NORTH FORK FLATHEAD ROAD

Final Corridor Study

September 2010

MONTANA MDT DEPARTMENT OF TRANSPORTATION

SEAL OF FLATHEAD COUNTY STATE OF MONTANA

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Executive Summary

The North Fork of the Flathead Road (NFFR), also locally known as the North Fork Road, is located entirely within Flathead County in northwest Montana and generally follows the North Fork of the Flathead River to the west of Glacier National Park. Although the NFFR runs from the City of Columbia Falls northward, passing near the community of Polebridge and up to the United States border with Canada, only a 13-mile section, from the junction with Blankenship Road (RP 9.5) to the junction with Camas Creek Road (RP 22.7), was covered in this study. See Figure 1.1–Project Location Map. The 13-mile study section of roadway will be referred to as the NFFR throughout this study document. This segment of roadway is a Forest Highway (Forest Highway 61) on the state Secondary Highway System (HWY 486) and maintained by Flathead County.

The request for a study along this corridor came from Flathead County in response to numerous concerns received from residents seeking a mechanism to make improvements along the gravel section of the roadway currently under the county's jurisdiction. This document discusses the findings and recommendations for the NFFR Corridor Study conducted by PB for Flathead County between March 2010 and August 2010. The purpose of the study was to gather information from the public to identify options and consensus, if any, to improve driving conditions and the surrounding environment. The corridor study evaluated the feasibility of improving the corridor, including assessing a range of low-level safety or maintenance-type improvements to consideration of major reconstruction. The intent of the study is not to identify a specific project, but to give Flathead County options to consider in future planning on the NFFR, if public consensus exists.

The section of NFFR being studied is functionally classified as a rural major collector. The corridor study area is 300 feet wide and centered on the roadway. The corridor study process evaluated existing and future conditions of the corridor study area and made recommendations for possible improvement options for the NFFR within the study limits. Activities included:

- Researching existing conditions;
- Documenting existing and projected geotechnical, land use, and environmental conditions;
- Identifying stakeholder concern and issues for the corridor study area
- Forecasting future growth;
- Identifying goals and analyzing possible improvement options for the corridor from several perspectives including financial feasibility, and public acceptance; and
- Identifying possible improvements and management strategies for the existing and long-term safety and operation of the corridor.

The process involved a collaborative effort with Flathead County, other agencies and the public in identifying transportation problems, the most efficient and effective possible options to address the issues and concerns, and public consensus, if any.

ES1 Study Objectives and Corridor Needs

Objectives for the study were identified at the beginning of the study process and were further refined based on input from the public and resource agencies. They included:

- Document existing conditions –roadway and environmental
- Review data available that projects future growth

- Identify corridor issues
- Develop corridor goals and possible improvement options
- Analyze future transportation improvements based on impacts, constructability, public acceptance, and financial feasibility
- Recommend possible improvement options and management strategies for long-term safety and operation of the corridor
- Maintain character of the area
- Develop dust mitigation strategies
- Review impacts on wildlife
- Identify maintenance needs - roadway surface conditions, including washboard and potholes
- Review travel speeds
- Document roadway safety
- Review emergency services

ES2 Strategies for Identifying Corridor Problems

The following strategies were utilized to identify problems within the study corridor:

Review of Existing MDT Reports

Existing reports that MDT has prepared for the corridor were reviewed. They include the following:

- Preliminary Geotechnical Report, April 2010
- MDT Accident Analysis Reports

  The analysis showed that accident trends within the corridor study area are higher than the statewide average for similar type routes. Also the overall accident category is loss of control on curves, usually during snowy, slushy or icy roadway conditions, and possibly driving too fast for conditions. More than half of the accidents that occurred within the corridor study area occurred at night and were single car crashes.

- Environmental Scan

  This document was completed as part of this study to identify the biological resources and environmental considerations near the corridor study area. A summary of the results of the scan have been included in this Corridor Study, the full Environmental Scan document is available electronically on the study website and as part of the Final Corridor Study paper documents on a CD. Numerous species of wildlife and vegetation are described that occur or have habitat within the roadway corridor, as well as the aquatic resources and wetlands.

The Geotechnical Report and Environmental Scan are available on a CD ROM. The CD is included as part of the report for public and agency review.

Stakeholder interviews

The fourteen stakeholders shown in Table ES-1 were interviewed. During the stakeholder interviews, safety and environmental concerns were discussed with landowners, resource

agency staff, business owners, recreation outfitters, non-profit organizations and a local government official.

Table ES.1 – Stakeholders/Organizations

Role/Title	Association
President and Vice President	North Fork Land Owners Association
Key Staff	Fire Department and Emergency Services
Representative	National Parks Conservation Association
Individual	Property Owner
Senior Command	U.S. Border Patrol
Trail Manager	Recreational Trails, Montana Fish Wildlife Parks
Leader Member	National Resource Defense Council
Tour Manager	Adventure Cycling
Leader Member	North Fork Preservation Association
Leader Member	North Fork Compact
Member	North Fork Coalition for Health and Safety
Key Staff	Columbia Falls Chamber of Commerce
Owners	Guides and Rafting Outfitters
City Official	City of Columbia Falls

Engineering Review

The existing roadway alignment was compared to current MDT and Flathead County design standards to identify areas that do not meet current standards. Overall, the roadway complies with most MDT and County design standards. There are no major improvement concerns that would result in shifting the alignment.

Public and Agency Coordination

Coordination with the general public and the resource agencies occurred throughout the study. Feedback from the public and agencies was used to identify corridor issues and concerns, as well as potential improvement options. Several meetings occurred during the study process.

ES3 Improvement Options

Over 25 improvement options were analyzed to address the issues and concerns identified in the corridor study area (Table ES.2). A detailed description of each option is included in Section 4. Options were grouped into five categories – maintenance, stabilization treatments, improved grading/surfacing, speed enforcement strategies, and bituminous surface treatment. A no-action option was also included.

The “no-action” category was intended to illustrate the option that would maintain the road in its current state, at the current level of operations. The cost comparison for the no-action option included grading twice per year and dust control, since those were the maintenance options which were proposed to change. Improvement options 2 through 5 would be actions taken beyond those contained in the “no-action” or existing conditions routine maintenance. Costs associated with any of the improvement options (2-5) are in addition to the cost of the “no-action” or existing conditions.

Table ES.2 – Potential Improvement Options

Improvement Options	
1	No-action
2	Maintenance
2a	Additional grading of current road
2b	Guardrail Installation
3	Stabilization Treatments
3a	Bentonite
3b	Magnesium chloride/ calcium chloride
3c	Lignin
3d	Black oil
3e	EnviroKleen
3f	RoadOyl
3g	SoilSement
3h	Dead wood and vegetable oil
3i	Soybean oil byproduct
4	Improve Gravel Surfacing
4a	New gravel lift
4b	Double shot/bitumen
4c	Driving Surface Aggregate (DSA)
5	Speed Enforcement/reduction Strategies
5a	Speed indicator signs (solar)
5b	Speed dips
5c	Narrow the gravel roadway
5d	Police car with dummy
5e	Additional signage (safety or speed limit)
5f	Fund additional law enforcement
5g	Educational effort to reduce speeds
6	Bituminous Surface Treatment/Asphalt Concrete Pavement
6a	Full pavement - complete 36' width
6b	Full pavement - 24' top, 11' travel ways
6c	Millings/asphalt (with chip seal)
6d	Foamed asphalt mix (with double shot)

ES4 Corridor Improvement Options Advanced

All options were reviewed for potential cost. Eight criteria per option were analyzed. Each option was then reviewed for advancement into additional study or elimination from further consideration (Table ES.2). Criteria for screening included:

- Helps with dust abatement
- Agrees with land use and management plans
- Impacts to environment
- Impacts to wildlife
- Potential to increase vehicle speed
- Improvements to road safety
- Potential to increase traffic
- Estimated cost over 20 years

While several of the improvement options presented in the study are feasible from an engineering perspective, only additional grading and stabilization treatments have public support (Table ES.3). Regardless, implementation is dependent upon funding being secured.

Table ES.3 – Viable Improvement Options

Improvement Options		Viable Feasible / Public support
2	**Maintenance**	
2a	Additional grading of current road	Yes / Yes
3	**Stabilization Treatments**	
3a	Bentonite	Yes / Potential
3b	Magnesium chloride/ calcium chloride	Yes / Potential
3c	Lignin	Yes / Potential
3f	RoadOyl	Yes / Potential
3g	SoilSement	Yes / Potential

*Implementation is dependent upon funding being secured.

ES5 Next Steps

Future actions taken for this segment of the NFFR will be determined by Flathead County. This study provides a diverse list of improvement options that may be considered. If any option demonstrates public buy-in, is selected and funding is prioritized by the county for that option, a project implementation process would begin, including any required environmental process.

1.0 Introduction

1.1 Study Purpose

This document discusses the findings and recommendations for the North Fork Flathead Road (NFFR) Corridor Study conducted for Flathead County by PB Americas, Inc. with technical support from the U.S. Forest Service (USFS), Glacier National Park and the Montana Department of Transportation (MDT). This study was undertaken at the request of Flathead County, in response to the numerous concerns received from residents seeking a mechanism to make improvements along the gravel section of the roadway currently under the county's jurisdiction. The study was conducted based on the "Montana Business Process to Link Planning Studies and NEPA/MEPA Reviews" process. (Cambridge Systematics, 2009)

The purpose of this study was to gather information from the public to identify options and consensus, if any, to improve driving conditions and the surrounding environment. The corridor study evaluated the needs of the users of the roadway, those responsible for maintenance of the roadway, and the major landowners and land management agencies along the roadway including the USFS and National Park Service. The process also provided a means for facilitating resolution of major issues before any specific project programming and development begins. This study was not intended to meet NEPA/MEPA requirements but to determine where concerns exist. Information from this study may be used in the NEPA/MEPA analysis if improvement options from this study are forwarded into project development. The intent of the study is not to identify a specific project, but to give Flathead County options to consider in future planning on the NFFR, if public consensus exists. The process began in March 2010. Activities included in this process were:

- researching existing conditions;
- documenting existing and projected geotechnical, land use and environmental conditions;
- assessing future growth and land use plans; and
- analyzing improvement options for the corridor.

The analysis was performed with consideration given to public acceptance and recommendations, constructability, financial constraints, and environmental impacts.

1.2 Study Background and Location of Corridor Study Area

The NFFR is located in northwest Montana, entirely within Flathead County, and runs from the City of Columbia Falls northward passing near the community of Polebridge and up to the United States border with Canada. The 13-mile section of the NFFR (junction with Blankenship Road (RP 9.5) to the junction with Camas Creek Road (RP 22.7)) covered in this study is a Forest Highway (Forest Highway 61) on the state Secondary System (HWY 486), and maintained by Flathead County. Figure 1.1 shows this location.

HWY 486 is functionally classified as a rural major collector. This corridor is located in the eastern edge of the Flathead National Forest, and to the west of Glacier National Park and generally follows the North Fork of the Flathead River. The corridor study area is 300 feet wide and centered on HWY 486.

The existing geometrics of the NFFR within the corridor study area are challenging in that the roadway traverses mountainous terrain that abuts the North Fork of the Flathead River at numerous points. Surface widths vary from 28 to 44 feet, creating difficulties with maintenance activities. In addition, dust conditions produce poor visibility and safety concerns, especially

during the summer months. These conditions and challenges resulted in the decision for Flathead County and MDT to proceed with this corridor study process.

1.3 Corridor Issues and Needs

The issues and needs shown below were initially identified through public comments received at the beginning of the study process.

- Coordination of emergency services is needed to address long travel times from Columbia Falls up the NFFR for ambulances and fire fighting equipment vehicles.
- Seasonally a large amount of dust is present at speeds approximately 20 miles per hour (mph) and greater. The dust causes visibility issues which can lead to safety concerns for vehicles, and for pedestrians or cyclists on the side of the roadway.
- Maintenance of the roadway by Flathead County is challenging due to varying roadway widths, with some areas as wide as 44 feet. This width can require up to eight passes with the grader, which increases maintenance costs over the standard roadway width of 32 feet. The washboard conditions are of concern to regular travelers of the roadway; the tendency described is that vehicles slide off the road in the washboard condition areas. This washboard condition also has been cited as causing the need for vehicle maintenance.

Following public, stakeholder and agency input, these needs were re-evaluated and further refined. Additional needs for the corridor identified during the study process were:

- Improve safety conditions and decrease accidents
  - Improve geometric elements
  - Address inconsistent roadway widths
  - Improve maintenance, including washboard, pothole conditions and dust issues
  - Balance the needs of all users (residents, emergency responders, tourists, recreational)
- Minimize impacts to wildlife, including the threatened and endangered species
  - Maintain existing wildlife linkage zones
  - Preservation of the existing character of the area.

This study identified corridor issues and concerns along with potential solutions. With input from the public and resource agencies, the study team developed several possible improvement options to address the issues and concerns which currently exist in the NFFR corridor study area.

