of dispersed recreation activities. Cooperators will be encouraged to assist with development, operation, and maintenance of both summer and winter trail systems.
- The Forest's administrative cabin rental program will be continued.
- The private sector will be encouraged to provide facilities and services on private land where needed to serve the public.

Forest Plan Standards are referenced in the Forest Plan on page II-15. Recreation standards that are applicable to this project are as follows:

- Campgrounds and other developed recreation facilities will be constructed and managed to disperse recreation use across the Forest.
- Facilities for handicapped will be considered when recreation sites are being constructed or upgraded.
- Dispersed recreation use will be managed to provide users with a wide range of opportunities to meet increasing demand while protecting forest resources.
- The Limits of Acceptable Change will be used to guide management of dispersed recreation and wilderness areas.

Recreation Management Area Standards

The Shields Road, Shields Loop and Smith Creek Road are inclusive of 4 main Management Areas. The Forest Plan sets standards for recreation in each of these areas.

MA 7 Recreation Standards:

- All recreation opportunity spectrum classes are included in this management area.
- Developed sites will be designed to reduce impact on soil and water.

MA 8 Recreation Standards:

- The Recreation Opportunity Spectrum classes are roaded natural appearing and roaded modified.

- Dispersed recreation opportunities will be provided at a low level of investment that focuses primarily on travel planning and trail maintenance and in the event of disruption from timber harvest activities, trail relocation.
- Management activities will be oriented toward reducing the impacts associated with recreation activities on other resource values, including protection of soil and water quality.

Road and Trail Standards

Additional direction for roads and trails can be found on pages II-27 and 28 of the Forest Plan:

- Road and trail management will be determined as part of area transportation analysis and will be based on management area needs, such as recreation access, wildlife security, soil protection, economics, and protection of the investment.
- Roads and trail will be designed to standards that meet resource management objectives. Noxious weeds along roads and trails will be treated. Existing roads and trails will be maintained consistent with management area goals.

Irreversible and Irretrievable Commitments of Resources

Management of facilities (roads and trails, toilets) does not constitute an irreversible or irretrievable commitment of resources.

Issue 4: Safety - Increased traffic volume and vehicle speeds may compromise public safety.

Indicator: A smoother riding surface encourages higher vehicle speeds. Providing base course (a stable base for final surfacing) and pavement during the project for road stabilization and surface improvement from a commercial source may require truck haul on Highway 89 from the Wilsall area. The existing native surface of the Shields River Road becomes unstable and slick when wet.

Concern: The concern is that added road width and improved road surfacing will result in increased traffic and higher vehicle speeds on the Shields River road. There is an additional concern that hauling gravel from a private source off-Forest will compromise the safety of travelers on Highway 89. Finally, there is a concern for public safety stemming from use of the Shields River road in its present condition.

Affected Environment:

The affected environment includes the length of the Shields River Road proposed for improvement and use of the road in its current, unimproved condition. Demands for road access across private land and continuing increases in recreational traffic often result in damage to the road. Portions of the road become slick when wet and travel in late fall and spring commonly results in rutting.

The affected environment also includes the portion of the Shields River Road that is already paved and travel on US 89.

Direct and Indirect Effects:

Alternative A– Proposed Action with a Gravel Pit On National Forest

During Construction:

The concern for traffic volume and vehicle speeds includes a consideration of the additional traffic that will be generated during construction. Construction traffic will cause substantial traffic increases, particularly during some phases of construction. The following table shows total expected traffic volumes to haul roadbed materials. While the material is being placed on the road, up to 10 trucks might be hauling at any one time for several weeks, depending on the progression of work. Trucks are likely to be belly-dumps or end-dumps with trailers.

Table 3-3: Additional Construction-Related Traffic Volumes

Material	Volume	Truck Round Trips
Uncrushed subbase	18,000 CY (loose)	900
Crushed asphalt base	5,600 CY (loose)	280
Crushed Aggregate surfacing	16,500 CY (loose)	830
Asphalt haul from Bozeman	3,200 Tons	160
Riprap, etc	800 CY	80
Estimated Total Truck Round Trips:		2,250

Support vehicles might add ten to twenty vehicles per day over the life of the contract.

Delays are a common occurrence during construction projects. The contractor will be required to keep the road open except for occasional short delays (20 minute is common) for certain activities such as setting minor culverts. Exceptions might be authorized for major interruptions, like setting bridge stringers or major culverts. Advance notice on major delays will be provided.

Safety hazards would be controlled. Minor damage to vehicles – such as rock chips - is not unexpected around this type of construction. Irregular surfaces will be present. Low clearance vehicles will have to use added caution.

Since speeds within the construction area are slow and tightly controlled, vehicle accidents would be unexpected.

Highway 89 and Park County Road #45 are capable of supporting the additional construction traffic related to this project. Both roads are double-lane and routinely receive this type of traffic. Those jurisdictions would have to determine if the additional traffic would warrant traffic controls beyond those that presently exist.

