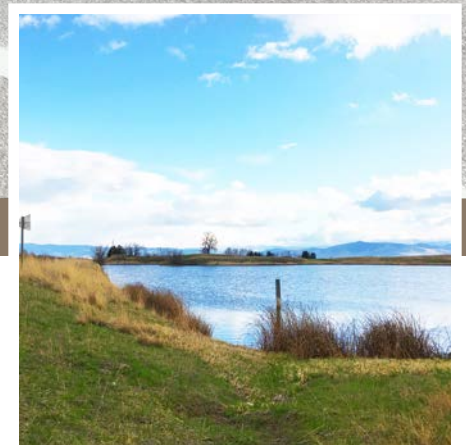
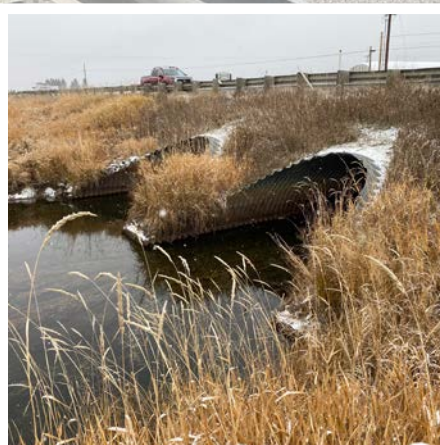


NINEPIPE CORRIDOR



FEASIBILITY STUDY



Prepared by:
**ROBERT PECCIA
AND ASSOCIATES**



Prepared for:
**MONTANA DEPARTMENT
OF TRANSPORTATION**



In coordination with:
**THE CONFEDERATED SALISH
AND KOOTENAI TRIBES**



**FEDERAL HIGHWAY
ADMINISTRATION**

MARCH 15, 2023

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- Appendix 5: Screening Report

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Advisory Committee

Montana Department of Transportation

Vicki Crnich – Planning
Parker Osterloh – Planning
Katie Potts – Planning
Ben Nunnallee – Missoula District
John Schmidt – Missoula District
Jacquelyn Smith – Missoula District
Bob Vosen – Missoula District
Stan Brelin – Traffic and Safety
Joe Zody – Traffic and Safety
Bret Boundy – Geotechnical
Andy Cullison – Bridge
DeWayne Wilson – Bridge
Jon Rainwater – Hydraulics
Jon Axline – Environmental Services
Rebecca Ridenour – Environmental Services
Grant Rodway – Environmental Services
Joe Weigand – Environmental Services
Ryan Wendel – Environmental Services
Miki Lloyd – Consultant Design
Mark Studt – Consultant Design

Confederated Salish and Kootenai Tribes

Melinda Charlo – Indian Preference Coordinator
Scott Johnston – Roads Program Manager
Kari Kingery – Wildlife Biologist
Blair Libby – Wetlands Coordinator
Chauncey Means – Water Quality Administrator
Whisper Means – Wildlife Program Manager

Federal Highway Administration

Ryan Hammon – Statewide and Urban Planner
Gene Kaufman – Operations Engineer

Resource Agencies

Confederated Salish and Kootenai Tribes

Payton Adams
 Kevin Askan
 Michael Durglo
 Tabitha Espinoza
 Vernon Finley
 Rich Janssen
 Kayla Johnson
 Scott Johnston
 Willie Keenan
 Kari Kingery
 Kathryn (Katie) McDonald
 Chauncey Means
 Whisper Means
 Mary Rose Morigeau
 Craig Pablo
 Evan Smith
 Art Soukkala



Montana Department of Environmental Quality

Stephen Carpenedo
 Keenan Storrar



Montana Fish, Wildlife and Parks

Neil Anderson
 Cecily Costello
 John Grant
 Franz Ingelfinger
 Rick Northrup
 Lori Roberts



US Army Corps of Engineers

Jerin Borrego
 Christina Schroeder



US Army Corps
 of Engineers®

US Fish and Wildlife Service

Jodi Clark
 Amy Coffman
 Hilary Cooley
 Jennifer Fortin-Noreus
 Amy Lisk
 Mike McGrath



Cultural Tour Participants

Kootenai Culture Committee:

Vernon Finley (Director)
Francis Auld
Louis Caye Junior
Naida Lefthand
Laurence Kenmille
Levi Hewankorn
Chrissy Ewing
Leonard Michel
Peter Sam Nicolai
Diane Michel
Tom Antiste

Séliš-Qłispé Culture Committee:

Tony Incashola (Director)
Mary Jane Charlo
Rita Adams
Shirley Trahan

Tribal Preservation Office:

Katie McDonald (Officer)
Kevin Askan

Consultant Team

This plan was developed by consulting firms Robert Peccia and Associates (RPA), SK Geotechnical, Herrera, and Ethnotech. The following team members were contributors to the plan:



Robert Peccia and Associates:

Scott Randall, PE, PTOE – *Project Manager*
Sarah Nicolai, PE, PTP – *Deputy Project Manager*
Kerry Lynch, PE, RSP1 – *Transportation Planner*
Brad Thompson, PE – *Senior Transportation Engineer*
Chris Hardan, PE – *Senior Bridge Engineer*
Hailee Cross, EI – *Engineering Technician*



SK Geotechnical:

Cory Rice – *Senior Geotechnical Engineer*
Brett Warren – *Geotechnical Engineer*



Herrera:

Sue Wall – *Senior Wetland Scientist*



Ethnotech:

Dave Schwab – *Senior Archaeologist*
Alex Schwab – *Archaeologist*

ABBREVIATIONS/ACRONYMS

AC	Advisory Committee
ALCO	Aquatic Lands Conservation Ordinance
BCR	Benefit Cost Ratio
cfs	cubic feet per second
CWA	Clean Water Act
DNRC	Department of Natural Resources and Conservation
EO	Executive Order
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FIIP	Flathead Indian Irrigation Project
IBA	Important Bird Area
KCC	Kootenai Culture Committee
LOS	Level of Service
MDEQ	Montana Department of Environmental Quality
MFWP	Montana Fish, Wildlife and Parks
MOA	Memorandum of Agreement
NCDE	Northern Continental Divide Ecosystem
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHS	National Highway System
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
PDO	Property Damage Only
ROD	Record of Decision
RP	Reference Post
SHPO	State Historic Preservation Office
SIAP	System Impact Action Process
SQCC	Séliš-Q̓lispé Culture Committee
SUP	Shared Use Path
TPO	Tribal Preservation Office
USACE	US Army Corps of Engineers
USFWS	US Fish and Wildlife Service
vpd	vehicles per day
WMA	Wildlife Management Area
WMAM	Montana Wetland Assessment Method
WOTUS	Waters of the United States
WPA	Waterfowl Production Area
WVC	Wildlife Vehicle Collision



ES



Source: Ninepipes Lodge

EXECUTIVE SUMMARY

The intent of the *US 93 Ninepipe Corridor Feasibility Study* was to determine if a future project would be viable in terms of impacts, costs, and constructability.