Figure 1.1 - Study Area Location Map

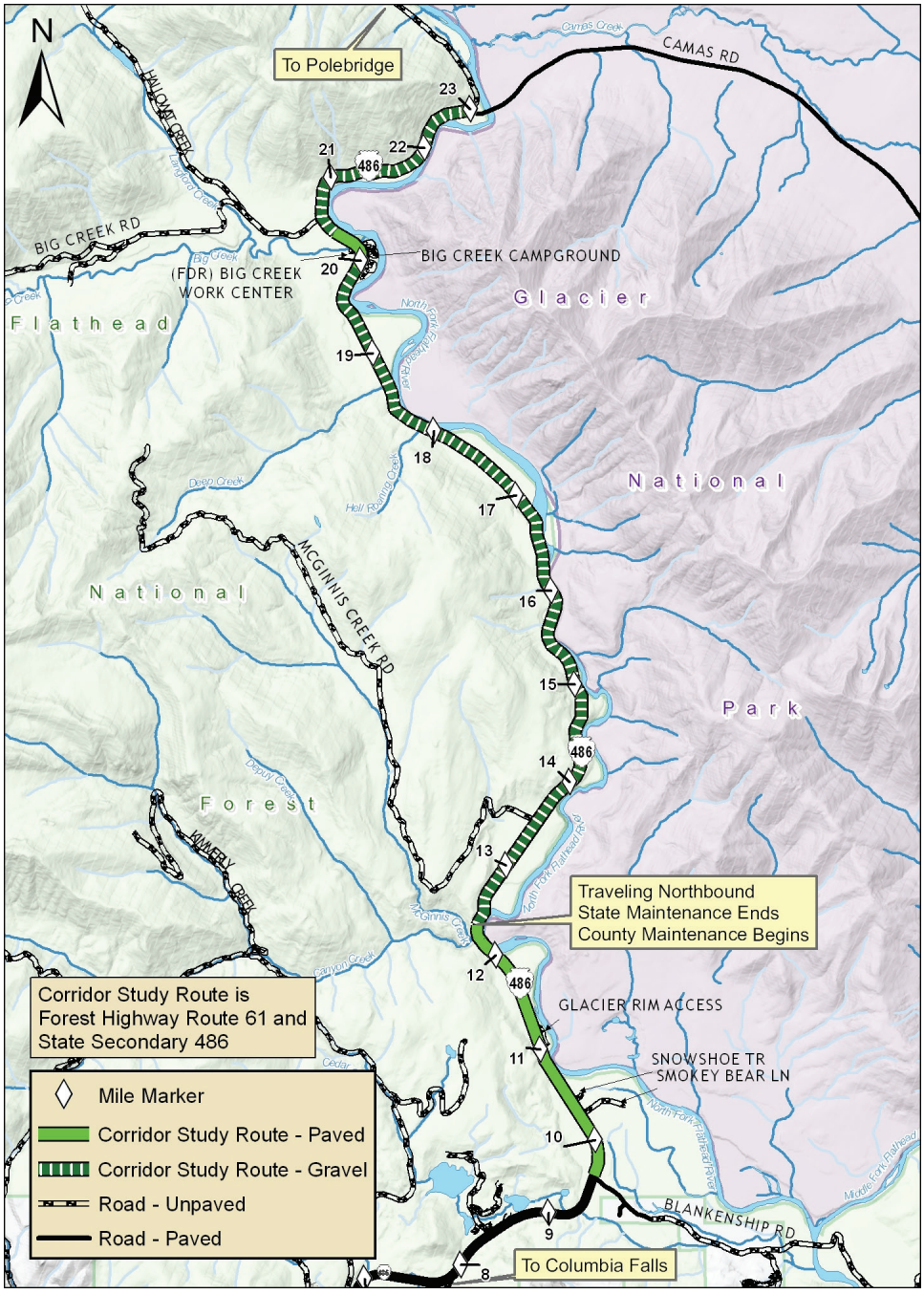


Figure 1.2 - Study Area Jurisdiction Map

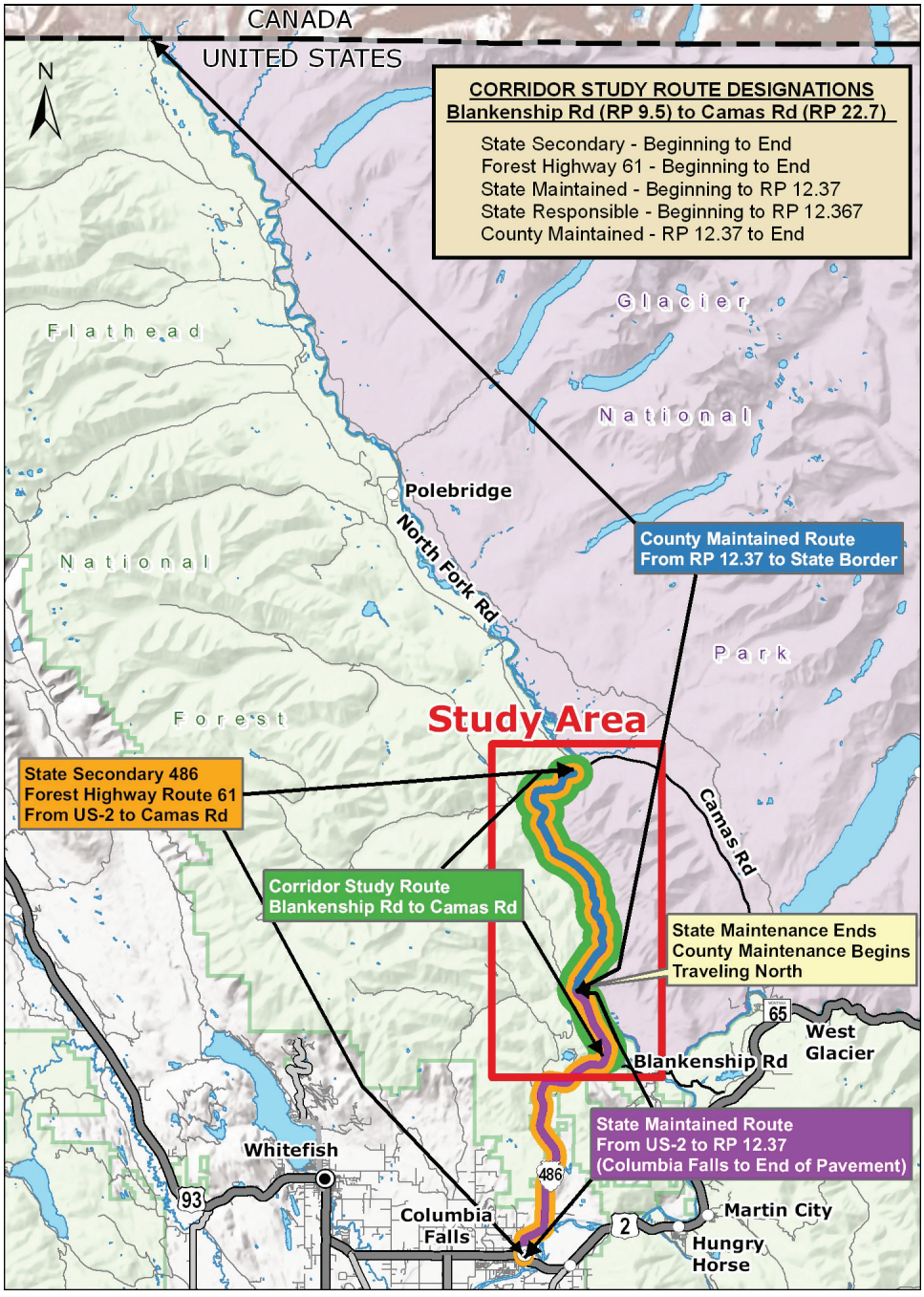
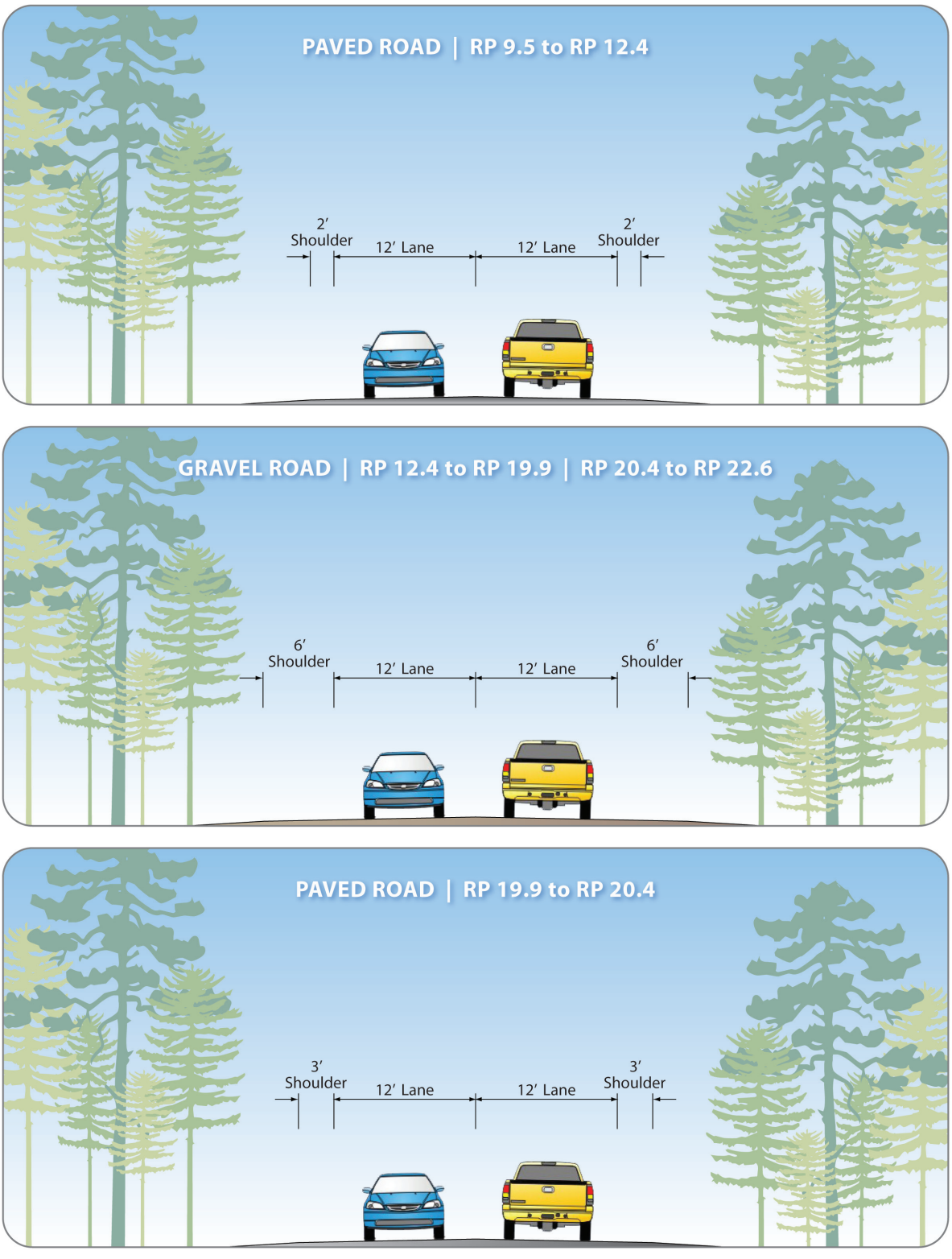


Figure 1.3 - Existing Typical Cross Sections



2.0 Existing Conditions

This section documents the existing roadway conditions and environmental factors within the NFFR corridor study area. Although the corridor boundary is 300 feet wide and centered on HWY 486, the environmental footprint extends well beyond the corridor boundary and takes into consideration the total extent shown in the accompanying study area maps.

2.1 Roadway and Physical Characteristics

Existing Roadway Users and Traffic Volumes

Primary users are local land owners along the south end of the corridor, residential traffic to and from Polebridge, logging trucks, and recreational users accessing USFS owned lands and the Glacier National Park. The road is used for recreation during the non-winter months, and during the winter months, traffic is primarily residential. The limited winter recreation that occurs in the area includes snowmobiling, cross country skiing, snow-shoeing, dog sledding and wildlife viewing. Winter recreation does not increase traffic on the NFFR as much as the recreational users in the summer season.

The weighted Average Annual Daily Traffic (AADT) for the corridor study area in 2009 is 280. This traffic volume does not exceed the current capacity of the roadway, which is approximately 4,000 vehicles per day for a typical gravel secondary roadway. The corridor does not currently experience delays or congestion during peak travel periods. In 2009, the commercial vehicles portion of the AADT was only 17 vehicles.

Seasonality of traffic patterns was estimated using the seasonal adjustment factors for US-2, which has the nearest permanent counter to the NFFR. Ideally, the best correlation would be from nearby roads with the same classification and traffic characteristics; however, US-2 is the best information currently available for seasonal variations. Table 2.1 shows the estimated seasonal variation in daily traffic for the NFFR. The months of June through September are all higher than the average AADT.

Table 2.1 – Estimated Seasonal Variation in AADT for the NFFR

Month	Weighted AADT 2009	Percent Average Day of Yearly Average [1]	Monthly Weighted Average
January	280	57	159
February	280	64	178
March	280	63	176
April	280	73	203
May	280	100	281
June	280	137	385
July	280	194	542
August	280	167	468
September	280	136	381
October	280	83	232
November	280	69	192
December	280	58	163

[1] Obtained from "Yearly ATR Profile 2009" for MDT's permanent traffic recorder A-60. A-60 is, located on US 2 RP 19.6, approximately 1.5 miles north of Columbia Falls.

Right-of-Way (ROW) and Jurisdiction

The existing road is predominantly located on USFS property. A few sections of the roadway in the southern end of the corridor study area are also located on ROW easements obtained from private property. Beginning at approximately RP 13.5, the NFFR is solely located within a USFS easement, which varies from 100 to 160 feet wide. The easement extends beyond the cut or fill slope sections of the roadway as necessary. The paved section near Big Creek (approximately RP 19.9-20.4) has an easement width of 160 feet. Property ownership information is in the ROW plats for Flathead County.

The highway was originally constructed as a local settler and miner road. After World War II, it became predominantly a timber harvesting road until about 1961. The road was improved by the Forest Service in 1952-1954.

the NFFR from Columbia Falls to RP 12.3 (end of pavement) is maintained by state forces. From the end of pavement to Camas Road (study terminus), it is maintained by Flathead County. From Camas Road to the Canadian Border, it is a local county road and also maintained by Flathead County.

Physical Characteristics

the NFFR is functionally classified as a major collector and is part of the Montana Secondary System. A portion of the road (RP 9.5 to RP 12.4 and from RP 19.9 to 20.4) within the corridor study area is paved as two lanes. The remainder of the road has a gravel surface.

the NFFR follows the course of the North Fork of the Flathead River on the western bank. Canyon Creek, Hell Roaring Creek, Deep Creek, and Big Creek cross under the road to reach the North Fork of the Flathead River. A bridge is constructed over Big Creek, while the other streams cross under the road through culverts.

The average roadway width is 32.6 feet narrowing to as little as 24 feet, and constructed and as wide as 36 feet in other areas. Over time the gravel portion has gradually widened out beyond the 36 feet constructed width in some portions of the roadway. The terrain is heavily forested, and mountainous. There are some large cuts into rocky slopes or rock faces on the west where the road alignment comes close to the North Fork of the Flathead River, with guardrail-protected steep fill slopes on the east. These are mainly around RP 12-12.5, RP 14.5, RP 15-RP 17, RP 18-RP 18.6, RP 19.5, RP 20.3-RP 21, and RP 22-RP 22.5.

Over time, both the USFS and Flathead County have improved portions of the NFFR with bituminous surface treatments and asphalt pavement. In 1984, the majority of the gravel roadway was redesigned to meet a 40 to 50 mph design speed. The recorded width of the gravel section of road is 32.6 feet across, including graded shoulders, although over time the gravel portion has gradually widened out beyond a 36 foot width.

The posted speed limit along this section is 35 mph; 20 mph is advised when roadway dust is present. The gravel portions of the road can be dusty, and wash-boarding is a condition along many sections of the NFFR within the corridor study area. Pothole severity varies throughout the year, with very little potholing soon after the road is graded, to numerous potholes when the road has not been graded for a while. This is one issue raised by roadway users. Flathead County maintains the gravel section of road, typically grading twice a year plowing snow in the winter months, fixing guardrail, rockslides, and other maintenance that may be necessary. In 2007, the maintenance cost was $209,910. See Appendix C for more data.

In 1987, the paved portions of the road from RP 9.7 to RP 12.4, and RP 19.9 to 20.4 were reconditioned with a new asphalt layer. The widths of the road are 28 feet (12 foot travel ways and 2 foot shoulders) for the southern paved section, and 24 feet (10 to 11 foot travel ways and

1 to 2 foot shoulders) for the paved section at Big Creek Bridge. The posted speed limit for the southern paved section is 70 mph.

2.2 Design Standards

Table 2.3 lists the current design criteria for a rural collector road. For paved roadways, MDT's criteria apply, and for unpaved roadways, Flathead County's criteria apply. These criteria were used for a further, more detailed analysis of whether the road meets current design standards, and for analysis of any improvement options.

Roadway Geometrics

The existing physical and geometric characteristics of the NFFR were evaluated for the corridor study area to identify areas that do not meet MDT and Flathead County geometric, sight distance, and roadside/clear zone design standards. This analysis was necessary to identify areas with any safety concerns and substandard criteria which potentially lead to decreased driver safety and accidents.

To identify the roadway functional characteristics, available information was analyzed at a high-level or "10,000 foot level." This information included as-built construction drawings, MDT's photolog video of the corridor, right-of-way construction drawings, and MDT's Road Log. The findings of the analysis are summarized in Table 2.2 and then discussed in more detail below.

Table 2.2 – Summary of Geometric Analysis

Geometric Characteristic	Summary
Horizontal Alignment	Rock cuts that limit sight distance
	Redesigned to meet 40 to 50 mph design speed
Clear Zones	Exceptions allowed for rock faces in clear zone
	Vegetation may be encroaching
	Guardrail in place at visible steep slopes
	Waterfall on at least one slope part of the year
Vertical Alignment	Sight distance acceptable
Lane Width	Width meets minimum requirements

Horizontal Alignment

Based on the photo log and field visits on the roadway, many of the horizontal curves have rock cuts on the west side of the road, which limit sight distance. In an MDT memo dated May 28, 1980 with preliminary design information for the project completed in 1984 (FHP 61-1(5)), the roadway was discussed, including the complete redesign of the gravel portion of the roadway to meet a 40 to 50 mph design speed.

Table 2.3 – Roadway Design Criteria

DESIGN CRITERIA				
Design Element			Design Criteria - MDT [2]	Design Criteria - Flathead County [3]
Design Controls	Functional Classification		Rural Collector Road	Mountainous Collector Road
	Design Forecast Year		2030	2030
	Design Speed	Mountainous	45 mph	45 mph (pg. 420) [1]
	Level of Service		B	B
Roadway Elements	Design Year Traffic	Current AADT	280	280
		Projected AADT	340	340
		Projected DHV [4]	51	51
	Roadway Width	Travel Lane and Shoulder	24 ft	24 ft (pg. 425) [1]
		Bicycle Shoulder	4 ft [6]	4 ft [7][6], pg. 314 [1]
	Clear Zone[5]	Cut Slope	8-10 ft, none for rock slopes	8-10 ft [1]
		Fill Slope	10 ft (6:1V) 14 ft (4:1V)	10-12 ft (6:1V) [1] 12-14 ft (4:1V)
	Cross Slope	Travel Lane	2%	1.5% - 2% (pg. 421) [1]
		Shoulder	2%	1.5% - 2% (pg. 421) [1]
	Median Width		N/A	N/A
Earth Cut Section	Inslope		4:1 (6 ft)	4:1 (3:1 in cut) pg. 425 [1]
	Ditch	Width	10 ft (Figure 12-5) or 0 ft (Figure 11.7M)	N/A
		Slope	20:1	N/A
	Back Slope; Cut Depth at Slope Stake	0'-5'	5:1	N/A
		5' - 10'	3:1	N/A
		10' - 15'	2:1	N/A
		15' - 20'	1.5:1	N/A
		> 20'	1.5:1	N/A
Earth Fill Slopes	Fill Height at Slope Stake	0'-10'	4:1	N/A
		10' - 20'	3:1	N/A
		20' - 30'	3:1	N/A
		> 30'	2:1	N/A
Alignment Elements	DESIGN SPEED		45 mph	45 mph (pg. 420) [1]
	Stopping Sight Distance		360 ft	for uncontrolled intersections: 220 ft all others, 360 ft (pg. 112) [1]
	Passing Sight Distance		1625 ft	1625 ft (pg. 124) [1]
	Minimum Radius (e=8.0%)		590 ft	150 ft at centerline / 587 ft (pg. 169-170) [1]
	Superelevation Rate		emax = 8.0%	emax = 8.0% (pg. 424)
	Vertical Curvature (K-value)	Crest	61	61 (pg. 422) [1]
		Sag	79	79 (pg. 422) [1]
	Maximum Grade	Mountainous	10%	10% (pg. 423) (1)
	Minimum Vertical Clearance		16.5 ft	14 ft (pg. 427) [1]

(1) AASHTO Green Book - Refers to AASHTO's "A Policy on Geometric Design of Highway and Streets" 2004

(2) All Information listed here was taken from Figure 12-5 "Geometric Design Criteria for Rural Collector Roads" Montana Department of Transportation Road Design Manual Chapter 12 except where otherwise noted.

(3) Flathead County's "Minimum Standards for Design and Construction" 17 Nov 2009

(4) For planning-level analysis, used an average value of 15% of the AADT for Montana secondary roads, per MDT Road Design Department.

(5) AASHTO's "Roadside Design Guide" Table 3.1, and MDT's "Road Design Manual" Figure 14.2A

(6) AASHTO "Guide for the Development of Bicycle Facilities," 3rd Ed, 1999

(7) MDT Road Design Manual, Ch 18.2.4 states to use the "AASHTO Guide for Development of Bicycle Facilities" criteria (see note 6).

Clear and Roadside zones (cut, fill, trees, guardrail)

Guardrail appears to be in place at all locations with steep fill slopes, mainly where the road comes close to the North Fork of the Flathead River. Rock slopes are present in a number of locations, however, MDT standards allow for an exception to allow the clear zone requirement for rock slopes to end at the toe of the slope. There is one rock face in particular, Hell Roaring Creek, which had an impromptu waterfall running down it during the study team's site visit, as shown in Figure 2.1. From viewing the photolog, there also appear to be quite a number of trees which may encroach into the clear zone, due to the heavily forested nature of the corridor.