Post Construction

Stabilizing and providing a smoother surface on the portion of the Shields River Road proposed for paving (approximately 1 ½ miles) is likely to lead to vehicle speeds similar to those occurring on the portion connecting with Highway 89. This part of the road has been paved for several years. There is moderate agricultural traffic use of this segment by slow moving machinery, hay trucks with oversize trailers and ranchers moving livestock.

Signing would be used, along with other measures as needed to alert travelers to changes in travel conditions or hazards.

A stabilized, smooth surface would address some existing safety issues stemming from the road in its current condition. Vehicles would no longer bounce around on a rough, uneven surface commonly broken by “washboards.” The tendency for drivers to swerve across the road to avoid potholes would be eliminated.

The segment of the Shields River Road that is proposed for surfacing using aggregate (crushed rock) would support use by passenger and other vehicles during wet periods without damage to the road surface. Stabilizing mud holes and providing a surface resistant to “washboarding” would prolong the period available for safe, predictable travel.

Stabilizing the road surface would reduce the tendency of drivers to weave to less damaged portions at the edge of the road. Traffic would be encouraged to stay on the travelway. There would be a decrease in the numbers of travelers requesting help from local landowners to retrieve vehicles that had become stuck in the mud.

Increasing the road width from a lane and one-half to two full lanes is expected to improve safety by separating vehicles into independent lanes. Collision-type accidents for vehicles passing each other in opposite

directions would be reduced.

The sight distance for opposing traffic will be increased at a small hill at Mile Post 1.1. Removing the hill will remove a current hazard to travelers who are unable to see oncoming traffic.

The aggregate source for this alternative would be on National Forest land, eliminating the need to haul on Highway 89 or Park County Road #45 (the currently paved portion of the Shields River Road).

The improved road is expected to result in increased vehicle speeds on the section that is proposed for paving but speeds should be no greater than on the portion that is already paved. Improving the road surface to prevent rutting and washboarding would reduce the risk of an accident since drivers would no longer have a reason to swerve to avoid damaged areas. Increasing the road width may also contribute to greater speeds than today. The likelihood of an accident would be reduced because drivers would no longer approach each other on a single lane. Improving sight distance would also mitigate greater speeds. Alternative A calls for developing a gravel source on the National Forest and use of a pit on public land would eliminate the need to haul gravel on Highway 89 or Park County Road #45.

Alternative B – Proposed Action with a Gravel Pit Not On National Forest

During Construction:

Same as alternative A except the 2250 truck trips would be utilizing Highway 89 and Park County Road #45.

US Highway 89 would handle this volume of traffic easily.

Park County Road #45 may require additional traffic controls during hauling periods. Types of traffic would not be atypical for this route, volumes may be. Park County would have to determine if additional traffic controls would be required if this alternative were selected.

Accidents would not be expected to increase.

Post Construction:

Same as Alternative A with the exception that the aggregate source for this alternative would be on private land, creating a need to haul on Highway 89 or Park County Road #45 (the currently paved portion of the Shields River Road).

Foreseeable vehicle speeds would not differ with Alternatives A and B.. Alternative B calls for developing a gravel source off the National Forest

and use of a commercial pit on private land would create a need to haul gravel on Highway 89 or Park County Road #45.

Alternative C – No Action

Vehicle speeds would not change from the present and current road conditions would persist.

Rutting during spring breakup and wet slippery surfaces would continue to pose minor safety concerns and would likely result in minor vehicle damage.

For the current traffic levels, road widths, particularly between MP 0.0 and 1.5, may continue to pose traffic passing issues with larger vehicles. Users are particularly vulnerable at the vertical curve near MP 1.1 where site distance is diminished in both directions.

The present roadbed materials are not conducive to quality grading and therefore surface irregularities will persist.

Cumulative Effects

Upgrading the road surface would prolong the period when the road can be traveled safely. It would also extend the period of use by low clearance passenger cars. Both of these effects could lead to an increase in traffic on the Shields River Road with a consequent contribution to the continuing increase in the number of visitors to the National Forest. Increased recreation use will impact the trails and road systems in the Shields River drainage. How much of this increase is directly attributable to the proposed road surface improvements is difficult to determine. Trail counters and backcountry surveys indicate that recreational use of the Shields River drainage is increasing at approximately the same rate as other areas on the Gallatin National Forest. Road maintenance and road improvement work occur annually throughout the Gallatin National Forest and it seems unlikely that many potential visitors to the Shields River basin choose to go elsewhere due to the unpredictable condition of the road surface.

Consistency with Laws, Regulations, and Policy:

Signing and other management actions taken in response to foreseeable changes in traffic patterns on the National Forest are consistent with the Forest Plan goal to “provide a *road management* program that is responsive to resource management needs (emphasis added).” (Forest Plan, Chapter II, item 11). See also the Forest Plan objective (Forest Plan Chapter II, page 6, item L) “forest roads...will be... managed... to meet management objectives.”

Irreversible and Irretrievable Commitments of Resources

Management actions taken in response to foreseeable changes in traffic patterns do not constitute an irreversible or irretrievable commitment of resources.

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Appendix A: Other Analysis Issues

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