Previously, the Montana Department of Transportation (MDT), Confederated Salish and Kootenai Tribes (CSKT), and Federal Highway Administration (FHWA) completed a *Final Environmental Impact Statement (FEIS)*¹ in 1996 and a *Supplemental Environmental Impact Statement (SEIS)*² in 2008. The SEIS identified a preferred alternative for the Ninepipe segment of US 93. Due to constructability challenges encountered in other segments of the US 93 corridor and the length of time elapsed since completion of the SEIS, MDT initiated this study to evaluate the feasibility of implementing the SEIS preferred alternative between Reference Points (RP) 40.0 (Gunlock Road) and 44.5 (Brooke Lane) as illustrated in **Figure ES-1**. Additionally, changed conditions since 2008 prompted a desire to investigate the feasibility of modified reconstruction options with the potential to reduce impacts and better serve the needs of the corridor in a manner that is potentially more cost effective and easier to implement.

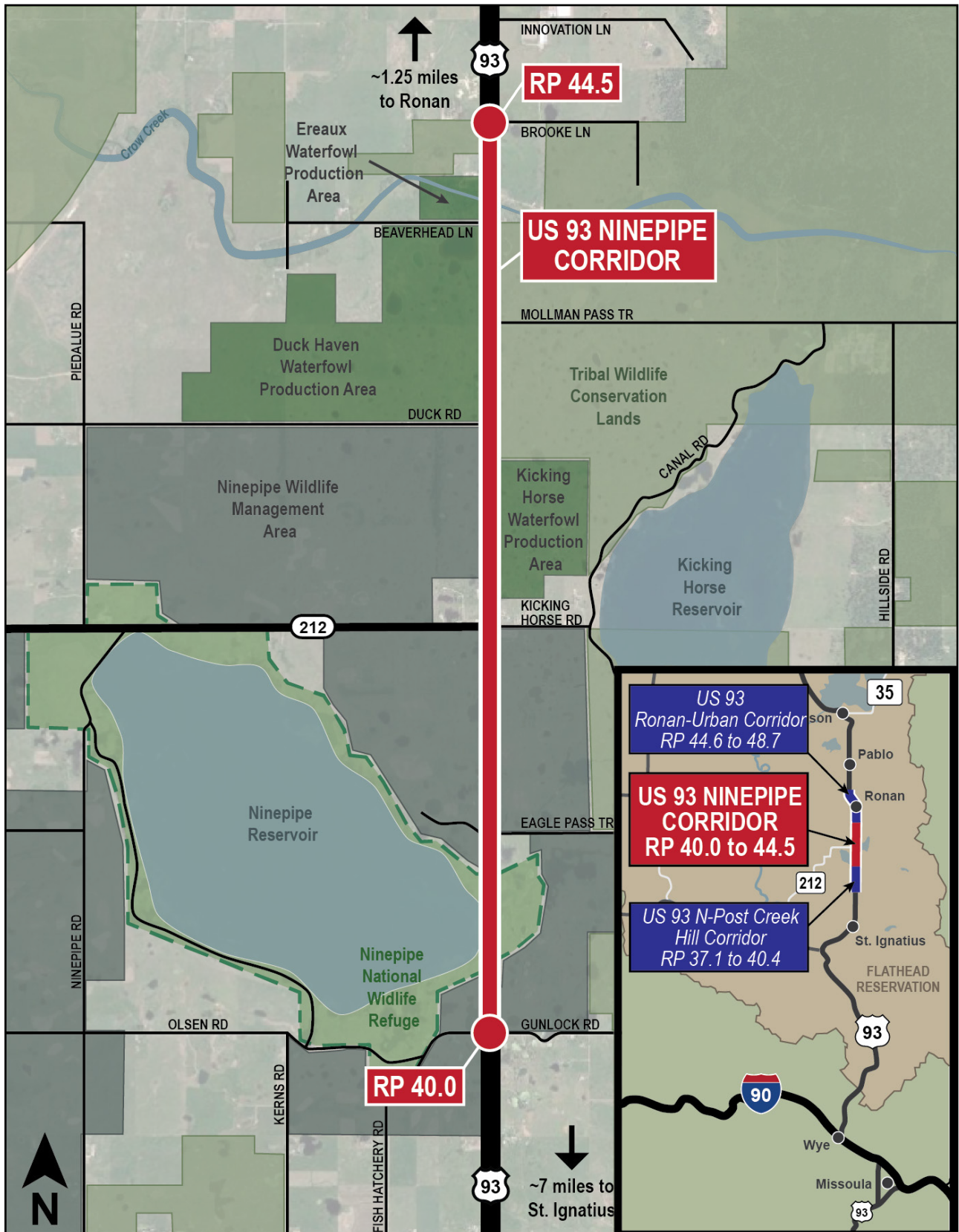


Figure ES-1: Study Area

The study was a collaborative process between MDT, CSKT, FHWA, resource agencies, and the public. Over the course of the study, MDT worked with partner agencies to gather updated data and information, identify potential constraints, and determine the viability of the preferred alternative outlined in the SEIS. Based on available information, changes since the SEIS, and input from partner agencies, modifications to the SEIS preferred alternative were developed to optimize benefits and reduce impacts. This feasibility study documents the comprehensive screening process used to assess the feasibility of the SEIS preferred alternative and other reconstruction options in terms of constructability, cost, and impacts. The evaluation highlights the tradeoffs of each option and aids in the determination of the most beneficial, practical, and feasible improvements for the corridor.

PUBLIC, STAKEHOLDER, AND RESOURCE AGENCY OUTREACH

Active participation and input were encouraged throughout the planning process. Key audiences included Tribal, state, and local agencies, stakeholder contacts, and the public. The study team employed the following engagement methods during the study.

- Developed a website to provide study information
- Posted study materials and other relevant documents online
- Outlined frequently asked questions and responses
- Maintained an email contact list of stakeholders and interested members of the public



The webpage for the feasibility study was hosted on MDT's website for easy public access.

Targeted outreach was conducted to encourage meaningful input and dialogue with agencies, stakeholders, and the public. The following activities helped the study team identify areas of concern and evaluate potential corridor improvements.

Advisory Committee (AC) Meetings were held throughout the course of the study. The study team met with AC members at key milestones to discuss study methods, review relevant conditions, identify improvement options, and present findings. Representatives from MDT, CSKT, and FHWA participated in the AC.

Resource Agency Meetings were held throughout the course of the study, including three virtual meetings on September 21, 2021, February 16, 2022, and April 13, 2022, and a field review on June 6, 2022. Representatives from MDT, CSKT, FHWA, US Fish and Wildlife Service (USFWS), US Army Corps of Engineers (USACE), Montana Fish, Wildlife and Parks (MFWP), and Montana Department of Environmental Quality (MDEQ) participated in the meetings.

Cultural Field Tours were held in the morning and afternoon on April 14, 2022, with Tribal Elders and staff from the Séliš-Qlišpé Culture Committee (SQCC), Kootenai Culture Committee (KCC), and CSKT Tribal Preservation Office (TPO). Ten Tribal Elders participated in the morning field tour, and four Tribal Elders participated in the afternoon field tour, in addition to TPO staff participation.