Vertical Alignment

Based on review of the photolog, and as observed in field visits conducted August 27, 2009 and April 21, 2010, there did not appear to be any vertical curves where sight distance was an issue.

Lane Width

The MDT Road Log shows that the road from RP 9.5 to RP 12.4 is 28 feet wide (12 foot lanes with 2 foot shoulders), consistent with the very beginning of the photolog. The gravel road from RP 12.4 to RP 19.9 and RP 20.4 to RP 22.5 is reported as 36 feet wide, which is also reflected in the typical section of the as-built drawings for the most recent construction, FHP 61-1(5). The as-built drawings used for analysis were paper copies used to record the construction of the gravel roadway in 1984.

This width and the as-built drawings suggest that there is 12 feet provided for travel ways, with two feet of shoulders at the same two percent cross-slope as the road, and two feet of shoulder on the graded fill slopes. The second section of paved road from RP 19.9 to RP 20.4 is reported to be 24 feet wide (12 foot lanes with no shoulders). The corridor appears to meet minimum width requirements of MDT, Flathead County, and the American Association of State Highway and Transportation Officials (AASHTO).

Design Standard Conclusion

Overall the roadway complies with most MDT and County design standards. There are no major improvement concerns that would result in shifting the alignment.

2.3 Geotechnical

A field visit was conducted by MDT and a limited drilling program was conducted for the gravel section of the roadway on April 21, 2010. Seven shallow borings were completed to evaluate the gravel surfacing and sub grade. The limited numbers of borings are justified given the geologic mapping of the area that indicates very consistent subsurface conditions. Based on those borings, it was recommended that only a minimal paving section would be required if desired. There is an 8 to 10 foot depth of fill in the existing roadbed, which would likely translate to minimal addition material if a pavement option were selected for this roadway section.

Also noted during this visit were several cut slopes along the alignment, most of which exhibit some degree of slope movement, mainly consisting of surface raveling but also some deeper movement. The existing road could likely be paved without cutting into existing slopes, but new cuts should be approached with caution because of destabilization of cut slopes. Also, two R-value tests were completed. Based on review of these preliminary findings, it was determined that a more in-depth geotechnical investigation would be required for evaluation of cuts and fills if a full reconstruction and pavement project were pursued.

Figure 2.1 - Rock Face, Two Views on West Side of Highway 486

2.4 Drainage

The corridor study area is located within the North Fork of the Flathead River drainage. The drainage has a number of creeks and tributaries. Big Creek is the largest stream in the drainage, with Deep Creek, Hell Roaring Creek, and Canyon Creek as tributaries to North Fork of the Flathead River. Runoff from the NFFR currently goes into the adjacent streams. No storm water runoff piping or treatment is currently in place for the NFFR.

2.5 Hydraulic Structures

the NFFR follows the course of the North Fork of the Flathead River on the western bank. Canyon Creek, Hell Roaring Creek, Deep Creek, and Big Creek cross under the road to reach the North Fork of the Flathead River. A bridge is constructed over Big Creek, while the other creeks cross under the road through culverts. Based on the Environmental Scan, the Deep Creek culvert routinely becomes clogged with sediment because it is undersized. The current culvert is a barrier for fish passage.

As shown in Figure 2.1, there is a waterfall down a rock face near Hell Roaring Creek during part of the year. A hydrologic analysis of the streams was not performed. A full stream hydrologic analysis would be recommended if a roadway improvement project is considered.

2.6 Crash Analysis

MDT crash data was analyzed. The crash data indicated that the statewide rural crash rate for years 2004 to 2008 for secondary roads is 1.53. The rural crash rate from 2004 to 2009 for the corridor study area is 3.59. Although this rate is high, the actual number of total crashes is low. On average, there were three crashes a year, with five crashes in 2003 and six crashes in 2008. There were a total of 37 crashes over a ten-year period from 1999-2009. During this period, there was one fatality in 2009. This data reflects only formally reported accidents, and not minor accidents where the vehicle(s) involved suffered minor to no damage and were not reported.

There did not seem to be a distinct overall trend for the type of crash. Most of these crashes were single vehicle crashes which resulted in a collision with a roadside object, guardrail, or overturn, but rarely with another vehicle. The majority of crashes occurred in the daytime. There were few crash clusters – at RP 11.3 to11.4 (5 crashes), RP 14.0 to14.2 (3 crashes), and RP 16.6 to16.7 (3 crashes), which indicates that these locations may have roadway concerns or conditions, which could have contributed to the crashes. However, the small data set is not conclusive and other factors should be taken into consideration. RP 11.3 is on the southern paved portion of the road, along a straight section. The Glacier Rim Access is in this general vicinity; however none of the accidents were at the junction. One was due to alcohol, one was due to “too fast for conditions” on a clear dry day and three were due to snowy/icy conditions; two of which were going too fast for these conditions.

Other factors which may have an effect could be speed of the vehicles or clear zones. From a preliminary review of the corridor photolog, the side of the road does not appear to consistently meet clear zone requirements. In locations there are steep fills to one side of the road, which may not allow for much vehicle recovery; in others, there are trees which may be encroaching on the clear zone.

Fifty three percent of the comments in the crash log were “Too Fast for Conditions.” The reason for auto crashes is not defined in detail, so an exact cause cannot be determined. These causes are typically a result of drivers not slowing for roadway conditions that may include dust, potholes, washboard, ice, rain, or snow.

The southern paved portion of the corridor study area is signed at 70 mph, which may contribute to the crash rate. This crash rate could be a result of the change in roadway surface from paved to gravel. Drivers may be reluctant to slow down or uncomfortable slowing down from 70 to 35 mph in a short distance as the paved roadway transitions to gravel. Whatever the reason, the speed limit has remained low, signed at 35 mph, or 20 mph advised when dust is present.

The conclusion made by the study team is that the design speed of the roadway is higher than the posted speed limit, and, without a lot of traffic congestion and except in severe dust conditions, the majority of drivers tend to exceed the posted speed limit. This is likely considering a majority of the road was redesigned in 1984 to meet a 40 to 50 mph design speed.

Although dusty roadway conditions decrease visibility considerably, as illustrated in Figure 2.2., dust was never cited as a contributing factor in the accident logs.

There were four reported wildlife-related collisions in the last ten years along this section of roadway. This reflects only formally reported collisions by the Montana Highway Patrol. MDT's Maintenance division has picked up 14 carcasses of deer/elk on HWY 486 over the noted time period, but these were all south of the corridor study area.

2.7 Demographics

According to the U.S. Census in 1990 Flathead County had a population of 59,218 residents (U.S. Census, 1990). The Montana Census and Economic Center states that in 2009, the population of Flathead County had grown to an estimated 89,624 residents (MT Census, 2009). NPA Data Services, Inc. projects the 2030 the population of Flathead County will grow to 127,250 residents (NPA, 2030). In 1990, Flathead County had a total of 22,834 households. By 2009 approximately 38,406 households were located in Flathead County. Flathead County had 28,495 jobs in 1990 and in 2009 the number of jobs had risen to 39,773. The average income per household in 1990 was $24,145 and in 2007 this figure rose to $45,122.

2.8 Development

According to the Flathead County North Fork Neighborhood Plan, there are three land use types in the North Fork neighborhood: residential, agricultural, and commercial. Although three land use types are identified in the North Fork Neighborhood plan, these uses are minimal along the study corridor, most of the land is owned by the USFS.

A majority of the residential land owners in the area use their properties for recreational purposes, frequenting the area primarily in the summer months. Less than 20 percent of the landowners live in this area year round.

The largest concentration of small tracts of privately held land is north of the corridor study area. The bottom of the North Fork valley holds a large portion of lands that have been subdivided over the past several years. There are no active subdivisions in the platting processes or recent approvals of subdivisions (Hagemeier, 2010). The remote, undeveloped nature of the North Fork area limits the opportunities for future growth, no utilities, long distances from law enforcement, health care and schools.

Figure 2.2 - Dust Rising Behind a Traveling Vehicle on the North Fork Flathead Road

While the zoning district in the area (1 unit per 20 acres) north of Camas Road will limit the potential build-out of the North Fork valley, it has fewer restrictions on the use of the property. It is anticipated that uses such as rental cabins, bed and breakfasts, and residential businesses will become more common in the North Fork in the future. The North Fork also may experience pressure for the development of resorts and other commercial attractions that are incompatible with its remote, undeveloped character, as described in the North Fork Neighborhood Plan. The majority of the land between Blankenship Road and Camas Road is public; however, there is a small amount of private land. Restrictions on the spacing of septic and water facility locations has limited development.

2.9 Management Emphasis on Adjacent Public Lands

The USFS is responsible for the public lands and administration of the lands in the corridor study area. Recreational facilities and forest management are subject to USFS regulations. The Forest Management Plan determines allowable uses on USFS land and guides the USFS's future decisions with respect to allowable uses, habitat conservation, recreation, and economic use of the forest resources.

Due to legal challenges to the 2005 and 2008 Planning Rules, development of the Forest Plan revision effort for the Flathead National Forest has been temporarily suspended. Future work on revision of the Forest Plan will be contingent on the results of the development of the new Planning Rule, outcome of litigation, availability of funding and staff. The USFS has some general management direction for the North Fork Flathead sub-basin and the two geographic areas directly adjacent to the corridor study area. The Flathead Forest Plan (December 1985) and Record of Decision (January 1986) identify various management areas within and adjacent to the corridor study area.

Most of the NFFR corridor study area is within a Wild and Scenic River Management Area as the section of the river adjacent to the roadway is classified as a recreational river segment. Within the corridor study area, other management areas abutting the western boundary of the wild and scenic river corridor place emphasis on timber management. They also provide suitable winter range habitat for white-tailed deer, mule deer, and elk winter.

The USFS implements national policy and direction for multiple-use management of public lands and strives to strike a balance among resources to achieve the goals set forth in the Flathead Forest Plan. Within and adjacent to the corridor study area, the Flathead Forest Plan direction emphasizes maintaining wild and scenic river characteristics, sustaining winter range habitat conditions, and providing sufficient habitat to promote the recovery of threatened Grizzly bear and bull trout species.

Many individuals support improving the road within the corridor while others prefer to maintain the existing gravel roadway. The USFS is neutral on this issue. Glacier National Park (GNP) is opposed to paving the road since its management direction is to preserve and protect the primitive values inherent in the North Fork portion of the Park. GNP believes that paving would lead to an increase in traffic and development, loss of wildlife habitat and connectivity, and a degradation of the primitive values of the North Fork portion of the Park. The Park's designation as a World Heritage Site and Biosphere Reserve also intensifies the Park's desire to preserve this area.

Reviews were also conducted to determine the presence of Section 4(f) and Section 6(f) properties along the corridor. Section 4(f) refers to the original section within the Department of Transportation Act of 1966 (49 U.S.C. 303), which set the requirement for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development. Prior to approving a project that "uses" a Section 4(f) resource, FHWA must find that there is no prudent or feasible alternative that completely avoids 4(f) resources and that the

action includes all possible planning to minimize harm to the property resulting from "use." "Use" can occur when land is permanently incorporated into a transportation facility or when there is a temporary occupancy of the land that is adverse to a 4(f) resource. Constructive "use" can also occur when a project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under 4(f) are "substantially impacted".

If a project is forwarded from this corridor study and depending on the funding of the project a Section 4(f) Evaluation would be completed. Also depending on if a project is forwarded from this study and the nature of the project, coordination with the Flathead National Forest would need to be conducted regarding the Big Creek Campground near Milepost 20.5 as a Section 4(f) resource. Glacier National Park is a Section 4(f) resource property. The North Fork of the Flathead River is designated as Wild and Scenic and as such, Section 4(f) may also apply. These two resources may need to be reviewed for constructive use if a project is forwarded using United States Department of Transportation (USDOT) funding.

Section 6(f) of the Land and Water Conservation Funds Act applies to all projects that impact recreational lands purchased or improved with Land and Water Conservation funding. The Secretary of the Interior must approve any conversion of property acquired or developed with assistance under this act to other than public, outdoor recreation use. At this time, there are no Section 6(f) resources identified in the study corridor.

There is a Memorandum of Understanding (MOU) between British Columbia and Montana concerning mining and mineral extraction activities. Any improvement option(s) forwarded would need to be evaluated as it relates to the MOU. The status of the MOU and negotiations pertaining to protection of the North Fork on both the Canadian and U.S. sides is continually evolving as a dynamic process despite differences of opinion as to how best to permanently protect this trans-boundary region.

2.10 Recreation

Existing Recreational Facilities

The NFFR in the Flathead National Forest provides access to recreational opportunities mainly pertaining to the usage of rivers and lakes. The North Fork of the Flathead River is within the National Wild and Scenic Rivers System and is used for floating excursions. While no permits are required for private recreational floating, commercial outfitters, offering float trips, are required to obtain permits. This corridor provides the public with driving opportunities to view and access the non-wilderness portions of the national forest. Some of the best huckleberry picking in Montana is in the Flathead National Forest. This area provides hunting and fishing opportunities throughout the corridor. Over 3,000 visitors entered Glacier National Park in 2009 during July and August, with an average monthly entrance of 1,500 visitors through Polebridge located north of the corridor study area. Approximately an average of 3,000 visitors per month enter at the Camas Road entrance.

The NFFR provides access to many camping opportunities in designated campsites and at undeveloped campsites from Columbia Falls to Polebridge and north. The Big Creek campground near milepost 20.5 provides camp sites and access to the river for fishing and floating. The Big Creek Outdoor Education Center of The Glacier Institute is located in the study corridor and is visible from the NFFR near Big Creek. Since 1988, the Big Creek Center has been home to a Youth Science Adventure Camp, Discovery School and several adult field courses. The center operates under a special use permit with the Flathead National Forest.

Winter recreation opportunities also exist in the corridor study area, including cross country skiing, snowmobiling and sightseeing. The number of visitors to the area in winter months is much less than during the summer months, based on traffic information for the roadway.

Planned Recreational Facilities

Planned recreational facilities were not identified in the USFS plan.

2.11 Utilities

No public utilities provide service in the North Fork area. Thus electrical power, water supply, sewerage and garbage removal and other utilities are the responsibility of the individual landowner, at their expense. There is landline telephone service at both Polebridge and the nearby ranger station in Glacier National Park. Some North Fork landowners utilize satellite, radio or cellular telephone service to some degree of success. Others use radios for local communications to neighbors, while a few have installed satellite internet service and have access to email. At time of the adoption of the North Fork Neighborhood Plan, mail delivery was twice a week (Craver, 2010), unless weather conditions make the North Fork Flathead Road impassible (North Fork Neighborhood Plan, Resolution 2143 A; Adopted June 12, 2008).

2.12 Historical, Cultural and Archaeological Resources

A file search of the project corridor was conducted in April 2010. Numerous previous cultural resource inventories were identified and were done mostly for USFS timber sales. Two previously recorded cultural resources adjacent to the road were identified by Montana State Historic Preservation Office. The two sites are 24FH434, a historic ranger station, and 24FH952, a historic trail. Any future reconstruction of the North Fork Flathead Road would require a cultural resource inventory of the corridor.

2.13 Vegetation

Much of the North Fork valley was burned during the late 1800's and early 1900's. The evidence of wildfire was reduced by organized fire suppression since about 1920. Much of the area burned in the period between 1988 and 2003. The corridor study area bisects the 2001 Moose Fire and the 2003 Robert Fire. Many types of vegetation communities exist along the NFFR. These are described in detail in the Environmental Scan, Appendix B.

2.14 Wildlife

Of the 108 mammal species known to occur in the state of Montana, 63 are known to occur in Flathead County and three are suspected to occur (Foresman, 2001). Mule deer, white-tailed deer, elk, moose, black bear, mountain lion, American beaver, porcupine, striped skunk, long-tailed weasel, coyote, red fox, deer mouse, bushy-tailed wood rat, red squirrel, and meadow vole are common mammals occupying habitats in the general area and occur occasionally within the study corridor. White-tailed deer, mule deer, moose, red squirrels and chipmunks were all observed during field reconnaissance, in addition to black bear and elk scat.

The following species occur in the corridor study area: Grizzly bear, black bear, wolf, coyote, red fox, mountain lion, Canada lynx, bobcat, marten, fisher, wolverine, badger, river otter, mink, and various weasels (Weaver, 2001).

The study corridor area is also within important spring, summer, and fall habitat with some winter range areas for white-tailed deer, mule deer, moose and elk. The Flathead National Forest Plan classified the majority of the area within the study corridor as important winter range for these animals.

The corridor study area is also within the distributional range of two reptiles and five amphibian species (Maxell et.al, 2003). No reptiles or amphibians were observed during the field review.

Between 1962 and 2008, the Montana Natural Heritage Program compiled observations of 220 different bird species within the corridor study area (MNHP, 2010). Of the 220 potential species of birds that could occur, 29 are species of concern and eight are potential species of concern.

Between 1998 and 2006, 41 different species were documented with direct evidence of breeding in the corridor study area. These include woodpeckers, swallows, chickadees, owls, raptors such as the bald eagle and northern goshawk; multiple species of waterfowl including the species of concern the common loon, a flycatcher, nuthatch, hummingbird, thrush, tanager, warbler and the white-tailed ptarmigan (MNHP, 2010). Birds observed during the field review were the American Robin, American Crow, and the Cliff Swallow.

Wildlife Habitat Linkage Zones

Wildlife corridors serve as important routes connecting fragmented habitats within an ecosystem. These corridors serve a critical role in the maintenance of viable wildlife populations by promoting species viability. Future development on private land concentrated north of the study section of the NFFR has the potential to sever wildlife corridors. Increased construction on the valley floor has resulted in the likely unintended effect of habitat fragmentation and loss of wilderness and has potential effects on Grizzly bear and wolf (USFS Flathead National Forest Draft Management Plan). However, most of the corridor study area land is federally managed and there is very low potential for development.

2.15 Sensitive Species

Montana Natural Heritage Program Sensitive Species - Heritage Program Rankings

The international network of Natural Heritage Programs employs a standardized ranking system to denote **global** (range-wide) and **state** status (NatureServe, 2006). Species are assigned numeric ranks ranging from 1 (highest risk, greatest concern) to 5 (demonstrably secure, least concern), reflecting the relative degree of risk to the species' viability, based upon available information. Global ranks are assigned by scientists at NatureServe (the international affiliate organization for the heritage network) in consultation with biologists in the natural heritage programs and other taxonomic experts.

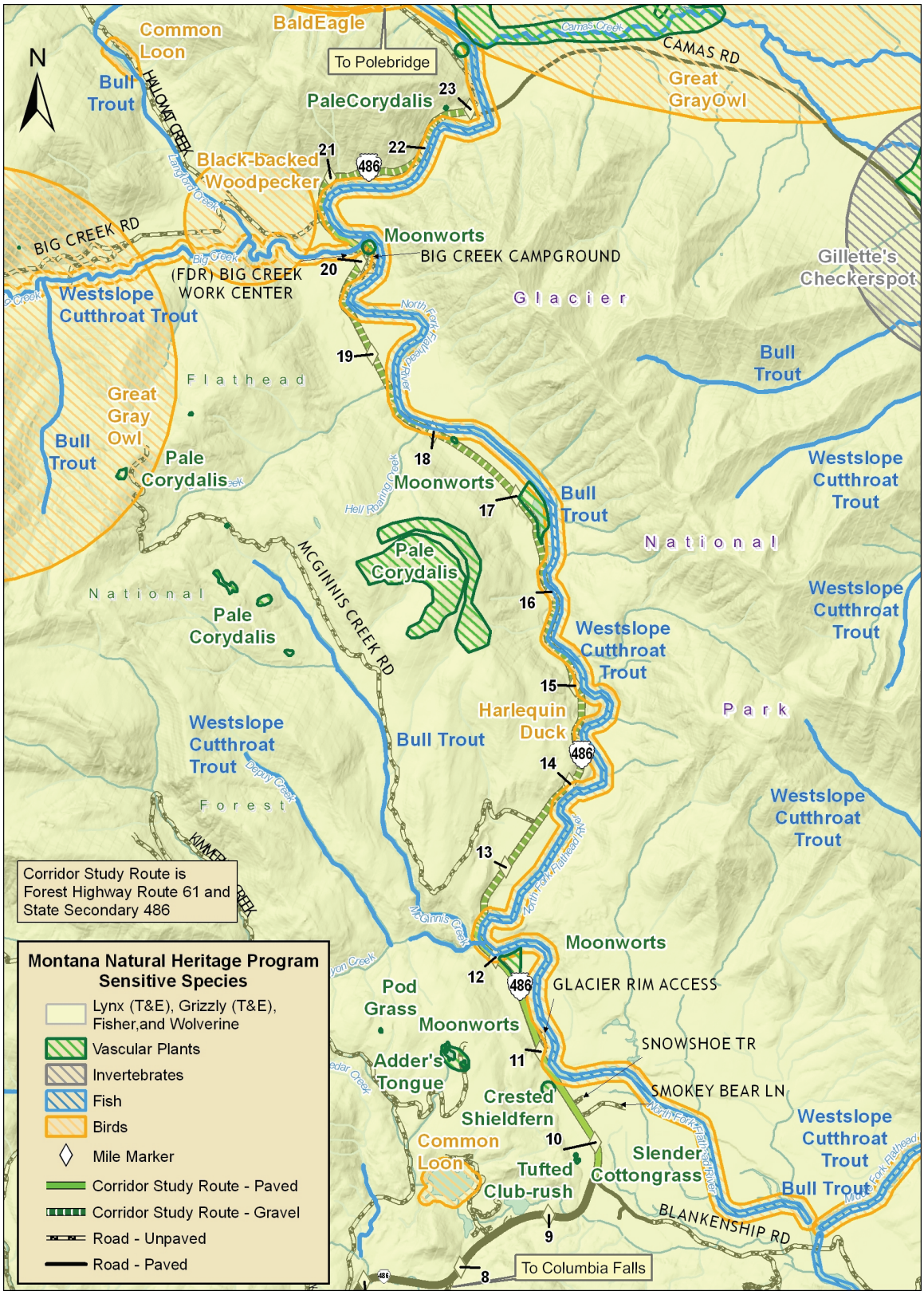
A number of factors are considered in assigning state ranks: population size, area of occupancy in Montana, short and long-term population trends, threats, intrinsic vulnerability, and specificity to environment. Detailed information about the Heritage Program Rankings and sensitive species in the corridor study area is included in Appendix B – Environmental Scan.

Table 2.4 lists the species that have been identified by MNHP and are described in detail within Appendix B – Environmental Scan. The location and distribution of species within the corridor study area are illustrated in Figure 2.3.

Table 2.4 –Montana Natural Heritage Program Sensitive Species

Common Name	*Scientific Name*
Gray Wolf	*Canis lupus*
Fisher	*Martes pannanti*
Wolverine	*Gulo gulo*
Northern Bog Lemming	*Synaptomys borealis*
Harlequin Duck	*Histrionicus histrionicus*
Blackbacked Woodpecker	*Picoides arcticus*
Bald Eagle	*Haliaeetus leucocephalus*
Common Loon	*Gavia immer*
Northern Goshawk	*Accipiter gentilis*
Westslope Cutthroat Trout	*Oncorhynchus clarkia lewisi*
Moonwort	*Botrichium sp.*
Pale Corydalis	*Corydalis sempervirens*
Arctic sweet coltsfoot	*Petasites frigidus var. frigidus*
Meadow Larkspur	*Delphinium burkei*
Tufted Club rush	*Trichophorum cespitosum*
Crested Shieldfern	*Dryopteris cristata*
Pod Grass	*Scheuchzeria palustris*

Figure 2.3 - MNHP Sensitive Species Occurrence in Study Corridor and Surrounding Area



Gray Wolves

Gray Wolves were first delisted from the USFWS Threatened and Endangered Species list on March 28, 2008. Subsequent litigation resulted in the wolves being re-listed on July 18, 2008. Wolves were delisted for a second time on May 4, 2009. On August 6, 2010, Judge Molloy ruled to restore federal protection under the endangered species act to the Rocky Mountain Grey Wolf.

There are three documented wolf packs in the North Fork Valley outside of Glacier National Park, two of which utilize the NFFR corridor study area within their home range. In the rugged topography of the Rocky Mountains, such as within the corridor study area, wolves select valley bottoms and lower slopes where they incorporate key wintering sites of ungulates (deer, elk, and moose) in their travels (Weaver 1994, Singleton 1995, Boyd-Heger 1997). Wolves use the valley bottom intensively from Sage Creek (B.C) down to Camas Creek, particularly areas east of the river (Weaver, 2001). Impacts to wolves must be evaluated for any roadway improvement projects to move forward.

Further information regarding sensitive or threatened/endangered species can be found in the Environmental Scan in Appendix B.

2.16 Threatened and Endangered Species

Threatened and endangered species include those listed or proposed for listing by the USFWS as threatened or endangered. Under Section 7 of the Endangered Species Act (ESA), as amended, activities conducted, sponsored or funded by federal agencies must be reviewed for their effects (direct, indirect and cumulative) on species federally listed or proposed for listing as threatened or endangered. The following listed, proposed and candidate species were considered with respect to this corridor (USFWS, 2010):

Table 2.5 – Threatened and Endangered Species

Common Name	*Scientific Name*	ESA Status
Bull Trout	*Salvelinus confluentus*	**LT/CH/PCH**
Canada Lynx	*Lynx canadensis*	**LT/CH**
Grizzly Bear	*Ursus arctos horribilis*	**LT**
Spalding's Catchfly (a.k.a Spalding's Campion)	*Silene spaldingii*	**LT**

LT = Listed Threatened CH = Critical Habitat PCH = Proposed Critical Habitat

Spalding's Catchfly

Spalding's Catchfly exists in only a few locations in the northwest corner of the state. Extant occurrences are known in the following areas: Tobacco Plains area, Lost Trail National Wildlife Refuge, the Niarada area and on Wild Horse Island. The majority of occurrences have less than 100 individuals, though the largest population range-wide occurs in the state and is estimated to contain several thousand plants. One historical occurrence exists from the Columbia Falls area.

No known occurrences of Spalding's Catchfly have been reported to occur in the corridor study area. If Spalding Catchfly is found to be impacted by any future proposed project, USFWS consultation would be required.

Bull Trout

The North Fork of the Flathead River is mainly comprised of the migratory life form of bull trout. Bull trout live in the Flathead River and Flathead Lake as adults then migrate upstream to spawn in tributaries of the North Fork. Young bull trout may rear from one to several years in these tributaries of the North Fork before migrating downstream to the North Fork, the main tributary of the Flathead River and Flathead Lake, where they will spend the majority of their adult life. The North Fork of the Flathead River is considered Nodal habitat serving as a critical migratory link for bull trout migrating upstream to spawn in tributaries such as Big Creek. Big Creek is considered Core habitat (drainages containing the strongest remaining populations of bull trout in the restoration area) in the Flathead drainage.

The presence of bull trout in the North Fork of the Flathead River and its tributaries does not preclude Flathead County or MDT from upgrading the existing roadway facilities; however, timing or other restrictions may apply to in-stream work to avoid or minimize sediment related impacts to spawning fish or their eggs. If a project were to evolve from the corridor study, extensive coordination with fish biologists from the USFWS and MFWP would be necessary under Section 7 of the ESA to go through the Jeopardy analysis, whether any "take" of bull trout is anticipated, whether there are impacts to proposed critical habitat and what conservation and coordination measures can be taken to minimize the amount of potential "take".

Canada Lynx

The corridor study analysis area for lynx is within the Lower Big and Canyon Lynx Analysis Units (LAU).

The status and trend of lynx in the Flathead National Forest is not known. Track surveys along the NFFR in the winters of 2000-01 and 2001-02 documented lynx to the north of Polebridge, but none south of Polebridge (Edmonds et al., 2002).

The NFFR itself is within designated lynx critical habitat. Discussions with Flathead National Forest wildlife biologist (R. Kuennen, 2010) indicate that on Flathead National Forest lands, designated critical habitat extends all the way down to the banks of the North Fork of the Flathead River. On the Glacier National Park side, it begins at 4,000 feet in elevation and extends above into the high alpine forests of the park. Impacts to lynx would need to be evaluated for any improvement option proposal advanced into a project for the corridor study area.

Grizzly Bear

The NFFR corridor study area lies within the boundaries of the Northern Continental Divide Ecosystem Recovery Zone. Grizzly bears in the North Fork area have been studied for over 30 years. A proposed road paving project along HWY486 back in the late 1970's and early 1980's was found by the USFWS to have the potential to Jeopardize the continued existence of the listed threatened Grizzly bear in 1980 and 1982 (USFWS, 1980, 1982). Grizzly bears are known to occur throughout the North Fork valley with higher densities further north closer to the Canada - U.S. border. GPS telemetry of individual Grizzly bears indicates that Grizzly bears do occur within the corridor study area in particular at the southern end and the northern end near Great Northern Flats and the confluence of Big Creek and the North Fork of the Flathead River (Servheen and Williams, 2010).

Any proposed roadway improvement options resulting from the NFFR Corridor Study or future project development would need to be reviewed for potential impacts to Grizzly bears and their habitat. It is likely that any proposed roadway project beyond maintenance of existing conditions would likely result in formal consultation under Section 7 with the USFWS. This consultation is required if federal funds or a federal action is involved. This consultation is required especially if an improvement option would increase traffic speeds, lead to increased development, or increase traffic volumes.

2.17 Water Quality, Wetlands, Water Resources and Fisheries

As part of the existing conditions review of this corridor study, wetlands were observed and noted in the field; however, no formal wetland delineation was conducted for this study. Formal wetland delineation would be necessary for any proposed highway-related actions as required by Section 404 of the Clean Water Act and Executive Order 11990, Protection of Wetlands.

The North Fork area has abundant wetland and riparian habitat due to previous glaciations, high precipitation and the development of floodplain landforms along the North Fork of the Flathead River. Thus, riverine and depressional wetlands are the most widespread wetland types (Cooper et.al, 2001).

The riverine fluvial processes are intact and support the development of early and late seral cottonwood stands. Mature cottonwood gallery forests have an intact native shrub understory. The National Wetlands Inventory (NWI) has been completed for Flathead County. However, the NWI is not inclusive of all wetlands that are in the corridor study area. The corridor study area inventory is illustrated in Figure 2.4, NWI Wetlands.

Wetland plant communities and their conservation ranks for North Fork of the Flathead wetlands arranged by Cowardin system, class, and subclass were taken from Cooper et.al, 2000. A full list of vegetation communities can be found in the Environmental Scan (Appendix B).

Streams and Fisheries

Big Creek

Big Creek is a major tributary to the North Fork of the Flathead River. Big Creek is a key spawning stream for bull trout and westslope cutthroat trout because of the clean water and its physical characteristics (Sirucek et.al, 2003). Big Creek is listed as Core habitat under the currently Proposed Critical Habitat for Bull trout by the USFWS. Big Creek is presently partially supporting the beneficial uses of aquatic life support and cold-water fishery as defined by the Montana Department of Environmental Quality (DEQ). The DEQ Clean Water Act Information Center (http://cwaic.mt.gov/) shows that Big Creek is listed as water quality impaired (i.e., listed as water quality impaired under Section 303(d) of the Clean Water Act). It provides only partial support for aquatic life and cold water fishery uses due to sediment/siltation and alteration in stream-side or littoral vegetative covers from forest roads (road construction and use) and from stream bank modifications/destabilization

North Fork of the Flathead River

The North Fork of the Flathead River parallels the corridor study and comes close to the roadway in some areas. It flows through a broad alluvial valley with braided and anastomosed channels and expansive floodplains. The North Fork of the Flathead River corridor offers nearly intact ecological connectivity. Biota are able to migrate longitudinally from headwaters to the confluence with the Middle Fork and on to Flathead Lake. The expansive floodplains of the river link the channel to the uplands and foster movements between Glacier National Park and the Whitefish Range.

The North Fork of the Flathead River divides the Flathead National Forest from Glacier National Park. The upper 41 miles above the Camas Creek Bridge are classified as Scenic under the 1976 Wild and Scenic Rivers Act. The lower 17 mile section to Blankenship Bridge and the confluence of the Middle Fork is classified as Recreational.

The North Fork of the Flathead River is a migratory route to spawning tributaries from Flathead Lake for bull trout and Westslope cutthroat trout. The North Fork of the Flathead River is currently listed as nodal habitat in the USFWS Proposed Critical Habitat for Bull trout. Other fish species present in the North Fork of the Flathead River include: Arctic Grayling, Lake Trout, Largescale Sucker, Longnose Sucker, Mottled Sculpin, Mountain Whitefish, Rainbow trout, Slimy Sculpin, and Westslope X Rainbow hybrids (MFWP, MFISH, 2010).

Canyon Creek/McGinnis Creek

Canyon Creek is a perennial tributary to the North Fork of the Flathead River. While this is a small watershed it is directly connected to the North Fork of the Flathead River. Approximately 600 to 800 feet upstream of the North Fork Flathead Road crossing of Canyon Creek via culvert, McGinnis Creek joins Canyon Creek. McGinnis Creek is a perennial stream. Both Canyon and McGinnis have common bull trout occurrence within the first mile of stream reach. In the upper reaches of these streams, genetically pure strains of westslope cutthroat trout persist (MFISH, 2010).

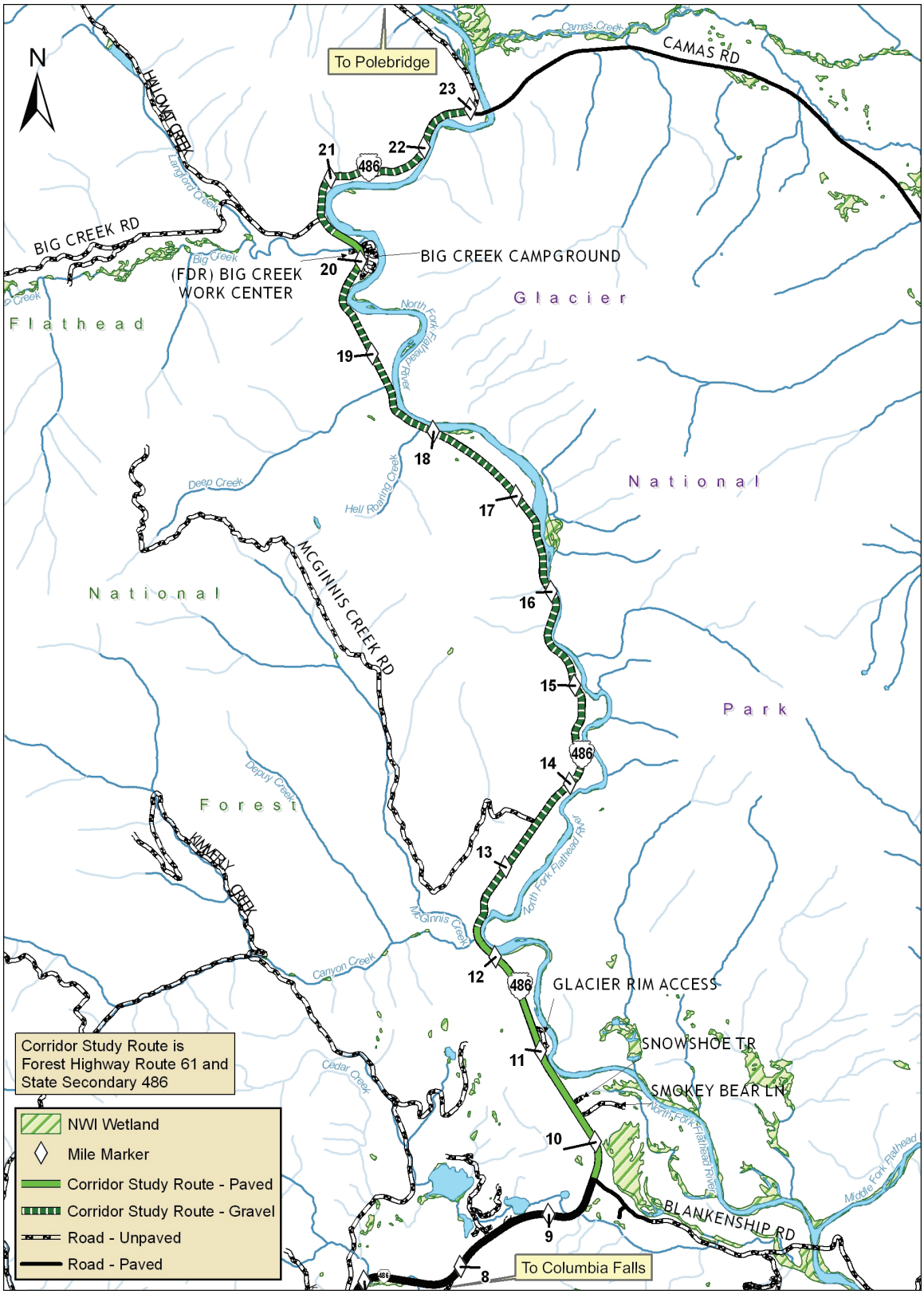
Hell Roaring Creek

Hell Roaring Creek is an intermittent stream that feeds directly into the North Fork of the Flathead River. It is a very small tributary; little to no fisheries information is available for this stream (MFISH, 2010).