Tribal Council Presentations were conducted on September 30, 2021, and March 31, 2022. The purpose of these presentations was to provide an overview of the study process and summarize relevant conditions. A final presentation to the Tribal Council occurred on December 1, 2022, to present findings from the screening evaluation.

Virtual Informational Meeting #1 was held on February 8, 2022, using the Zoom platform, with 25 participants over two sessions. The meetings were formatted as a brief presentation followed by a question-and-answer sessions.

Informational Meeting #2 was held on January 11 and 12, 2023, during the public review period for the draft *US 93 Ninepipe Corridor Feasibility Study*. MDT hosted an in-person meeting at the Ninepipes Lodge on the 11th in addition to a virtual informational event at noon on the 12th.

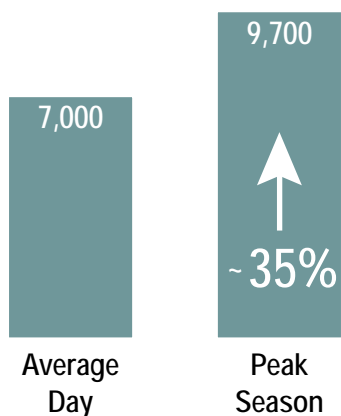
RELEVANT CONDITIONS

The study team conducted a review of relevant environmental conditions within the study area, including any changed conditions that have occurred since the 2008 SEIS. In some cases, updated analyses were conducted to help determine if any of the changed conditions may influence the feasibility or practicality of future corridor improvements. The following key findings were identified.

TRAFFIC AND SAFETY

- 2020 traffic volumes are similar to those documented for the year 2000 in the SEIS, with substantial variation from year to year.
- Peak summer traffic volumes are approximately 35 percent higher than those during an average day throughout the year.
- The corridor is projected to continue to operate at poor levels and may experience deteriorating operations depending on future traffic growth.
- The existing highway facility is not well suited to accommodate non-motorists due to high speeds, high traffic volumes, and lack of dedicated facilities.
- Crash rates have increased in comparison to the SEIS findings, however, the severity of crashes has decreased.
- The most common crash type is wild animal crashes, followed by fixed object and rear-end.
- Six percent of crashes were considered severe and included two head on, two rear-end, and one roll over crash.

US 93 TRAFFIC VOLUMES



LAND USE AND OWNERSHIP

- Most of the study corridor is surrounded by public lands, managed to support and preserve wildlife and serve recreation purposes.
- Twelve private landowners own parcels adjacent to the study corridor.
- Approximately half of adjacent parcels are categorized as residential/agricultural properties. Most remaining parcels are commercial/industrial/institutional uses.
- The recommended right-of-way width along the corridor is 160 feet for the SEIS preferred alternative. Generally, this minimum width is available, with narrower areas near Eagle Pass Trail and Brooke Lane.

VISUAL LANDSCAPE

- The ovoid, curvilinear form of the ponds and vegetation in the Ninepipe area distinctly contrast the straight lines of the highway.
- The Mission Mountains are the most visually prominent feature viewed from the corridor.
- The traffic along US 93 adds a dynamic visual element that contrasts the static character of the surrounding landscape.

SURFACE WATERS AND FLOODPLAINS

- US 93 crosses 6 surface water features within the study area, and two have associated floodplains.
- Approximately 140 feet of US 93 crosses the 100-year floodplain of Ninepipe Reservoir (a reduction of 190 feet since the SEIS).
- Approximately 645 feet of US 93 crosses the 100-year floodplain of Crow Creek (an increase of 95 feet since the SEIS).
- Existing culverts at Crow Creek may be inadequate to convey high water flows.

WETLANDS

- Three new wetlands totaling approximately 0.09 acre were delineated.
- Of the 82 wetlands previously identified in the 2008 SEIS, minor changes were noted for 26 while boundaries for 56 wetlands remained unchanged (net increase of 0.573 acre).



FISH AND WILDLIFE

- Numerous birds occur within the Ninepipe area, including ducks and other waterfowl, shorebirds, raptors, and passerine.
- The Ninepipe area supports a variety of mammals, including grizzly bears, deer, muskrats, badgers, beavers, skunks, raccoons, weasels, mink, river otters, squirrels, coyotes, fox, field mice, shrews, voles, and multiple bat species.
- Common reptile and amphibian species include western terrestrial garter snakes, western painted turtle, western garter snake, spotted frogs, long toed salamanders, pacific tree frogs, and western toads.
- The Ninepipe Reservoir and Crow Creek are the only waters within the study area known to provide aquatic habitat for fish.
- Documented occurrence has been recorded for two species of concern, including Forster's tern loon (with nesting reporting within 0.25 mile of the corridor) and bald eagle (with wintering individuals observed near RP 41.5).
- Deer cross throughout the US 93 corridor and are most represented in carcass data. Concentrated wildlife movement occurs near the core pothole area from RP 39.4 to 44.1 and in the Crow Creek riparian corridor at RP 44.2. Large numbers of birds and turtles are struck within the Ninepipe segment, particularly near the core pothole area.
- Since completion of the 2008 SEIS, grizzly bear occurrences have been increasingly documented, suggesting that the grizzly bear population is expanding. Grizzly bears are active in the Ninepipe segment, with high use documented near Crow Creek and in the area between Ninepipe and Kicking Horse reservoirs. Grizzly bear mortalities from vehicle collisions have increased significantly since 2000 and have notably accelerated since 2010.



COMMONLY STRUCK SPECIES
in the CORE POT HOLE AREA:
Deer, birds/waterfowl, and turtles

CULTURAL RESOURCES

- Three cultural resources occur within Ninepipe segment of the US 93 corridor.
- The Flathead Indian Irrigation Project (24LA0091) includes multiple canals crossing or paralleling US 93.
- The Stagecoach Route (No Site Number) follows the southwest edge of the Ninepipe Reservoir before crossing US 93 and continuing in a northeast direction through USFWS management lands.
- The Ninepipe Cultural Property (SKP-LA-284) encompasses the entire Ninepipe segment adjacent to US 93 and is considered a traditional cultural property due to its unique qualities as an environmentally rich area of kettle lakes and glacial wetlands. The entire setting, including wildlife and wetlands, is highly valued from a cultural perspective.

GEOLOGY AND SOILS

- Soils in the study area consist primarily of relatively soft clays, silts, and sands. Dense bearing layers were encountered at depths ranging from 50 to 80 feet, with the depth increasing as the project extends north towards Crow Creek. North of Crow Creek, a dense bearing stratum was not encountered to the testing termination depth of 160 feet.
- Minor liquefaction can be expected throughout the corridor.
- Groundwater is located between 10 and 15 feet below the ground surface. Evidence of artesian conditions was not observed.

ECONOMICS

- The rural nature of the Ninepipe area makes the economy largely dependent on transportation.
- Seasonal tourism is a major part of the local economy along US 93.
- A large percentage of sales in the project area is generated from travelers, especially during summer months.



3 CULTURAL RESOURCES
Stagecoach Route, Ninepipe Cultural
Property, and Flathead Indian Irrigation Project

CORRIDOR OPTIONS

Due to constructability challenges encountered in other segments of the US 93 Evaro to Polson corridor and the length of time elapsed since completion of the SEIS, MDT initiated this feasibility study to evaluate if the SEIS preferred alternative is viable in terms of impacts, costs, and constructability considerations. Additionally, changed conditions since 2008 prompted a desire to investigate the feasibility of modified reconstruction options which may reduce impacts and better serve the needs of the corridor in a manner that is potentially more cost effective and easier to implement. For this study, the SEIS preferred alternative was established as the baseline configuration to compare to all modified reconstruction options in terms of feasibility and impacts, with a common roadway configuration (two 12-foot lanes with widened 8-foot shoulders) and the provision of a shared use path (SUP) incorporated in all options.

Development and evaluation of modified reconstruction options involved a multi-step process. The first step involved an analysis of typical section and SUP options to establish initial assumptions for reconstruction of the corridor. The evaluation considered the relative benefits and disadvantages of each option in five categories, including transportation, ecological environment, fish and wildlife, human environment, and constructability.

The typical section options maintained the roadway configuration identified in the SEIS but incorporated changes to the inslopes and fill slopes to reduce impacts to natural resources. Typical Section T-1, the preferred typical section presented in the SEIS, was retained for evaluation of the SEIS preferred alternative. Typical Section T-2, which incorporated steeper fill slopes, was selected as a baseline assumption for all other corridor options because it would incorporate the safety benefits of widened shoulders while also minimizing impacts to the ecological and human environment including adjacent wetlands, habitat, and right-of-way.

The SUP options maintained the provision of a SUP throughout the corridor as dictated by the SEIS but considered alternate alignments and crossing locations. SUP Option S-1, representing the SEIS preferred alignment, was retained for evaluation of the SEIS preferred alternative. SUP Option S-2,

which would shift the alignment to the east beginning just south of Ninepipe Reservoir, was selected as a baseline assumption for all other corridor options because it would provide the greatest pedestrian and bicycle comfort while minimizing impacts and offering a logical connection to the current SUP alignment for the MDT US 93-Post Creek project.

The next step included development of corridor-wide options to comprehensively address the combination of roadway typical section, SUP alignment, and wildlife crossings. In addition to the SEIS baseline option, two modified corridor options were developed for consideration based on newly available information. All three options were then evaluated through a comprehensive screening process to determine overall feasibility and understand the tradeoffs and benefits between each option. The screening categories for this process included the five categories used for the typical section and SUP evaluation listed above in addition to a cost category. Key features associated with each of the corridor options are listed on the next page.



SUP Option S-2 was selected as a baseline assumption for all new corridor options developed for this feasibility study.

Option C-1: SEIS Preferred includes elements recommended in the SEIS preferred alternative.

- **Typical Section:** Standard 6:1 inslopes with standard fill slopes
- **Shared Use Path:** SUP with crossing north of Kettle Pond 2
- **Ninepipe Reservoir:** 660-foot bridge with 10 to 12 feet of vertical clearance, two 12x22-foot culverts, and two 10x12-foot culverts
- **Kettle Pond 1:** Two 60-foot bridges with 10 to 12 feet of vertical clearance and two 4x6-foot culverts
- **Kettle Pond 2:** Two 60-foot bridges with 10 to 12 feet of vertical clearance and two 4x6-foot culverts
- **Crow Creek:** 120-foot and 150-foot bridges with 10 to 12 feet of vertical clearance

Option C-2: Enlarged Wildlife Crossing Structures includes a single, longer bridge structure spanning the entire water body at each crossing location with increased vertical clearance to encourage greater use by wildlife.

- **Typical Section:** Standard 6:1 inslopes with steepened 3:1 fill slopes
- **Shared Use Path:** SUP with crossing south of Ninepipe Reservoir
- **Ninepipe Reservoir:** 660-foot bridge with 15 feet of vertical clearance, two 12x22-foot culverts, and two 10x12-foot culverts
- **Kettle Pond 1:** 800-foot bridge with 15 feet of vertical clearance
- **Kettle Pond 2:** 800-foot bridge with 15 feet of vertical clearance
- **Crow Creek:** 500-foot bridge with 15 feet of vertical clearance

Option C-3: Wildlife Overpass Configuration incorporates a wildlife overpass, with smaller structures at other locations providing the minimum bridge length needed to satisfy hydraulic and wildlife crossing requirements at each location.

- **Typical Section:** Standard 6:1 inslopes with steepened 3:1 fill slopes
- **Shared Use Path:** SUP with crossing south of Ninepipe Reservoir
- **Ninepipe Reservoir:** Single 300-foot bridge with 15 feet of vertical clearance, two 12x22-foot culverts, and two 10x12-foot culverts
- **Post A Canal:** Wildlife overpass

- **Kettle Pond 1:** Single 110-foot bridge with 10 to 12 feet of vertical clearance and two 4x6-foot culverts
- **Kettle Pond 2:** Single 110-foot bridge with 10 to 12 feet of vertical clearance and two 4x6-foot culverts
- **Crow Creek:** Single 500-foot bridge with 15 feet of vertical clearance

SCREENING

A screening process was used to determine which corridor options would be feasible to implement and to understand the tradeoffs between resource impacts, overall benefits, and project costs. Options were evaluated numerically according to their performance under six screening criteria. Starting from the five categories considered for the initial evaluation (including transportation, ecological environment, fish and wildlife, human environment, and constructability), the screening criteria were developed in more detail with the addition of a cost category. A numeric rating system was used to provide a comparison of options. The rating scale ranged from one to five, where a score of one (1) indicated very poor performance and/or the greatest negative impacts and a score of five (5) indicated very good performance and/or the greatest overall benefits. A total of 20 subcategories were defined under the six screening criteria, with a total of 5 possible points per subcategory and a total possible score of 100 for each option. Ultimately, the goal was to identify a preferred corridor option comprising the most feasible, beneficial, and cost-effective improvements for the corridor.

RATING SCALE

1	Very poor performance, substantial adverse impacts, or full barriers to implementation
2	Poor performance, some adverse impacts, or potential barriers to implementation
3	Fair or unchanged performance, no net impacts, or no net benefits
4	Good performance, some benefits, or feasible to implement
5	Very good performance, substantial benefits, or no anticipated barriers to implementation

Table ES-1 provides a summary of the scores allocated to each corridor option. As shown in the table, Option C-3 received the highest overall score (70 out of 100 points) and also scored the highest or tied for the highest score in all screening categories except ecological environment. Options C-1 and C-2 scored similarly (52 and 57 points out of 100, respectively) with C-2 scoring slightly higher due to superior operational, ecological, and fish and wildlife elements.