Deep Creek

Deep Creek is a perennial tributary to the North Fork of the Flathead River. The culvert at the NFFR crossing is undersized, and has a stand pipe installed which restricts bedload conveyance as well as fish passage (Deleray, 2010). Flathead County periodically must get an SPA-124 authorization to excavate bedload from the channel upstream of the culvert. The culvert also is acting as a fish barrier preventing non-native rainbow trout in the North Fork of the Flathead River from migrating upstream and mixing with the genetically pure strains of westslope cutthroat trout in the headwaters of Deep Creek. If the NFFR should undergo improvements in this area, consideration should be taken to size a culvert to accommodate passage of bed load, but to maintain a fish passage barrier (Deleray, 2010).

Figure 2.4 - NWI Wetlands



Floodplains

Executive Order (EO) 11988, Floodplain Management, requires federal agencies to avoid direct or indirect impact of floodplain development whenever a practicable alternative exists. FHWA Policy and Procedures for Location and Hydraulic Design of Highway Encroachments on Floodplains (23 CFR 650 Part A) and EO 11988 requires an evaluation of project alternatives to determine the extent of any encroachment into the base floodplain. The base floodplain is the regulatory standard used by federal agencies and most states to administer flood plain management programs. A base floodplain, also known as a 100-year floodplain, is defined as lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, with a one percent or greater chance of flooding in a given year. As described in FHWA's floodplain regulation (23 CFR 650 Part A), floodplains provide natural and beneficial values serving as areas for fish, wildlife, plants, open space, natural flood moderation, water quality maintenance, and groundwater recharge.

The 2007 Flathead County Flood Insurance Rate Maps depict an approximate delineated base floodplain for the North Fork of the Flathead River and Canyon Creek. A detailed hydraulic analysis was not done to determine flood elevations. A formal floodplain permit may be required if any work is done in areas shown within the floodplain boundary. Flathead County Floodplain regulations require that the base floodplain elevation is not increased by more than 0.5 feet in a delineated floodplain.

Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.

Each river is administered by either a federal or state agency. Designated segments need not include the entire river and may include tributaries. For federally administered rivers, the designated boundaries generally average one-quarter mile on either bank in the lower 48 states and one-half mile on rivers outside national parks in Alaska in order to protect river-related values.

Rivers are classified as wild, scenic, or recreational, and are defined below.

- Wild river areas —Rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- Scenic river areas — Rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- Recreational river areas — Rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

The North Fork of the Flathead River originates 50 miles across the border in British Columbia, Canada. The river divides the Flathead National Forest on the west from Glacier National Park on the east. The upper 41 miles of the river above the Camas Creek Bridge (north of the corridor study area) are classified as Scenic under the Act; the Flathead National Forest manages this Wild and Scenic River. The lower 17 mile river section from the Camas Creek Bridge to the Blankenship Bridge and the confluence of the Middle Fork is classified as Recreational. The section of the river adjacent to the corridor study area from the Camas Creek

Bridge milepost 22.7 to approximately milepost 10.7, where the North Fork of the Flathead River turns east away from the road, is classified as Recreational.

2.18 Air Quality

The NFFR, within the corridor study area, is a predominantly gravel roadway that was last improved in 1987. This section of the NFFR is considered by many to be a rough, wash-boarded road the majority of the year and dusty during the warm summer months. Flathead County Road Department is responsible for maintaining this road. Maintenance activities include grading the roadway and applying dust suppressants (as necessary).

In 2007, the Montana Department of Environmental Quality issued an Administrative Order on Consent (AOC) to Flathead County for emissions of airborne particulate matter from unpaved roads in the county. To resolve the AOC, Flathead County agreed to a Supplement Environmental Project (SEP) for dust abatement activities on unpaved roads in the county. The SEP included the following:

- Implementing a dust abatement program on gravel county roads;
- Installing speed limit signs indicating a mandatory speed limit of 35 mph and a recommended speed limit 20 mph for all unpaved roads; and
- Hiring a half-time sheriff deputy to enforce speed limits on gravel county roads.

Since Flathead County maintains the majority of the NFFR, the corridor study area is included in this SEP. Activities under the SEP are considered maintenance and are requirements of the county.

Non-attainment Areas

EPA designates communities that do not meet National Ambient Air Quality Standards **(**NAAQS**)** as "non-attainment areas." States are then required to develop a plan to control source emissions and ensure future attainment of NAAQS. The corridor study area is not located in a non-attainment area for PM-2.5, PM-10, or carbon monoxide (CO). The nearest designated PM-10 non-attainment area is located in the City of Columbia Falls, approximately eight miles south of the southern end of the corridor study. There are no nearby PM 2.5 or CO non-attainment areas.

Class I Airsheds

Glacier National Park is a mandatory Class I Airshed and is located adjacent to the corridor study area, on the east side of the North Fork of the Flathead River. Class I Airsheds are considered the most pristine airsheds in the country. Therefore, state and federal air regulators are required "to preserve, protect, and enhance the air quality" in these areas. Designation as a Class I area permits only small incremental increases in new air pollutants. Of particular concern in these areas is visibility (or haze).

Road dust is primarily comprised of larger particles (PM10 and larger) that travel relatively short distances before setting back to the ground or adhering to vegetation. Therefore, road dust is not likely to be a significant contributor to regional haze in general. The dust from the NFFR, while noticeable along the road itself, is likely not the right size, or travelling in sufficient quantity or for a sufficient distance to have any meaningful impact on park visibility related to the Class 1 Airshed inside the park boundary.

A requirement of the Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act (CAA) require that new major stationary sources, or major modifications of existing stationary sources, must first receive a PSD permit before implementing construction. A

stationary source is one that is well defined, such as the stack(s) of a coal-fired power plant. Maintenance or reconstruction activities on the NFFR would not be a major stationary source; therefore, these activities would not be subject to the PSD permitting process.

2.19 Potential Hazardous Sites

The Montana Natural Resource Information System (NRIS) database was searched for underground storage tank (UST) sites, leaking underground storage tank (LUST) sites, abandoned mine sites, remediation response sites, landfills, National Priority List (NPL) sites, and toxic release inventory sites in the vicinity of the NFFR along the corridor study area. There were no UST sites, LUST sites, abandoned mine sites, remediation response sites, landfills, NPL sites, or toxic release inventory sites identified in the vicinity of the corridor study area. Because there were no sites identified in the corridor study area with potential environmental concerns, it appears unlikely that soil or groundwater contamination would be encountered during any improvement projects on the NFFR.

3.0 Consultation and Coordination, Public Involvement

This section describes activities for public involvement conducted during the NFFR Corridor Study process. The process was designed to be inclusive, comprehensive, open, transparent, and continuous throughout. The activities were designed to maximize public and agency comments. Activities included stakeholder interviews and two public open house meetings, and were supported by informational newsletters, an informational web site, local and state-wide press releases, and public correspondence as needed. A mailing list was created to communicate with elected officials, landowners, stakeholders, and other interested parties.

3.1 Public Information Meeting #1, April 20, 2010

The goals of the first public meeting for the NFFR Corridor Study were:

- To inform the public of the corridor study and to explain how their input is needed to identify issues along the corridor.
- To obtain a better understanding of the roadway users, local interest of the road and future needs of the corridor.
- To address questions about the corridor study area, goals of the study and potential improvements for the roadway.
- To provide education about corridor planning in general and specifically how it applies to this study.

Meeting Description and Context

Flathead County requested an informal open house to begin the meeting followed by a formal presentation given by the study team. The county also recommended that a question and answer period be facilitated to generate public participation and address any issues or concerns. The meeting followed the recommendations of Flathead County.

The meeting was held from 6 p.m. to 8 p.m. at Columbia Falls City Hall in the Council Chambers, 130 6th Street West. Those in attendance included North Fork Flathead Road property owners, business owners, residents of Columbia Falls and Polebridge, and representatives from special interest groups. Copies of the sign-in sheets are included in the Appendix A as part of the meeting notes.

Public Notification

Letters were sent to property owners two weeks before the meeting. Additional notification was sent out by MDT's Public Involvement office in a state-wide press release, notification was posted on the study website, and paid advertising was placed in the Kalispell Daily Inter Lake and The Hungry Horse News:

- **The *Kalispell Daily Interlake*** is published daily. Two ads ran–Sunday, April 4 and 18, 2010.
- ***The Hungry Horse News*** is published on Wednesdays. Two ads ran–Thursday, April 1 and 15, 2010.

A copy of the approved ad is in Appendix A–Consultation and Coordination, Public Involvement.

Meeting Format

The doors opened 30 minutes before the formal presentation to allow the public to view maps and find their seats. The presentation was followed by a question and answer session. Then the

public was encouraged to provide written comments on comment forms. There were 73 people that signed in and 22 written comments were received at the meeting.

A formal PowerPoint presentation was given by the PB project manager with assistance from Commissioner Dupont, Flathead County and MDT. The PowerPoint presentation served as a guide for discussion, to provide information, and to stimulate public participation. A copy of the PowerPoint presentation is included in Appendix A. The public provided comments and participated in the discussion. Following the presentation the meeting was opened to questions where study staff members were available to answer questions and assist with gathering comments. A summary of the comments, questions and answers follows below.

Handouts provided to the public at the meeting include a meeting agenda, a corridor study area map, and comment forms. A copy of the meeting agenda handout is included in Appendix A.

Meeting Summary

This synopsis of transcribed verbal comments and questions is from the April 20, 2010 public meeting; full write-up of these comments are captured in the meeting minutes and are part of Appendix A.

The most frequent concern raised was roadway dust and the potential driving hazards it poses, including: requirements for drivers to travel at slower speeds, speed limit enforcement or lack thereof, reduced visibility, impacts on air and water quality, impacts to view shed and recreation.

Remarks regarding the timeliness of emergency service response to the community of Polebridge and other residents north of the corridor study area were discussed. Some of those who expressed concerns related to safety said they think that paving the gravel portions of the road will improve the unsafe road conditions they see. These include washboard driving surface, dust, and overall slow driving conditions, which the residents feel are causing delays for emergency services.

Other comments requested that the study look at ways to minimize the potential for wildlife impacts including collisions in the corridor and expressed concern that if the gravel roadway sections are paved the increased speed will result in unsafe conditions for wildlife and motorists. Many stated that traffic is increased in the summer with GNP tourists coming from Camas Road.

Several participants were unclear about the ownership/jurisdiction and which entity is responsible for maintenance of the roadway within the corridor study area. A Frequently Asked Questions (FAQs) document and a map of this were prepared and made available on the study website. The FAQs and map will help clarify roles and responsibilities.. Others pointed out that the roadway was too wide and this adds to the roadway maintenance expenses.

Columbia Falls' Mayor submitted a proclamation at the meeting advocating roadway improvements including paving of the gravel portion of the roadway in the corridor study area.

Many comments included discussion of the recent compact passed in February 2010. This compact was signed by Montana Governor Schweitzer and British Columbia Premier Gordon Campbell. It is a comprehensive "memorandum of understanding". This document will halt ongoing exploration work and prohibit future development in the Canadian river valleys north of Glacier National Park. This compact addresses limits on development of oil and gas and mining. This led to discussion of economics and concerns raised around this issue, including balancing demands on this ecosystem, future development, tourism, and distribution of taxes for all the county roads, not just NFFR.

All participants were encouraged to visit the study website as it was updated and were advised that they will be informed of additional ways to participate in the process.

3.2 Issues and Comments by the Public

Although the Study Team asked for and encouraged input on road issues, the general public offered polarizing solutions of “pave” and “do not pave.” The public then provided issues, concerns and opinions about their choice of solution. The following issues, ideas and statements were identified as a result of written comments.

Against paving because it will create these issues:

- Promote development, overpopulation, commercialization, speeding, increased traffic, increase in visitors, noise and trash, habitat modification; additional dangers to threatened and endangered species, increase in illegal poaching, wildlife/vehicle collisions.
- Negatively impact wildlife safety and health, water quality, Grizzly bear safety and health, the environment overall, stream habitat, quality of life, this area being the “last best special place”, could impact the BC negotiations, historic character, the remoteness of the area, unknown impacts with paving, increase or cause ecological problems, pollution from runoff (into river and streams) if paved, the remoteness of this area, values, the character of northern communities.

For paving because it will offer these benefits:

- Create employment, local business economic boost, economic benefits (of creating an) alternative route for visitors (to GNP), help Border Patrol, USPS, improve emergency response.
- Eliminate/reduce dust pollution to people, animals, plants and trees, visibility, air and water quality, health and safety issues, dust impacts on the Clean Air Act, issues to vehicles due to washboard conditions, road ruts and potholes due to standing water and poor drainage.
- Expand scenic opportunities.

Suggestions that were given included, proper gravel and dust abatement measures, improve safety and reduce dust by narrowing road, crowning, suggest dust coat, improve and maintain the gravel and enforcing speed limit, other improvements, like grading or dust mitigation, consider oil treatment, use non-paving alternatives to (improve) road, improvements to the entire NF to the border, re-gravel, consider oil treatment if paving is not an option, grading not enough, law enforcement and more signage to reduce speeding, guardrails are needed (north of the corridor study area).

The following list of issues and concern statements are those made as comments from members of the public and may or may not be accurate representations, based on analysis related to the NFFR corridor study area.

Issues, Concerns and Questions from the Public:

- NF is a gem biologically.
- Pave other roads that have more use/traffic where it would be a better use of the money, lack of traffic to justify paving NFFR.
- Keep wild and natural.
- As roads are paved in GNP why not here?
- Another entrance to GNP not needed; some improvement without paving needed.

- Driving dirt road part of what makes spending time in area nice experience.
- There are high traffic counts.
- Character/natural beauty authentic Montana important to locals and the world.
- (With the) 1980s widening proposal it was determined to have environmental impact on wildlife, (so again) paving won't progress beyond courts.
- Address walking/biking safety.
- How does siltation impact fish quality in NF River? How does paving impact grizzlies?
- Development not issue because of limited private land, zoning and septic tank permits.
- This is un-maintainable section of road because road is too wide.
- If 19 environmental groups suing, why do this study?
- Need consistency in decision-making process; road dangerous-dust, lack of maintenance, high traffic, too high costs to maintain dirt road.
- Pave the bottom portion and turn it over to the state to maintain.
- Polebridge to Canadian Border is really bad.
- Non-paved road has kept land and animals intact.
- ALERT (Advanced Life Support and Emergency Rescue Team) is too expensive.
- Should focus on drainage issues before considering paving.
- Do realistic economic analysis -road dollars would be better spent elsewhere.
- Zone adjacent private properties to alleviate concerns about development.
- British Columbia/Montana Memorandum of Understanding (MOU).
- Support reduced speeds.
- Use the money for the study to improve the road instead.
- Dust is a natural ingredient-paved road materials are not natural to the environment.

Summary of Public's Issues and Concerns

Some members of the public indicated that paving is necessary to decrease dust and improve health and safety.

Some members of the public indicated that paving would devastate the natural and scenic beauty of the area and is not necessary. They recommended:

- Crowning the road.
- Narrowing the road.
- Using dust control methods.

Some members of the public said using tax payers dollars to pave this roadway is not a good use of the money when there are hundreds of miles of unpaved roads in Flathead County, many of which have higher traffic volumes.

3.3 Stakeholder Interviews

Stakeholder interviews began in May. This allowed the study team to better understand the issues and concerns with the study corridor roadway from the stakeholders' perspective. The following describes the process that occurred to accomplish this task.

Stakeholder Interview Description

Stakeholders were individually chosen as a representative for a community sub-group for which they are a member or a leader. These sub-groups include representatives from the business community, the environmental community, the local government and the community at-large. Interviews were conducted by telephone.

Goals of the Stakeholder Interviews

- To inform the stakeholders of the study and to explain how their input is needed to identify issues specific to them or the group they represent.
- To obtain a better understanding of the stakeholder interest of the current roadway, and their future needs of the corridor.
- To discuss potential improvements for the roadway.

Results

In general most of the stakeholder interview results reflect what the study team has heard in comments received during the April 20 meeting or from website, email and US mail. However, stakeholders offered more depth and explanation in this format. The summary of all stakeholder interviews and individual verbatim interviews can be found in Appendix A.