Table ES-1: Screening Summary

Screening Criteria		Sub-Criteria	Total Possible Points	C-1: SEIS	C-2 Enlarged Crossings	C-3: Wildlife Overpass
1	Transportation	1a. Operations	5	3	4	4
		1b. Safety	5	3	3	4
Transportation Subtotal			10	6	7	8
2	Ecological Environment	2a. Hydraulic Performance	5	2	4	3
		2b. Wetlands	5	2	4	3
		2c. Surface Water Resources	5	3	4	4
Ecological Environment Subtotal			15	7	12	10
3	Fish and Wildlife	3a. Aquatic Accommodations	5	3	3	4
		3b. Terrestrial Accommodations	5	2	4	5
		3c. Habitat	5	2	3	4
		3d. Threatened and Endangered Species	5	2	4	5
Fish and Wildlife Subtotal			20	9	14	18
4	Human Environment	4a. Cultural and Recreational Resources	5	3	4	4
		4b. Visual Quality	5	3	2	2
		4c. Adjacent Properties	5	1	2	2
Human Environment Subtotal			15	7	8	8
5	Constructability	5a. Geotechnical Considerations	5	4	2	3
		5b. Construction Feasibility	5	3	2	3
		5c. Construction Impacts	5	3	2	3
		5d. Construction Requirements	5	2	3	3
Constructability Subtotal			20	12	9	12
6	Cost	6a. Cost of Improvements	5	3	1	3
		6b. Maintenance Needs/Cost	5	3	2	3
		6c. Cost-Effectiveness	5	2	2	4
		6d. Fundability	5	3	2	4
Cost Subtotal			20	11	7	14
Total Score			100	52	57	70

CONCLUSIONS AND NEXT STEPS

The study determined that all three options are likely feasible to implement. There are no known conditions that would prohibit construction of the options given adequate funding availability. Option C-2 is anticipated to be most challenging to construct with a potentially prohibitive cost. While the SEIS preferred option is expected to be feasible in terms of impacts, costs, and constructability considerations, C-3 presents a less impactful option with more benefits and a lower cost. Based on this evaluation, Option C-3 was identified as the preferred option to advance for future project development. Option C-3 is illustrated in **Figure ES-2**.

For any future corridor projects advanced from this study, next steps would need to include funding identification, project nomination, project development including environmental documentation, and appropriate collaboration with resource agencies, stakeholders, and the public. No funding has been identified for corridor projects at the time of this report.

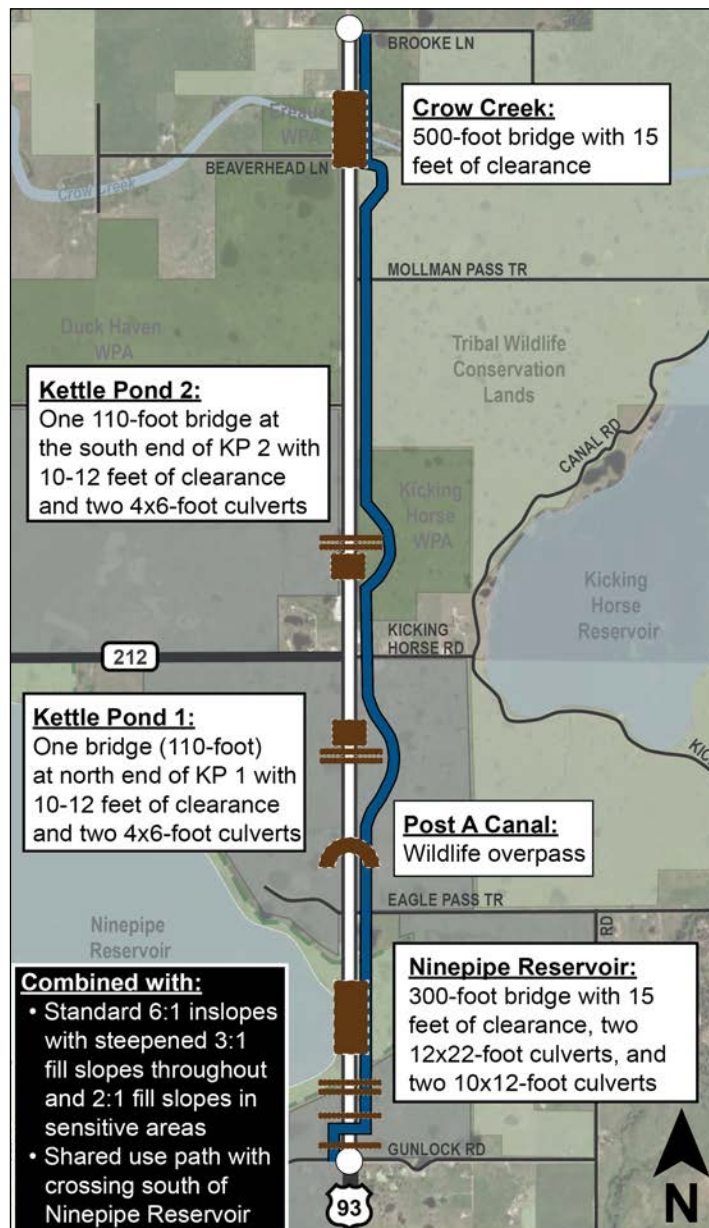


Figure ES-2: Option C-3: Wildlife Overpass Configuration

**NINEPIPE
CORRIDOR**



**FEASIBILITY
STUDY**



CHAPTER 1: INTRODUCTION

The 2008 *US 93 Ninepipe/Ronan Improvement Project Supplemental Environmental Impact Statement (SEIS)*² noted that US Highway 93 (US 93) is important to local, regional, and nationwide transportation. With poor existing traffic operations, projected increases in traffic volumes, multiple safety concerns, and a lack of dedicated pedestrian and bicycle facilities, the Montana Department of Transportation (MDT) and the Confederated Salish and Kootenai Tribes (CSKT) supported improvements to address safety and mobility in the US 93 corridor. MDT and CSKT also strived to minimize impacts to sensitive elements within the Ninepipe segment, including cultural and historic features, wetlands and waterways, wildlife and habitat, and other environmental resources.

Through a cooperative process involving MDT, CSKT, the Federal Highway Administration (FHWA), resource agencies, and the public, this study evaluated the Ninepipe segment of US 93 between Reference Points (RP) 40.0 (Gunlock Road) and 44.5 (Brooke Lane) as illustrated in **Figure 1**. The study focused on evaluating the feasibility of implementing the preferred alternative identified in the 2008 SEIS in terms of impacts, costs, and constructability, while also considering potential modifications to best meet the needs of the corridor.

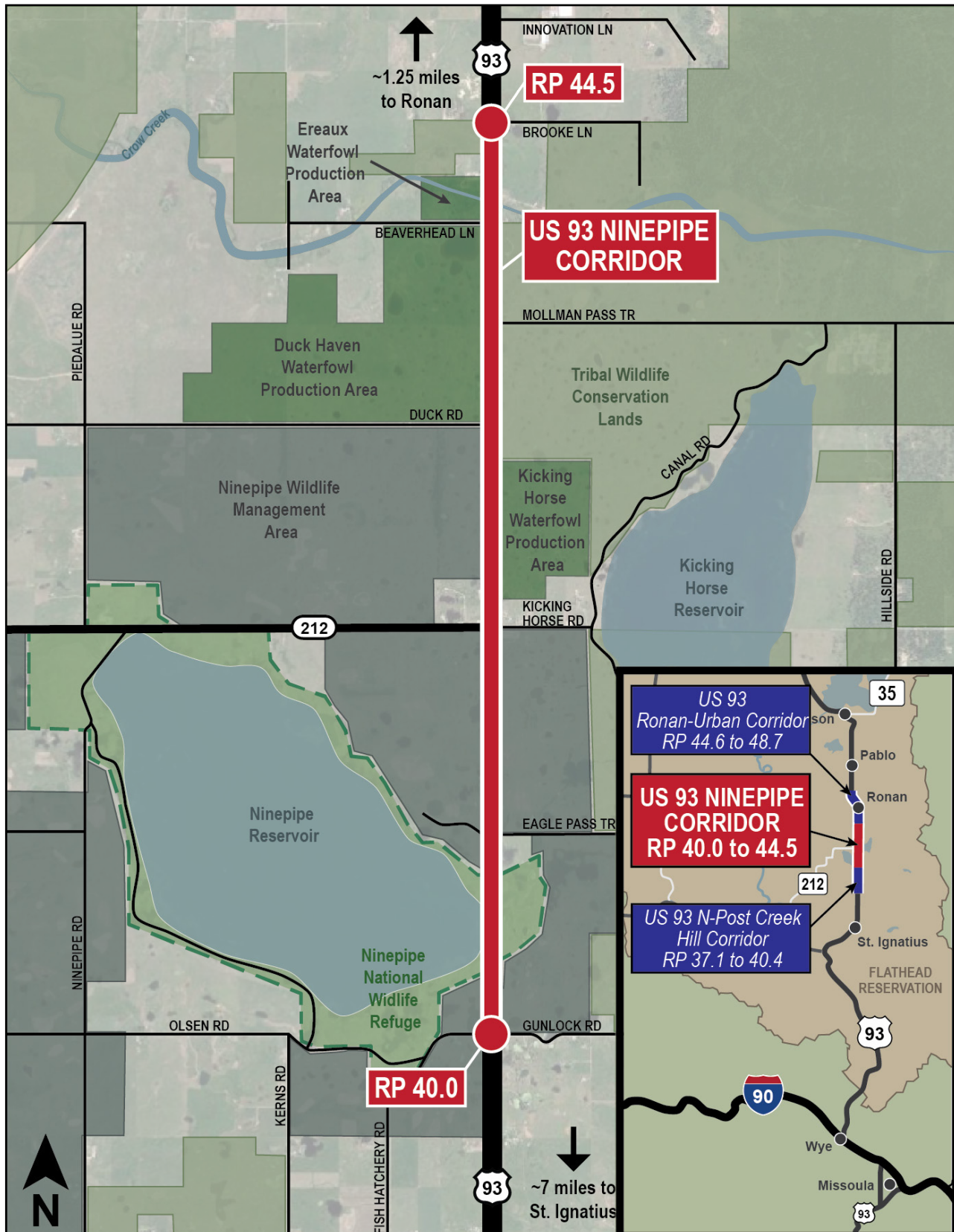


Figure 1: Study Area

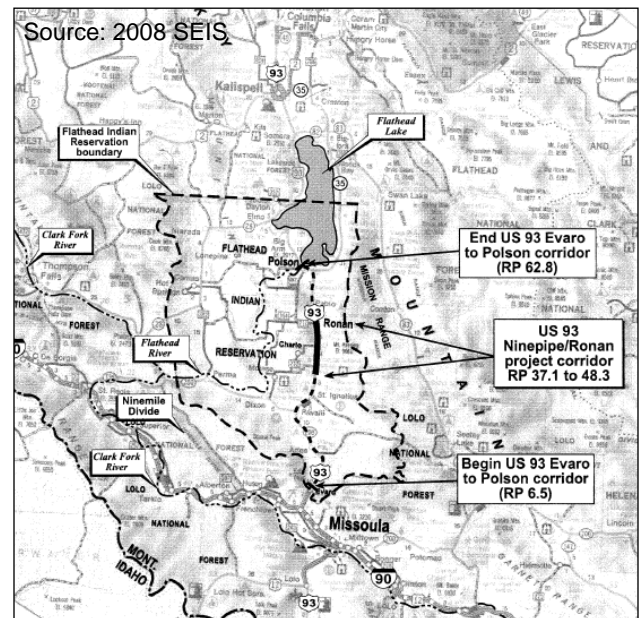
Over the course of the feasibility study, MDT worked with partner agencies to gather updated data and information, identify potential constraints, and determine the viability of the preferred alternative outlined in the SEIS. Based on available information, changes since the SEIS, and input from partner agencies, modifications to the SEIS preferred alternative were developed to optimize benefits and reduce impacts. This feasibility study documents the comprehensive screening process used to assess the feasibility of the SEIS preferred alternative and other reconstruction options in terms of constructability, cost, and impacts. The evaluation highlights the tradeoffs of each option and aids in the determination of the most beneficial, practical, and feasible improvements for the corridor.

1.1. Background and Previous Evaluation

In 1996, MDT completed a *Final Environmental Impact Statement (FEIS) and Section 4(f) Evaluation* for the portion of US 93 between Evaro and Polson, MT.¹ The Record of Decision (ROD) did not provide specific design details so MDT, CSKT, and FHWA agreed to prepare a supplemental environmental study of the Ninepipe/Ronan section (RP 37.1 to 48.3) to further explore possible alternate alignments and perform a detailed study on the effects of highway improvements on wetlands and wildlife in the corridor. In 2008, MDT, CSKT, and FHWA completed a *Supplemental Environmental Impact Statement (SEIS) and a Section 4(f) Evaluation* for the Ninepipe/Ronan section.²

The SEIS noted that US 93 is important to local, regional, and nationwide transportation. With poor existing operations, projected increases in traffic volumes, multiple safety concerns, and a lack of dedicated pedestrian and bicycle facilities, MDT and CSKT supported improvements to address safety and mobility in the US 93 corridor. At the same time, MDT and CSKT strived to minimize impacts to sensitive elements within the Ninepipe segment, including cultural and historic features, wetlands and waterways, wildlife and habitat, and other environmental resources.

The SEIS/ROD identified Alternative Rural 3 as the preferred alternative for the corridor. The configuration consisted of a two-lane roadway, widened shoulders, wildlife crossing structures, and a separated bicycle/pedestrian path within the Ninepipe segment connecting to a divided four-lane segment north of Brooke Lane and a northbound passing lane segment south of Gunlock Road, as shown in **Figure 2**. The SEIS noted “the preferred alternative was crafted to gain both safety and capacity improvements and, with the implementation of proposed mitigation, will not result in significant additional impacts to natural resources.”



The 1996 FEIS evaluated US 93 between Evaro and Polson, Montana. The 2008 SEIS evaluated a smaller section of the US 93 corridor between the Ninepipe area and the Town of Ronan. The Ninepipe/Ronan segment has been further segmented into three sections: US 93 N – Post Creek Hill, US 93 - Ninepipe (this study), and US 93 Ronan-Urban. Design efforts for the adjacent segments are underway and may influence the timing of improvements in the Ninepipe segment.