The most frequently cited concerns for travel and safety on the roadway were the condition of the roadway with washboard surface, potholes resulting from poor drainage, and dust.

The need for expedited travel for emergency service vehicles for increasing number of visitors to the area, concerns for preservation of the natural character of the area, not impacting wildlife, fragmenting habitat, creating more impacts to the natural environment including degrading water and air quality and maintaining the values of Glacier National Park with any roadway improvement were other common concerns discussed during the interviews.

A few stakeholders asked to remain anonymous. The following list identifies the role the person has and the group or association they represent. The Stakeholders listed in Table 3.1, Stakeholders/Organizations, were interviewed for the Study:

Table 3.1 – Stakeholders/Organizations

Role/Title	Association
President and Vice President	North Fork Land Owners Association
Key Staff	Fire Department and Emergency Services
Representative	National Parks Conservation Association
Individual	Property Owner
Senior Command	U.S. Border Patrol
Trail Manager	Recreational Trails, Department of Montana Fish Wildlife and Parks
Leader Member	National Resource Defense Council
Tour Manager	Adventure Cycling
Leader Member	North Fork Preservation Association
Leader Member	North Fork Compact
Member	North Fork Coalition for Health and Safety
Key Staff	Columbia Falls Chamber of Commerce
Owners	Guides and Rafting Outfitters
City Official	City of Columbia Falls

3.4 Resource Agency Meeting

A resource agency meeting was held April 21, 2010. Complete meeting notes can be found in Appendix A.

The agency meeting provided an opportunity for the study team to receive input from the agencies regarding issues and concerns along the NFFR corridor study area. It also offered agencies the opportunity to provide a better understanding of land management plans or other constraints or regulations that might affect the corridor.

The Corridor Study Process overview was given by the consultant with support from MDT. A summary by the consultant's Public Involvement Coordinator of the public meeting on April 20- included the main issues and concerns raised by the public. A roundtable discussion of issues/concerns pertinent to each agency's mission and responsibilities was conducted. The website address was made available to everyone for future reference:

http://www.mdt.mt.gov/pubinvolve/northfork.

A corridor tour occurred for meeting attendees directly after the meeting.

3.5 Public Information Meeting #2, July 27, 2010

The goals of the second public meeting for the NFFR Corridor Study were:

- To obtain comment on the Draft Corridor Study document,
- To address questions about the corridor study area, goals of the study and potential improvement options for the roadway.

Meeting Description and Context

The purpose of the meeting was to obtain comment on the Draft Corridor Study, released for public review on July 15, 2010. The meeting was held from 6:30 p.m. to 8:30 p.m. at Discovery Square in Columbia Falls, 540 Nucleus Avenue. Those in attendance included North Fork Flathead Road property owners, business owners, residents of Columbia Falls and Polebridge, and representatives from special interest groups. Copies of the sign-in sheets are included in the Appendix A.

Public Notification

Letters were sent to property owners along the corridor study area two weeks before the meeting. Additional notification was sent out by MDT's Public Involvement office in a state-wide press release, notification was posted on the study website, and paid advertising was placed in the Kalispell Daily Inter Lake and The Hungry Horse News:

- **The *Kalispell Daily Interlake*** is published daily: Two ads ran; July 11 and July 25, 2010.
- ***The Hungry Horse News*** is published on Wednesdays: Two ads ran; July 8 and July 22, 2010.

A copy of the approved ad is in Appendix A–Consultation and Coordination, Public Involvement.

Meeting Format

The meeting was conducted in an Open House format discussion. It is a method for members of the public to ask questions individually and to provide comments with a court reporter. There were 43 people that signed in; 17 people gave verbal comments to the court reporter and 13 written comments were received at the meeting.

The handouts provided to the public at the meeting include a meeting agenda, and comment forms. Copies of the meeting handouts are included in Appendix A.

Summary of Comments received at July 27 meeting

Some comments received requested that the study look more closely at ways to minimize the potential for wildlife impacts including collisions in the corridor. They also expressed concern that if the gravel roadway sections are paved the increased speed will result in unsafe conditions for wildlife and motorists. Many stated that traffic increases in the summer with GNP tourists coming from Camas Road.

Many comments included discussion of the recent compact passed in February 2010. This compact was signed by Montana Governor Schweitzer and British Columbia Premier Gordon Campbell. It is a comprehensive Memorandum of Understanding (MOU). This document is designed to halt ongoing mining, oil and gas exploration work and prohibit future development in the Canadian river valleys north of Glacier National Park.

Many comments discussed economics and concerns raised around this issue. These included balancing demands on the North Fork ecosystem, future development, tourism, and distribution of taxes for all the county roads, not just NFFR.

Summary of Comments received on the Draft after July 27 meeting

A total of 93 comments were received by the study team after the Draft was published for public review on July 15, 2010 to August 21, 2010. The public perspective gained through public involvement efforts found no agreement was attained based on the conflicting comments received. This resulted in no single option or group of improvement options emerging as a recommended priority for this corridor. Many members of the public stated that if they could not have their preferred option (for instance “pave” or “no-pave”), their preference would be to have better maintenance and if at all possible, one of the dust abatement treatment options. Several specifically stated that the study should have been a regional study to address all unpaved roads in the county, not just this stretch of roadway. Many other comments received that were directed at contents of the Draft have been addressed as appropriate within this Final version of the study. The individual comments received through August 21 are available for review on the website and on a CD as part of the Final document.

3.6 Other Public Information Efforts

The following activities were ongoing efforts to engage the public in the corridor study process:

- The study website: www.mdt.mt.gov/pubinvolve/northfork was updated as often as necessary and included corridor study area maps, study process information, meeting information, a comment form and frequently asked questions.
- A newsletter with updated study information was sent out on June 6, 2010, to everyone on the study mailing list, either by email or hardcopy. Additional copies of the newsletter were sent to the local library, the City of Columbia Falls, Flathead County, MDT Kalispell office, NFLA, and the Polebridge Mercantile.
- A second newsletter was distributed to everyone on the study mailing list. Additional paper copies were mailed to interested persons and to previously identified community locations.
- All study materials had the web address, physical address and email address to allow members of the public to provide comments to the study team easily.
- Study team staff responded to many interested members of the community by telephone and email.

The study team received 243 total comments by August 21, 2010.

4.0 Improvement Options Development and Funding Mechanisms

Based on the technical analysis and the process described in Section 3, possible improvement options for the NFFR were evaluated. A comprehensive set of options were documented for initial consideration in the preliminary stages of the corridor study. The options were then placed in a screening criteria matrix to facilitate a comparison of the options.

4.1 Main Issues

A list of main issues in the corridor that could be improved included:

- Dust mitigation
- Impacts on wildlife
- Roadway surface conditions, including washboard and potholes
- Maintenance
- Excessive travel speeds
- Roadway safety, namely a crash rate higher than state-wide average
- Emergency services delay
- Maintaining wilderness character of the area

Dust mitigation

On the gravel sections of the road, the existing traffic generates a great deal of dust. This was a common concern with stakeholders and the public. Vehicles traveling at higher speeds result in dusty conditions, which are suspected to contribute to an increase in accidents. Dusty conditions decrease visibility considerably; however dust was never specifically cited as a contributing factor in recorded accident logs. There is also concern from the public that dust from the roadways has potential to affect fish and aquatic habitat, via airborne deposition, or through direct water runoff from the road or nearby dusty vegetation.

Impacts on wildlife

There is little road kill or other crash data involving wildlife available. MDT only removes carcasses from the paved portion of the corridor study area. The degree of kills may not be adequately captured by MDT figures, and conflicting information from stakeholders has been provided on possible kill figures. The team noted that more specific information is needed.

The team agreed that further investigation would be needed to assess whether wildlife is a factor in crashes within corridor. MDT has counted 14 large animal kills over a period of 10 years on the paved portion of the roadway. The maintenance staff only deals with kills within the right-of-way (ROW); therefore, car/animal crashes not resulting in an animal casualty within the ROW may be under-reported. For example, an accident that occurs between a vehicle and animal may result in an injured animal that is able to leave the ROW.

Whether this corridor's wildlife kill differs substantially from statewide data is unknown. Additional coordination between MDT Environmental staff and USFWS staff would be necessary. Paving was an issue in the 1980's, resulting in a Section 7 "Jeopardy" ruling based on wildlife concerns.

If the road is paved, animal-vehicle collisions could increase. One way to mitigate this would be to provide wildlife crossing structures as part of any pavement options. The advantage is that since the land is Forest Service land, there is no private development that would be affected.

Fencing could channelize wildlife to crossing structures in areas where animals currently do cross, such as migration routes, to be most effective. This would require specific identification of where the best crossings would be located. Placing structures at one mile intervals could cost up to $13 million, which could be prohibitive. Without supporting data to quantify the need and location, this expenditure cannot be defended at this time.

Roadway Surface Conditions

Due to repeated grading cycles, roadway surface materials on the gravel portion of the road have been pushed to the side of the original travel ways, increasing the width of the road. Some areas of the once 36 foot road are reported to now be as great as 44 feet wide. Potholes and wash boarding are common near the end of a grading cycle.

Maintenance

Gravel roadways require a considerable amount of maintenance, including dust control, grading, pothole repairs, and plowing. Due to the small tax base in the corridor study area, Flathead County has concerns about their financial ability to maintain the gravel section of the road. The Roads and Bridges Department spends more on maintenance than is being received in revenue, this is shown in Appendix C, Technical Report, page 98.

Speed

Motorists driving in excess of the posted speed limit of 35 mph in the gravel sections, with an advisory speed of 20 mph during dusty conditions, contribute to the dusty conditions and result in an increase in accidents. Data on tickets issued for speeding per month, or other pertinent enforcement data, is not recorded by the Sherriff's office and is therefore not available.

Roadway Safety

There is a relatively high accident rate within the corridor, as described in Section 2.6. A comparison of accident statistics to average county and/or state accident rates was requested. Average Annual Daily Traffic (AADT) comparisons to county and/or state figures, as available; and an analysis of state-wide AADT were also requested to provide perspective. Narrowing the roadway was raised as an option, but would not resolve the material migration that occurs over time.

Emergency Services

Stakeholders and several public meeting attendees expressed concern about the elapsed time it takes for emergency services to reach their location. One suggested improvement option considers implementing a volunteer fire fighting service. Although this management approach has some merit and may provide some benefit, its implementation is outside the scope of this study.

Maintain the Existing Character of the Area

Many members of the public at the April 20, 2010 meeting and interviewed stakeholders expressed the desire to preserve the existing character of the North Fork valley. These sentiments are more formally expressed in the GNP Management Plan that identifies primitive wilderness as the management strategy for the North Fork section of GNP.

4.2 Potential Improvement Options

All potential improvement options itemized in the improvement options meeting were reviewed and discussed amongst meeting attendees. The options were collated into categories based on similarity. Each option is listed in Table 4.1 and then described on the following pages.

Table 4.1 – Potential Improvement Options

Improvement Options	
1	No-action
2	Maintenance
2a	Additional grading of current road
2b	Guardrail Installation
3	Stabilization Treatments
3a	Bentonite
3b	Magnesium chloride/ calcium chloride
3c	Lignin
3d	Black oil
3e	EnviroKleen
3f	RoadOyl
3g	SoilSement
3h	Dead wood and vegetable oil
3i	Soybean oil byproduct
4	Improve Gravel Surfacing
4a	New gravel lift
4b	Double shot/bitumen
4c	Driving Surface Aggregate (DSA)
5	Speed Enforcement/reduction Strategies
5a	Speed indicator signs (solar)
5b	Speed dips
5c	Narrow the gravel roadway
5d	Police car with dummy
5e	Additional signage (safety or speed limit)
5f	Fund additional law enforcement
5g	Educational effort to reduce speeds
6	Bituminous Surface Treatment/Asphalt Concrete Pavement
6a	Full pavement - complete 36' width
6b	Full pavement - 24' top, 11' travel ways
6c	Millings/asphalt (with chip seal)
6d	Foamed asphalt mix (with double shot)

3. Stabilization Treatment

Stabilization and dust control treatments are all done in conjunction with grading for maximum effectiveness. Stabilization treatments are types of additives which are used to "stabilize" the roadway by application or incorporating the additive in the surface gravel of the roadway to bind dust particles to create a more solid or durable driving surface. These treatments would only be eligible for federal funding if used in conjunction with new crushed surface, otherwise they are considered maintenance and are not eligible for federal funding. Members of the public raised questions about possible health concerns that could result from dust suppression treatments. If any of these types of treatments are selected as an improvement option, there would further investigation of the pros and cons of the various types of treatments.

- ***Bentonite*** – This is naturally occurring clay that binds to the dust particles in gravel roads to reduce dust. It works best with limestone type gravels. Bentonite is added to the roadway aggregate when placed, rather than yearly, and then treated with another dust suppressant for best results. This option would require a new gravel lift to be placed at the same time.
- ***Magnesium Chloride (MgCl)*** – MgCl is the chemical most commonly used by Flathead County and MDT for dust suppression. It is placed once a year in springtime when grading the road. *Calcium chloride (CaCl) is n*ot used often in Montana, but is very similar to MgCl.
- ***Lignin*** – This polymer, derived from wood, can be used to suppress dust by spraying on top, or mixed with the top few inches of road surface to stabilize and thus reduce dust. It is neutral to the environment. Local cost information was not available for Lignin.
- ***Black Oil*** – This asphalt emulsion does not last as long as MgCl, and its price varies greatly with asphalt prices. In 2009, Flathead County estimated it would cost $4,000-8,000 per mile to apply. In 2010, Montana Dust Control Company estimated that it was roughly the same cost to apply as MgCl. Top Seal, originally listed as a separate option, is the same as Black Oil.
- ***EnviroKleen*** – This polymer or resin binder is used to stabilize the road surface. It binds dust particles to prevent them from escaping, and can be used in any temperature. It is three times more expensive than the other treatment options.
- ***RoadOyl*** – This pine resin emulsion is used to stabilize the road surface. Traffic on this treatment will compact the surface into a smooth pavement-like finish. It can react with strong organic oxidizing materials, strong acids and strong bases, and slightly darkens the surface when dry. It is best used where there are a lot of rock, but few fines to bind the road together, but also works well where there are a lot of fines.
- ***SoilSement*** – This acrylic polymer emulsion is used to stabilize the road surface. Applied as a diluted solution, it has residual benefits each year. Applications are designed to last three to six months. It is categorized as environmentally safe, non-toxic, non-corrosive, non-flammable and does not pollute groundwater. It dries clear and is best used anywhere there are a lot of fines to bind the road together.
- ***Dead Wood and Vegetable Oil*** – This was suggested as a creative use of the dead wood along NFFR and the low cost of vegetable oils. This option was not considered as it is not a tested road treatment.
- ***Soybean Oil By-Product*** – This has been used with success in Minnesota. While more expensive than CaCl, it lasts an entire summer and uses sustainable sources. It is environmentally friendly, and should biodegrade in 28 days. The treatment itself remains

effective after the chemical biodegrades. Conflicting information about the applicability to dust control on roadways resulted in elimination of this option from further consideration.

4. Improve Gravel Surfacing

The following three options are considered to still be gravel road surfacing and would be maintained by Flathead County if implemented.

New Gravel Lift *(6 inches)* – A new 26 foot wide gravel lift would improve the roadway surface conditions, such as potholing and wash boarding. Maintenance of the new lift would include grading twice a year on the normal county maintenance schedule.

Double Shot – Two chip seals would be applied on top of the gravel road, which would seal the top to both reduce dust and improve the roadway surface conditions. Reconstruction of the gravel base prior to the first application and grading is recommended to eliminate any soft spots, poor gravel, or other conditions that would reduce the life of the treatment. If the gravel corridor is inspected and determined to be in good condition, the treatment would cost considerably less. Double Shot would be reapplied every 5 years.

Driving Surface Aggregate (DSA) – DSA is an all-rock gravel which has been used with success by WFL in Lava Beds National Monument, California. Advantages include reduced maintenance cycles, no chemicals and reduced dust. Maintenance includes grading, about half as often as a typical gravel road. A pre-paver depth of 8 inches is compacted to either a 4.5 or six inch surface. Surface life is extended with greater compacted depth. Compared to other gravel roads, DSA produces considerably less dust. Dust control treatments can still be applied if desired. Information about DSA is included in Appendix C.

5. Speed Enforcement/Reduction Strategies

Speed Indicator Signs (Solar) – These signs detect and display a vehicle's current speed and flash or give some other indication when the roadway user has exceeded the speed limit. The average lifespan of a solar sign is 10 to 15 years. The signs are mountable on a standard or existing sign post, as well as available in a portable trailer version. Specific locations would need to be studied and identified for appropriate placement of speed indicator signs.

Speed Dips – Speed humps were removed from consideration as they impede snow removal. Speed dips would have to be heavily justified for funding to be found for them. Based on Flathead County policy, speed dips were also removed from further consideration because they impede maintenance on gravel roads, particularly grading.

Narrow the Gravel Roadway – Narrowing the roadway to 24 feet wide would tend to slow down roadway users. The gravel has been reported to reach widths much wider than the originally constructed gravel roadway and users tend to drive faster on wider roads.

Police Car with Dummy – This technique is used in rural Utah with success, particularly in Kane County. A lifelike dummy is placed in a police car, which is parked along the corridor and moved bi-weekly. The dummy costs about $1,800 and the car can be the oldest car in the Sheriff's fleet.

Additional Signage (Safety or Speed Limit) – There is one speed limit sign at the beginning of the gravel section of road to the south (approx RP 12.4), and one at the north end near Camas Road. Additional speed limit signage may assist in reminding drivers of vehicles to slow down, and warning signs may be strategically placed to reduce accidents. Specific locations would need to be studied and identified for appropriate placement of warning signs.