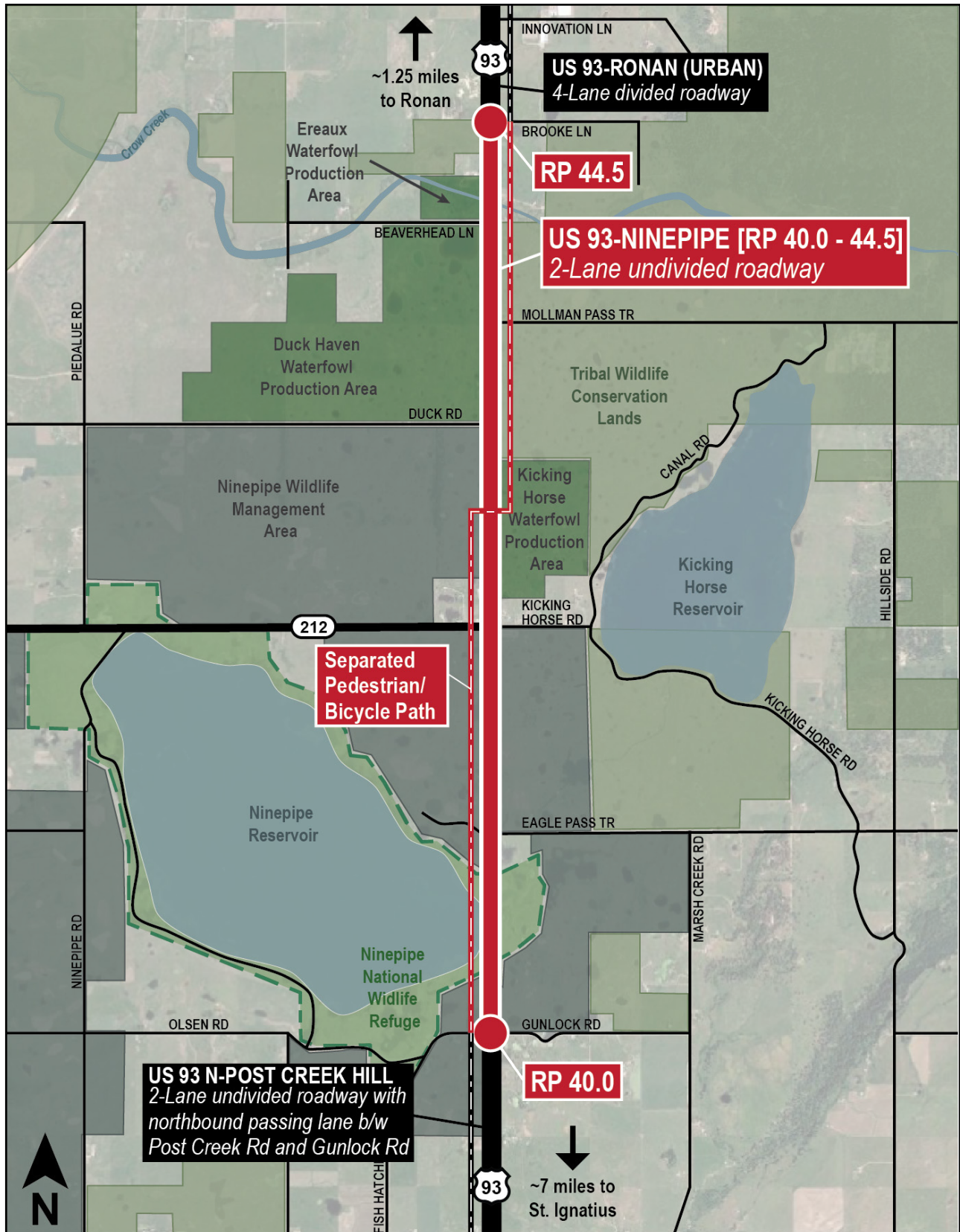


Figure 2: SEIS Preferred Alternative - Ninepipe Segment



CHAPTER 2: PUBLIC, STAKEHOLDER, AND AGENCY OUTREACH

An important aspect of the feasibility study process was to provide opportunities for ongoing and meaningful public, stakeholder, and agency involvement. A *Public and Agency Involvement Plan* was developed to identify outreach involvement activities to gain insights and seek input about study elements. The purpose of the plan was to ensure a proactive involvement process that provided opportunities for interested parties to be involved in all phases of the feasibility study process. Specific outreach activities are noted in this chapter. Meeting materials are provided in **Appendix 1**.

2.1. On-Demand Involvement Opportunities

On-demand involvement opportunities enabled participants to engage in the study process at their convenience. Key audiences included stakeholder organizations and the public.

Email Contact List

The study email contact list included individuals, stakeholders, and other groups with knowledge of the study area and individuals who attended public meetings. Emails were sent prior to informational meetings to encourage participation at scheduled events and to view updates to the website.

Study Website

MDT hosted a study website (<https://www.mdt.mt.gov/pubinvolve/us93ninepipe>) to encourage public interaction and provide study information. The website contained contact information, meeting announcements, newsletter/flyers, frequently asked questions about the corridor study process, a description of the study, and study reports. The website included links to MDT's commenting platform and other engagement/commenting opportunities.



The webpage for the feasibility study was hosted on MDT's website for easy public use and on-demand access to study content.

2.2. Targeted Outreach Events

Targeted outreach was conducted to encourage meaningful input and dialogue with agencies, stakeholders, and the public. The following activities helped the study team identify areas of concern and evaluate potential corridor improvements.

Advisory Committee Meetings

MDT facilitated a series of advisory committee (AC) meetings throughout the course of the study. The study team met with AC members at key milestones to discuss analysis methodologies, review relevant conditions, identify improvement options, and present findings. Representatives from MDT, CSKT, and FHWA participated in the AC. The committee advised the consulting team and reviewed study documentation before publication.



Resource Agency Meetings

MDT hosted a series of four resource agency meetings, including three virtual meetings on September 21, 2021, February 16, 2022, and April 13, 2022, and a field review on June 6, 2022. The purpose of the meetings was to provide an overview of the study, discuss resource areas of concern, share key findings from the relevant conditions analysis, present evaluation of the 2008 SEIS preferred alternative and potential modified improvements, view important locations within the Ninepipe corridor, and discuss opportunities for improved wildlife crossing accommodations and aquatic connectivity. Representatives from MDT, CSKT, FHWA, US Fish and Wildlife Service (USFWS), US Army Corps of Engineers (USACE), Montana Fish, Wildlife and Parks (MFWP), and Montana Department of Environmental Quality (MDEQ) participated in the meetings.

Topics of conversation included the study area, roadway alignment and configuration, shared use path alignment, traffic characteristics, wetlands, cultural resources, impacts associated with the baseline SEIS option and modified options, and wildlife considerations including occurrence, mortality, crossing behaviors and preferences, fencing, and habitat. Agency feedback directly influenced identification and evaluation of corridor options. Refer to **Appendix 1** for a summary of the meetings and comments received.



Several agency representatives attended field tours to discuss potential impacts to sensitive resources within the corridor such as wetlands, wildlife, and surface waters.