Fund Additional Law Enforcement – There is currently one "dust cop" who covers Flathead County and can ticket vehicles that are speeding and creating excessive dust. An average cost

for another law enforcement officer is approximately $97,000 per year, which includes any benefits and overhead costs for an additional employee (Dupont, 2010).

Education to Reduce Speeds – This option could be similar to educational efforts used by state and local governments to reduce drunk driving or driving without seat belts. Education would not likely reach many of the non-local roadway users, thus the cost/effectiveness ratio is difficult to assess.

6. Bituminous Surface Treatment/Asphalt Concrete Pavement

These improvement options are not additive to the "no-action", which is the normal maintenance (annual grading) that would usually occur. A variety of full roadway surface rehabilitation options were considered. The various options were narrowed down to four options. All options would pave the existing alignment, which was redesigned in 1987 to meet a 40-50 mph design criteria. No realignment would be considered. The geotechnical analysis recommended a preliminary pavement section of 3 inches asphalt surfacing and 3 inches crushed aggregate on top of the existing gravel base. Construction to full pavement (36 foot or 24 foot) options would result in maintenance of the NFFR shifting from county to MDT.

Full Pavement of Corridor, Complete 36 ft Width – This would be a typical commercial-mix pavement, with 12 foot lanes and 6 foot shoulders, and a chip seal on top. The lifespan of the pavement would be 20 years, and maintenance would follow a pavement preservation plan which would typically include crack sealing every 2 years and a chip seal every 5-7 years. MDT typically chip seals a pavement the same year or the year after placement, which drastically reduces raveling and degradation of the road.

Full Pavement of Corridor, 24 ft Width – This is the same as previous options, but would have 11 foot lanes and one foot paved shoulders before the gravel side slopes. This option would decrease the amount of pavement which would need to be maintained, while still reducing dust. The narrower road may also reduce speeds in the same way that narrowing the gravel road might.

Asphalt Millings (with Chip Seal) – This would be asphalt milled from other roadways, placed on the road to 26 feet wide, then compacted and topped with a chip seal, instead of a completely new asphalt pavement. The advantages are that millings can be obtained from any roadway project, because they are state property, which reduces cost. The cost of hauling to MDT stockpile would be covered by the project funds for the project being milled, and so only costs for hauling from the stockpile to the site would be needed. Some disadvantages are that availability is an unknown factor; the NFFR would likely be improved incrementally, which may affect funding.

Foamed Asphalt Mix (with Double Shot) – This is an asphalt pavement which is considered a "warm mix." That means that the plant making the mix runs cooler, thus saving money, and the pavement does not release volatiles into the air when being placed, like typical "hot mix" does. This option was for a 26 foot wide road, with a double-shot on top. Another advantage is that foamed asphalt is easier to compact, so contractors save money on compaction. To-date, warm mix has met all of the MDT specifications. Foamed asphalt warm mix has been used extensively in the Midwest on secondary roads.

Potential Mitigation for Wildlife Impacts

An additional suggestion was to include wildlife crossing structures with each of the paving options to help mitigate vehicle-wildlife crashes. These structures would include off-roadway fencing to direct wildlife towards the crossing. The cost of such structures was not included for these options, due to the lack of wildlife kill data and difficulty quantifying where and how many structures would be needed. A single structure would likely cost on the order of $500,000.

Placing structures as far apart as a mile could add up to $13 million to any projected costs, which could be cost-prohibitive.

4.3 Cost Comparison

A cost comparison for the improvement options was made based on a horizon cost of 20 years. Twenty years was selected, as options such as full pavement of a roadway has a usable life of 20 to 30 years. Other options such as Magnesium Chloride must be re-applied seasonally. Table 4.2 lists these cost estimates.

Table 4.2 – Estimated Costs

Treatment	Initial Cost	Maintenance Cost per year of life	Maintenance Frequency	20-year Lifecycle Cost (in 2010 dollars)	Notes
No-Action (current)	$ -	$ 101,900	2x / yr	$ 2,037,000	this price only includes grading + MgCl applications
Maintenance					
Grading	$ 29,100	$ 29,100	4x / yr	$ 582,000	Maintenance is approx. $7,275 per grading event
Guardrail installation	$ 96,300	$ 10,000	ongoing	$ 296,300	Total maintenance cost varies widely
Stabilization Treatments (+ 1 Grading)					
Bentonite	$ 78,600	$ 78,600	1x/yr	$ 1,862,400	Applied once in conjunction with a new gravel lift
Magnesium chloride	$ 87,300	$ 87,300	1x/yr	$ 2,037,000	
Calcium chloride	$ 87,300	$ 87,300	1x/yr	$ 2,037,000	MgCl more effective than CaCl, approx. same price
Lignin	$ -	$ -	1x/yr	$ 291,000	Unable to obtain a local cost estimate
Black oil	$ 87,300	$ 87,300	1x/yr	$ 2,037,000	
EnviroKleen	$ 460,900	$ 460,900	1x/yr	$ 9,509,900	Can apply in freezing temps, otherwise the same as RoadOyl
RoadOyl	$ 165,900	$ 165,900	1x/yr	$ 3,609,800	Better than SoilSement for roads with very few fine particles
SoilSement	$ 165,900	$ 165,900	1x/yr	$ 3,609,800	
Soybean Byproduct (MN DOT used this)	$ 239,700	$ 239,700	1x/yr?	$ 5,084,800	Some conflicting information about applicability & frequency
Improve Gravel Surfacing					
New 6" gravel lift	$ 1,229,200	$ 14,600	2x / yr	$ 1,520,200	26 ft top
Double Shot (2 chip seals) [1]	$ 5,592,800	$ 71,000	5 yrs	$ 7,013,200	Reapplication of double shot every 5 years
Driving Surface Aggregate (DSA)	$ 529,100	$ 7,300	1x/yr or less	$ 674,600	Haul distance will increase costs slightly
Speed Reduction Strategies					
Speed indicator signs (solar)	$ 30,000	$ 30,000	10 yrs+	$ 60,000	Lifespan approx. 15 years if well maintained
Speed dips	$ -	$ -	0	$ -	County policy not to install speed dips
Narrow the gravel roadway to 24 ft	$ 150,500	$ 9,700	2x / yr	$ 344,500	
Police car with dummy	$ 7,800	$ 6,000	bimonthly+	$ 127,800	Includes moving car bimonthly, cycling to a new car each year
Additional signage (safety or speed limit)	$ 1,300	$ 1,300	10 yrs+	$ 3,900	Replace signs every 10 yrs (or more)
Fund additional law enforcement	$ 97,000	$ 97,000	1 yr	$ 1,940,000	Includes benefits and overhead costs
Education to Reduce Speeds	$ 50,000	$ 50,000	ongoing	$ 1,000,000	Estimated cost of ongoing educational effort
Bituminous Surface Treatment/ Asphalt Concrete Pavement [1]					
Full pavement, complete 36' width	$ 15,241,900	$ 221,300	2-5 yrs	$ 19,666,900	
Full pavement, 24' top, 11' travel ways	$ 10,161,300	$ 106,500	2-5 yrs	$ 12,291,800	
Millings/asphalt (with chip seal)	$ 5,268,000	$ 106,500	2-5 yrs	$ 7,398,600	Haul costs and incremental availability will greatly affect costs. This estimated price includes no haul costs.
Foamed asphalt mix (with Double Shot)	$ 7,254,000	$ 106,500	2-5 yrs	$ 9,384,600	

[1] Assumed all BST options reconstructed to gravel to account for potentially poor base course

Note: The above improvement options do not account for any mitigation costs, wildlife or any other potential mitigation requirement costs. Also, options from Maintenance to Speed Reduction Strategies would need to be added to the "No-action" cost to truly illustrate the total possible expenditures.

4.4 Screening Matrix

Screening Criteria

A draft version of the screening matrix was considered at the the initial improvement option meeting on June 3, 2010. The following criteria were either removed or modified as described below.

Public Support – Support of options is anticipated to be very divided, and thus difficult to quantify whether the option is "supported" or not. Public support was removed from the screening matrix criteria to be more equitable to all those that have expressed issues and concerns about the roadway. This acknowledges that there is equally strong support on both sides of the issues and concerns.

Improves Safety of Roadway – This was changed to a yes/no criteria, because either the proposed improvement to the roadway will improve the safety of the roadway, or it will not.

Agrees with Land Use and Management Plans – MDT is not in the position of managing or implementing land planning. These issues need to be addressed by local, county, USFS, and National Park Service land use plans. The group suggested that this criteria could be addressed as secondary or higher criteria for those improvement options that are advanced. The criterion was included in the matrix for alternatives for the purpose of aiding future alternative development of any improvement option.

Jeopardy Biological Opinion – The 1980's USFWS Section 7 Jeopardy biological opinion determining that a federal action is likely to jeopardize the continued existence of a listed species in the wild by reducing the reproduction, numbers, or distribution of the species was not included. The issues of possible growth inducement and/or cumulative impacts relative to each improvement option were questioned. This criterion was not included at this level of the study, but reflected in the "Impact to Wildlife" rating.

Based on these changes to the initial screening matrix a secondary, more in-depth screening matrix was prepared.

Additional Screening Criteria

During the June 3 meeting, each improvement option in the matrix was reviewed by the group to determine if it was placed in the correct group. Any changes suggested by the group were incorporated by the consultant and sent out for further review by the meeting participants.

Improvement options were assigned yes/no values when an impact would yield a discreet result on the criteria. The group assigned low, medium and high quantifiers for screening criteria that were best described with varying assigned levels. There was a request to define stabilization treatment options, and to add the duration of life and the cost per lineal foot. The group was then given the opportunity to review the updated matrix. The subsequent iterations of the matrix were reviewed several times, and the final matrix is shown in Table 4.3.

Table 4.3 – Final Screening Matrix

Option		Screening Criteria								Outcome
No.	Description	Helps with dust control (Y/N)	Estimated Cost - 20 Year (L/M/H)	Impact to Environment (L/M/H)	Impact to Wildlife (L/M/H)	Potential to increase vehicle speeds (Y/N)	Improves Roadway Safety (Y/N)	Potential to Increase Traffic (Y/N)	Agrees with Land Use & Management Plans (Y/N)	Advance for further consideration? (Y/N)
1	**No-action**	N	L	L	L	N	N	N	Y	**Y**
2	**Maintenance**									
2a	Additional Grading of Current Road	N	L	L	L	N	Y	N	Y	**Y**
2b	Guardrail installation	N	L	L	L	N	Y	N	Y	**N**
3	**Stabilization Treatment** [1]									
3a	Bentonite	Y	M	M	M	Y	Y	N	Y	**Y**
3b	Magnesium chloride/ calcium chloride	Y	M	M	M	Y	Y	N	Y	**Y**
3c	Lignin	Y	M	L	L	Y	Y	N	Y	**Y**
3d	Black oil	Y	M	M	M	Y	Y	N	Y	**N**
3e	EnviroKleen	Y	M	unknown	unknown	Y	Y	N	Y	**N**
3f	RoadOyl	Y	M	unknown	unknown	Y	Y	N	Y	**Y**
3g	SoilSement	Y	M	M	M	Y	Y	N	Y	**Y**
3h	Dead wood and vegetable oil	N	M	L	L	Y	Y	N	?	**N**
3i	Soybean Oil Byproduct	Y	M	L	L	N	Y	N	Y	**N**
4	**Improve Gravel Surfacing**									
4a	New gravel lift	N	M	L	L	Y	Y	N	Y	**N**
4b	Double Shot/Bitumen	Y	M	L	L	Y	Y	N	Y	**N**
4c	Driving Surface Aggregate (DSA)	Y	M	L [2]	L	Y	Y	N	Y	**Y**
5	**Speed enforcement/reduction strategies**									
5a	Speed indicator signs (solar)	Y	L	L	L	N	Y	N	Y	**Y**
5b	Speed dips	Y	L	L	L	N	Y	N	Y	**N**
5c	Narrow the gravel roadway	Y	M	L	L	N	Y	N	Y	**N**
5d	Police car with dummy	Y	L	L	L	N	Y	N	Y	**Y**
5e	Additional signage (safety or speed limit)	Y	L	L	L	N	Y	N	Y	**Y**
5f	Fund add'l law enforcement	Y	M	L	L	N	Y	N	Y	**Y**
5g	Educational Effort to Reduce Speeds	Y	M	L	L	N	Y	N	Y	**Y**
6	**Bituminous Surface Treatment/Asphalt Concrete Pavement**									
6a	Full pavement - complete 36' width	Y	H	H	H	Y	Y	Y	N	**N**
6b	Full pavement - 24' top, 11' travel ways	Y	H	H	H	Y	Y	Y	N	**Y**
6c	Millings/asphalt (with chip seal)	Y	M	M	M	Y	Y	Y	N	**Y**
6d	Foamed asphalt mix (with double shot)	Y	H	M	M	Y	Y	Y	N	**Y**

1 - Stabilization treatments are all done in conjunction with grading for maximum effectiveness.

2 - Will have less dust and sediment than existing condition, but still will have some impacts.

Additional improvement options were added to the screening matrix during the month of June. The new improvement options were analyzed using the same screening criteria as the original list of options and a cost estimate was made for all of the options. Due to limited funding mechanisms and source for implementation of the possible improvement options (see Funding Sources section below), many options were not advanced for further consideration. The final version of the matrix table is shown in Table 4.4.

In addition to the general terrestrial wildlife category for the screening criteria, the USFS asked the study document consider any effects to aquatic species. On separate projects, the public has expressed concern to USFS regarding the potential impact of roadway dust on aquatic habitat. Roadway sediment can be transported directly to streams through water run-off or movement by wind.

As the full list of options were reviewed again by the team, many of the options were eliminated based on the screening criteria. The review of the final version of the screening matrix and cost estimate resulted in the study team recommending the improvement options for further consideration shown in Table 4.4.

Table 4.4 – Improvement Options Advanced For Further Consideration

Improvement Option		Advance for Further Consideration?
1	**No-action**	**Yes**
2	**Maintenance**	
2a	Additional Grading of Current Road	**Yes**
3	**Stabilization Treatments**	
3a	Bentonite	**Yes**
3b	Magnesium Chloride/ Calcium Chloride	**Yes**
3c	Lignin	**Yes**
3f	RoadOyl	**Yes**
3g	SoilSement	**Yes**
4	**Improve Gravel Surfacing**	
4c	Driving Surface Aggregate (DSA)	**Yes**
5	**Speed Enforcement/Reduction Strategies**	
5a	Speed Indicator Signs (Solar)	**Yes**
5d	Police Car with Dummy	**Yes**
5e	Additional Signage (Safety or Speed Limit)	**Yes**
5f	Fund Additional Law Enforcement	**Yes**
5g	Educational Effort to Reduce Speeds	**Yes**
6	**Bituminous Surface Treatment/Asphalt Concrete Pavement**	
6b	Full Pavement - 24' Top, 11' Travel Ways	**Yes**
6c	Millings/Asphalt (with Chip Seal)	**Yes**
6d	Foamed Asphalt Mix (with Double Shot)	**Yes**

If any of the improvement options are implemented in the future, a more thorough environmental screen could include effects to the watershed. There may also be concerns about any oil or chemical applications that have potential to be transported by water into the North Fork of the

Flathead River and contribute additional cumulative effects to water quality in downstream aquifers or to Flathead Lake.

(Table 4.4 was updated after the July 27, 2010 public meeting. Based on input received, improvement option 3a Bentonite was added back in as an improvement option for future consideration)

4.5 Funding

General Discussion

Surface treatments such as magnesium chloride/calcium chloride are considered maintenance and are not typically eligible for federal funding. Other possible funding sources to be explored include:

- Rural Improvement District funds
- Polebridge toll and/or tax for all roadway users between Columbia Falls and Polebridge
- Parking lot/fee area for recreational users/rafting outfitters
- Flathead National Forest/USFS cost share/funding

The study team explored options for other possible funding sources. Flathead County has not created a Rural Special Improvement District (RSID) within the corridor study area. Typically the Flathead County RSID is used for one-half to 2 mile stretches of roadways that land owners along the roadway agree to fund using tax revenue. The county has mechanisms in place to create an RSID. The land owners adjacent to the NFFR would be responsible to initiate the process and ask the Flathead County Commissioners to approve the district, however, the creation of boundaries for the corridor study area would make this funding mechanism very complicated (Prunty, 2010).

Another possible funding option suggested was the possibility of a toll road. However, the state does not allow toll roads without legislative action, and such legislation is not likely to be supported by locals.

Assessing parking lot fees raised concerns that users, whether local or recreational, would bypass the fee by parking along the shoulder of the gravel roadway in various locations up and down the corridor. This behavior would decrease the safety of the road, and was determined to not be in the best interests of roadway users.

There is no authority or mechanism for the USFS to utilize cost-share or contributed funds on improvement of a county road. Funding mechanisms that include USFS cost-sharing were therefore eliminated from consideration. The FHWA and WFLA funding eligibility was considered early in the improvement options evaluation; clarification specific to USFS funding questions were obtained later in the process.

While there are many potential funding sources, this corridor has limited options for funding. Reasons include: no identified safety problems, no eligible bridges, public opposition, limited growth/development potential, and the general unlikelihood of these sources being available. Some funding is only available for specific types of proposed projects. These sources are described below.

Local Funding Sources

General Fund –This fund provides revenue for most major county functions such as administration of local government and the departments of public services; including police, fire, and parks. Revenues for the fund are generated through the general fund mill levy on real and

personal property and motor vehicles; licenses and permits; state and federal intergovernmental revenues; intergovernmental fund transfers; and charges for services.

Many transportation-related services are supported by this fund, including public services. The Flathead County Road and Bridge departments are responsible for maintaining Flathead County roads including pavement repair, striping, signing, lighting and traffic signal maintenance, and plowing and sanding during the winter. In addition to revenue from the General Fund, a portion is generated from gas tax funds and road maintenance funds. The sheriff's department is responsible for enforcing traffic laws on the Flathead County roadways.

Road Fund – Under 15-70-101, MCA, Montana assesses a tax of $.27 per gallon on gasoline and diesel fuel used for transportation purposes. The County Road Fund provides for the construction, reconstruction, maintenance, and repair of rural roads outside the corporate limits of cities and towns in Flathead County. Revenue for this fund comes from intergovernmental transfers (i.e. state gas tax apportionment and motor vehicle taxes), and a mill levy assessed against county residents living outside cities and towns.

For state fiscal year 2011, Flathead County's allocation is approximately $473,400 in state fuel tax funds. The amount varies annually, but the current level provides a reasonable base for projection throughout the planning period.

Special Revenue Funds – Special revenue funds may be used by the county to budget and distribute revenues legally restricted to a specific purpose. Several such funds that benefit the transportation system are discussed briefly below.

- ***Capital Improvements Fund*** – This fund is used to finance major capital improvements to county infrastructure. Revenues are generated by loans from other county funds, and must be repaid within ten years. Major road construction projects are eligible for this type of financing.
- ***Rural Improvement District (RID) Revolving Fund*** – This fund is used to administer and distribute monies for specified RID projects. Revenue for this fund is generated primarily through a mill levy and through motor vehicle taxes and fees. A mill levy is assessed only when delinquent bond payments dictate such an action. These funds are placed in a trust account for specific projects. This funding source would not be available for county funding of any roadway improvements on the NFFR (Prunty, 2010).
- ***Special Bond Funds*** – A fund of this type may be established by the county on an as-needed basis for a particularly expensive project. The voters must approve authorization for a special bond fund. The county is not currently using this mechanism.

<u>Private Funding Sources and Alternatives</u>

Private financing of highway improvements, in the form of right of way donations and cash contributions, has been successful for many years. In recent years, the private sector has recognized that better access and improved facilities can be profitable due to increases in land values and commercial development possibilities. Several forms of private financing for transportation improvements used in other parts of the United States are described in this section.

Development Financing – The developer provides the land for a transportation project and in return, local government provides the capital, construction, and necessary traffic control. Such a financing measure can be made voluntary or mandatory for developers.

Cost Sharing – The private sector pays some of the operating and capital costs for constructing transportation facilities required by development actions.

Transportation Corporations – These private entities are non profit, tax exempt organizations under the control of state or local government. They are created to stimulate private financing of highway improvements.

Road Districts – These are areas created by a petition of affected landowners, which allow for the issuance of bonds for financing local transportation projects.

Private Donations – The private donation of money, property, or services to mitigate identified development impacts is the most common type of private transportation funding. Private donations are very effective in areas where financial conditions do not permit a local government to implement a transportation improvement itself.

General Obligation (G.O.) Bonds – The sale of general obligation bonds could be used to finance a specific set of major highway improvements. A G.O. bond sale, subject to voter approval, would provide the financing initially required for major improvements to the transportation system. The advantage of this funding method is that when the bond is retired, the obligation of the taxpaying public is also retired. State statutes limiting the level of bonded indebtedness for cities and counties restrict the use of G.O. bonds. The present property tax situation in Montana, and recent adverse citizen responses to proposed tax increases by local government, would suggest that the public may not be receptive to the use of this funding alternative.

Development Exactions/Impact Fees – Impact Fees are increasingly being considered as a potential method for financing infrastructure needs. Presently, the only communities utilizing impact fees are the City of Bozeman, the City of Missoula, and Gallatin County. Developer exactions and fees allow growth to pay for itself. The developers of new properties should be required to provide at least a portion of the added transportation system capacity necessitated by their development, or to make some cash contribution to the agency responsible for implementing the needed system improvements.

Establishment of an equitable fee structure would be required to assess developers based upon the level of impact to the transportation system expected from each project. Such a fee structure could be based upon the number of additional vehicle trips generated, or upon a fundamental measure such as square footage of floor space. Once the mechanism is in place, all new development would be reviewed by the local government and fees assessed accordingly.

Tax Increment Financing (TIF) – Increment financing has been used in many municipalities to generate revenue for public improvement projects. As improvements are made within the district, and as property values increase, the incremental increases in property tax revenue are earmarked for this fund. The fund is then used for improvements within the district. Expenditures of revenue generated by this method are subject to certain spending restrictions and must be spent within the district. Tax increment districts could be established to accomplish transportation improvements in other areas of the community where property values may be expected to increase.

Multi Jurisdictional Service District – This funding option was authorized in 1985 by the State Legislature. This procedure requires the establishment of a special district, somewhat like an SID or RSID, which has the flexibility to extend across city and county boundaries. Through this mechanism, an urban transportation district could be established to fund a specific highway improvement that crosses municipal boundaries (e.g., corporate limits, urban limits, or county line). This type of fund is structured similar to an SID with bonds backed by local government issued to cover the cost of a proposed improvement. Revenue to pay for the bonds would be raised through assessments against property owners in the service district.

Local Improvement District – This funding option is only applicable to counties wishing to establish a local improvement district for road improvements. While similar to an RSID, this funding option has the benefit of allowing counties to initiate a local improvement district through a more streamlined process than that associated with the development of an RSID.

Federal Funding Sources

As part of the state-designated Secondary Highway System the most prevalent source of funding for improvements along the NFFR is Surface Transportation Program – Secondary (STPS) funds.

Secondary Highway System (STPS) – The federal and state funds available under this program are used to finance transportation projects on the state-designated Secondary Highway System. The Secondary Highway System is defined under 60-2-125, MCA as those highways that have been functionally classified by the MDT as either minor arterials or major collectors. These highways have been selected by the Montana Transportation Commission in cooperation with the county commissioners to be placed on the secondary highway system. Of the total received, 86.58% is federal and 13.42% is state funds from the State Special Revenue Account. Eligible activities include reconstruction, rehabilitation, and miscellaneous improvements.

However, there are currently no federal funds obligated to this corridor study area from any federal or state source. This roadway is not currently on the priority list of projects in the Missoula District for the Secondary Roads Program - Capital Construction Program.

If this roadway is prioritized in the future then there is potential for use of secondary funds that are distributed state-wide (MCA 60-3-206) to each of the five financial districts, based on a formula which takes into account the land area, population, road mileage and bridge square footage. For the total funds available, a minimum of 65 percent are allocated for capital construction projects. The remainder of the funds may be used by MDT for secondary highway system pavement preservation. MDT and county commissions determine Secondary capital construction priorities for each district with final project approval by the Montana Transportation Commission. By state law the individual counties in a district and the state vote on Secondary funding priorities presented to the Montana Transportation Commission. The Counties and MDT take the input from citizens, small cities, and tribal governments during the selection process. Projects are led through a competitive bidding process.

Public Lands Highways (PLH)

Discretionary – The PLH Discretionary Program provides funding for projects on highways that are within, adjacent to, or provide access to federal public lands. As a discretionary program, the project selection authority rests with the Secretary of Transportation. However, this program has been earmarked by Congress under SAFETEA-LU. There are no matching fund requirements.

Forest Highway – The Forest Highway Program provides funding to projects on routes that have been officially designated as Forest Highways. Projects are selected through a cooperative process involving FHWA, the USFS and MDT. Projects are developed by FHWA's Western Federal Lands Office. There are no matching fund requirements.

On-System Highway Bridge Replacement and Rehabilitation Program (HBRRP) – HBRRP funds are federally apportioned to Montana and allocated to two programs by the Montana Transportation Commission, On System and Off System Bridge programs. Projects eligible for funding under the On-System program include all highway bridges on the state system. In general, projects are funded with 86.58 percent federal funds and 13.42 percent state funds. The bridges are eligible for rehabilitation or replacement.

In addition, painting and seismic retrofitting are also eligible under this program. MDT's Bridge Bureau assigns a priority for replacement or rehabilitation of structurally deficient and functionally obsolete structures based upon sufficiency ratings assigned to each bridge. The Montana Transportation Commission approves projects which are awarded through a competitive bidding process.

The only bridge on this study corridor crosses Big Creek at RP 20.15. According to MDT's Bridge Management System the structure is in good condition with a sufficiency rating of 91.1. Because this bridge is owned and maintained by the USFS and is in good condition, it is not a priority or eligible for funding through this program.

Highway Safety Improvement Program (HSIP) – HSIP is a new core funding program established by SAFETEA-LU. HSIP funds are federally apportioned to Montana and allocated to safety improvement projects identified in the strategic highway safety improvement plan by the Montana Transportation Commission. Projects described in the state strategic highway safety plan must correct or improve hazardous road location or feature, or address a highway safety problem. The Montana Transportation Commission approves and awards the projects which are awarded through a competitive bidding process. Generally, the federal share for the HSIP projects is 90% and the state is responsible for 10 percent. Funding priorities for this program are identified by MDT Safety Management Section.

There are two programs that receive HSIP funding: the Highway – Rail Crossing Program, which is not a consideration for the NFFR since there are no rail crossings along this corridor and the High Risk Rural Roads Program.

High Risk Rural Roads Program (HRRRP) – Funds are set aside from the Highway Safety Improvement Program funds apportioned to Montana for construction and operational improvements on high-risk rural roads. These funds are allocated to HRRRP projects by the Commission. If Montana certifies that it has met all of the needs on high risk rural roads, these set aside funds may be used on any safety improvement project under the HSIP. Montana's set aside requirement for HRRRP is approximately $700,000 per year. Availability of funds through this program for the NFFR is limited due to other projects already prioritized within this program.

State Funding Sources

State Funded Construction (SFC) – The State Funded Construction Program is limited, and is funded entirely with state funds from the Highway State Special Revenue Account. It provides funding for projects that are not eligible for federal funds.

This program funds projects to preserve the condition and extend the service life of highways. Funding through this program is limited and consequently typically used on highways maintained by the state.

Other Funding Sources – Other sources of funding may be available in addition to those listed. Funds would need to be pursued by local entities.

Funding Conclusion

The analysis of funding opportunities indicates that the citizens of Flathead County must work with officials at the county to prioritize any improvements they desire, whether for the corridor study area of the NFFR, or for other roadways in the county. Once improvements are prioritized, then funding can be identified and then potential improvements in the form of projects can be considered. MDT and Flathead County, along with USFS, WFL and FHWA can all work together to determine what, if any improvement options can be implemented for the NFFR corridor study area in the future.

5.0 NFFR Corridor Study Conclusion

This pre-NEPA/MEPA corridor study was undertaken at the request of Flathead County. Over the years, the county has received numerous requests from residents seeking a mechanism to make improvements along the gravel section of the roadway. This 13-mile section between Camas Road and Blankenship Road is currently under the county's jurisdiction and was previously evaluated for full reconstruction and pavement by Western Federal Lands in the 1980s. However, due to public opposition, the project was dropped and the funds were used on Big Mountain Road. The intent of this study was to gather information from the public to identify possible improvement options and consensus, if any, to improve driving conditions and the surrounding environment.

A screening matrix compared costs along with social and environmental outcomes and was used to limit the total number of improvement options that were forwarded into the Draft Corridor Study for public review. Members of the public were very unequivocal and resolved about improvement options they preferred.

The public perspective gained through public involvement efforts found no consensus based on the conflicting comments received. This resulted in no single option or group of improvement options emerging as a recommended priority for this corridor. Based on engineering and environmental perspective, several of the improvement options presented in Section 4 of the corridor study are viable and have been implemented in similar sensitive areas in other parts of the country and in Montana. Dust and maintenance issues continue to be a serious problem along this roadway and over the years, incremental development and tourism may have led to higher traffic volumes. Regardless of the public's division concerning improvement options, some form of dust abatement measures appear to be necessary.

During the course of the study, many members of the public stated that if they could not have their preferred option (for instance either "pave" or "no-pave"), their preference would be to have better maintenance and, if at all possible, one of the dust abatement treatments identified in the corridor study. Property owners along the corridor and other area residents using the corridor will need to continue to work with Flathead County officials to identify and prioritize funding sources for dust abatement or any of the other identified improvement options.

The next steps for management and/or improvements to this segment of roadway will be determined by Flathead County. This study provides a diverse list of improvement options and management strategies that may be considered. If any option demonstrates public buy-in, is selected and funding is prioritized for that option, a project implementation process would begin, including any required environmental process.

References

Cambridge Systematics, Inc., 2009. Montana Business Process to Link Planning Studies and NEPA/MEPA Reviews, Final Report. Accessed at: http://www.mdt.mt.gov/publications/docs/brochures/corridor_study_process.pdf

Cooper, S. V., J. Greenlee and C. Jean. 2000. Ecologically significant wetlands in the North Fork Flathead River watershed. Report to the Montana Department of Environmental Quality. Montana Natural Heritage Program, Helena. 31 pp. plus appendices.

Craver, 2010. Personal Communication, Craver, Karin and PB Americas, June 2010.

Deleray, M. 2010. Fisheries Biologist, Montana Fish Wildlife and Parks. March and April, 2010, emails and personal communication.

Dupont, J. 2010. Personal conversation between Flathead County and PB Americas, June 2010.

Edmonds, A., J. Giersch, S. Gehman, P. Lundberg, J. Tabbert and B. Robinson. 2003. Winter Snow Tracking Surveys for Lynx and Other Forest Carnivores in the North and Middle Forks of the Flathead River System – Glacier National Park and Flathead National Forest. Wild Things Unlimited.

Edmonds, A., M. Hahr, S. Gehman and B. Robinson. 2002. Forest Carnivore Surveys in the North Fork of the Flathead Valley, Northwest Montana. Wild Things Unlimited.

Foresman, K.R. 2001. The Wild Mammals of Montana. Special Publication 12, The American Society of Mammalogists. Lawrence, Kansas: Allen Press.

Graves, T. 2010. Wildlife Biologist, USGS, Northern Rocky Mountain Science Center. Jan. – Mar., 2010 emails, telephone conversations and personal communication.

Hagemeier, A. 2010. Personal communication between Flathead County and P.B. Americas, Inc.

Kuennen, R. 2010. Wildlife Biologist, Flathead National Forest, Glacierview Ranger District. Mar. – Apr., 2010. Telephone conversations and emails.

Maxell, B., J.K. Werner, P. Hendricks, D. Flath. 2003. *Northwest Fauna 5 Herpetology in Montana: A History, Status Summary, Checklists, Dichotomous Keys, Accounts for Native, Potentially Native and Exotic Species, and Indexed Bibliography.* Published by the Society for Northwestern Vertebrate Biology. 138pp
.

Montana Department of Environmental Quality. 2004. Water Quality Assessment and TMDLs for the Flathead River Headwaters Planning Area, Montana. http://www.deq.state.mt.us/wqinfo/tmdl/FlatheadHeadwatersFinal/Flathead%20River%20Headwaters%20TMDL%20-%20Full%20Document%20Low-Res.pdf

Montana Fisheries Information System. 2010. Internet data search for fisheries information in the vicinity of the North Fork Road Corridor Study area. Helena, MT.

Montana Natural Heritage Program. 2010. Data search for sensitive species occurrences in the vicinity of the North Fork Road Corridor Study area. Helena, Montana.

MT Census, 2009. http://www.ceic.mt.gov/Demog/estimate/pop/County/CO-EST2009-01-30.htm

Nature Serve, 2006. Standardized Ranking System to denote global and state status. Internet data search. Missoula, MT.

NPA, 2030. NPA Data Services, Inc.
http://www.kalispell.com/downloads/Population%20and%20Population%20Characteristics.pdf

Prunty, D. 2010. Personal communication between Flathead County and PB Americas, June 25, 2010.

Servheen, C. 2010. Grizzly Bear Recovery Coordinator, U.S. Fish and Wildlife Service. April, 2010. Telephone conversations and email. 35

Sirucek, D., D. Yashan, R. Ray, R. Steg. 2003. Waterhsed Restoration Plan for Big Creek, North Fork of the Flathead River. Montana Department of Environmental Quality. Internet source: www.deq.mt.gov/.../TMDL/BigCreekColumbia/BigCreekTMDLCBFinal.pdf

Thomas, J.W., and J. Ruggiero. 1998. Politics and the Columbia Basin Assessment—Learning from the past and moving to the future. *Public Land & Resources Law Review* 19, 33–50.

U.S. Census. 1990. Information on the Census can be located on-line:
http://factfinder.census.gov/servlet/QTTable?_bm=n&_lang=en&qr_name=DEC_1990_STF1_DP1&ds_name=DEC_1990_STF1_&geo_id=05000US30029
U.S. Fish and Wildlife Service. 1980. Biological Opinion, On the Effects of the North Fork Flathead Road Improvement. Lakewood, Colorado.

U.S. Fish and Wildlife Service. 1982. Biological Opinion, Re-initiation of formal consultation on the effects of the North Fork Road Improvement (FH-61). Billings, MT.

U.S. Fish and Wildlife Service. 2000. Determination of Threatened Status for the Contiguous U.S. Distinct Population Segment of the Canada Lynx and Related Rule; Final Rule, Federal Register / Vol. 65, No. 58 / Friday, March 24, 2000 / Rules and Regulations; pp 16052 – 16086.

U.S. Fish and Wildlife Service. 2010. ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES MONTANA COUNTIES* .Endangered Species Act.March 2010. Internet Source:
http://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species/countylist.pdf

Ward, T. 2008. The North Fork Road Ambient Particulate Matter Research Study. University of Montana, Missoula, Montana, USA.

Weaver 1994, Singleton 1995, Boyd-Heger 1997. The Transboundry Flathead: A Critical Landscape for Carnivores in the Rocky Mountains. WCS Working Papers No. 18, July 2001. Available for download from http://www.wcs.org/science

Weaver, 2001. John L. Weber. The Transboundry Flathead: A Critical Landscape for Carnivores

in the Rocky Mountains. WCS Working Papers No. 18, July 2001. Available for download from http://www.wcs.org/science

Williams, J. 2010. Wildlife Biologist, R1 Wildlife Program Mgr., Montana Fish Wildlife and Parks. April, 2010. Telephone conversations and email.

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