Cultural Field Tours

MDT facilitated cultural field tours in the morning and afternoon on April 14, 2022, with Tribal Elders and staff from the Séliš-Qlispé Culture Committee (SQCC) Kootenai Culture Committee (KCC), and CSKT Tribal Preservation Office (TPO). The tours were intended to provide information about study objectives and potential cultural impacts from potential improvements in the corridor. Ten Tribal Elders participated in the morning field tour, and four Tribal Elders participated in the afternoon field tour, in addition to TPO staff participation.

Tribal participants asked questions about the size and configuration of proposed bridge structures and stressed the importance of restoring the connectivity of the kettle ponds that are now physically bifurcated by the highway corridor to their original condition. Several participants also stressed the importance of creating a viable passage for aquatic and land-based wildlife. Issues of accident rates, fencing considerations, increasing traffic volumes, a four-lane vs two-lane configuration, and crossing structure height and length were also discussed.

Tribal Council Presentations

MDT representatives presented to the CSKT Tribal Council on September 30, 2021, March 31, 2022, and December 1, 2022. The purpose of these presentations was to provide an overview of the study process, summarize relevant conditions, and present study findings.

Virtual Informational Meeting #1

MDT hosted a set of informational meetings on February 8, 2022, using the online Zoom platform. To better serve the public, the meetings were held at two times, including 11 AM and 5 PM. Public notice was provided in multiple formats in advance of the meetings. A news release was issued to regional media outlets, advertisements were placed in the *Charkoosta* and *Missoulian* newspapers, and the *Missoulian* posted an article about the meetings. Direct invitations were mailed to 59 adjacent landowners. Electronic invitations were sent to 22 identified stakeholders and study contacts. Electronic notice was also posted to the study website. Approximately 17 members of the public attended the meeting held at 11AM, and approximately 8 members of the public attended the 5 PM meeting.

The purpose of the meetings was to provide an overview of the study process, summarize initial findings, and offer an opportunity for the public to ask questions and share feedback. The meetings began with a brief presentation followed by a question-and-answer period. Attendees with internet access could view presentation and submit written questions on the Zoom platform. Attendees without internet access could call into the meeting and listen to the presentation and responses.

Comment topics included the 2008 SEIS, lane configuration in the Ninepipe segment, potential project impacts to natural resources, access impacts to the Ninepipes Lodge and Museum, potential turn lanes, parking demand from increased non-motorized use in the corridor, project costs and funding, participation by stakeholder and advocacy groups, how members of the public can stay involved, and MDT's separate Eagle Pass Trail and Post Creek projects. Refer to **Appendix 1** for a summary of comments received.



Invitations to the virtual meetings were mailed to adjacent landowners.

Informational Meeting #2

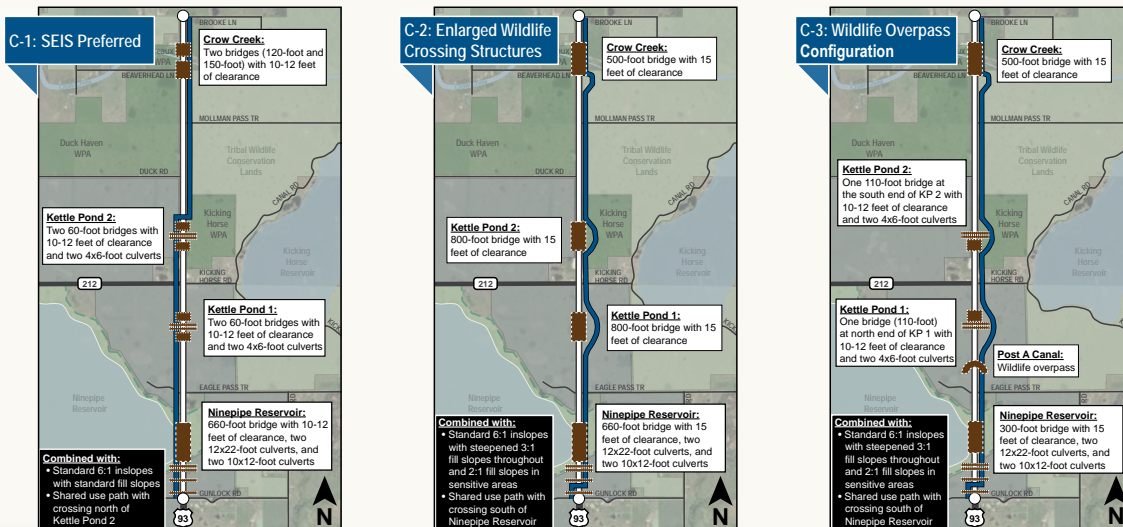
A second set of informational meetings was held on January 11 and 12, 2023, during the public review period for the draft *US 93 Ninepipe Corridor Feasibility Study*. To better serve the public, MDT hosted an in-person open house meeting at the Ninepipes Lodge the afternoon of the 11th in addition to a virtual informational event at noon on the 12th. Public notice was provided in multiple formats in advance of the informational meetings. A news release was issued to regional media outlets and advertisements were placed in the *Charkoosta* and *Missoulian* newspapers. Invitations were mailed to 67 adjacent landowners and emailed to 82 identified stakeholders and study contacts. Electronic notice was also posted to the study website. A total of 36 people signed in to the in-person open house, and additional attendees were present but chose not to sign in. A total of 35 people attended the virtual meeting.

The purpose of the meetings was to provide an overview of the study process, summarize findings from the study, and offer an opportunity for the public to ask questions and share feedback. Exhibits detailing study findings were provided at the in-person open house to guide discussions. Members of the planning team were present to answer questions and address comments from attendees. The virtual meeting began with a brief presentation followed by a question-and-answer period. Attendees with internet access could view presentation slides and submit written questions using the Zoom platform. Attendees without internet access could call into the meeting and listen to the presentation and responses.

Comment topics included the study evaluation process, preferred alternative, wildlife accommodations, construction impacts, funding, implementation, and next steps. Refer to **Appendix 1** for a summary of comments received.

CORRIDOR OPTIONS

Three corridor-wide options were evaluated to comprehensively address the combination of roadway typical section, shared use path alignment, and wildlife crossings. Planning-level alignments and roadway profiles were developed for each of the proposed configurations to assist with preparation of preliminary cost estimates and identification and quantification of benefits and impacts. A screening process was then used to determine which corridor options would be feasible to implement and to understand the trade-offs between resource impacts, overall benefits, and project costs. A total of 20 subcategories were defined under the six screening criteria, with a total of 5 possible points per subcategory and a total possible score of 100.



A series of exhibits were developed to illustrate corridor options and the screening process to the public. Participants were able to ask questions and provide feedback to the planning team at the second informational meeting.

2.3. Public Review Period

MDT facilitated a public review period coinciding with the release of the draft *US 93 Ninepipe Corridor Feasibility Study*. The review period started January 6, 2023, and ended February 6, 2023. During the review period, MDT received 17 comments submitted by email, MDT’s online portal, and by phone. A summary of common themes is provided in **Table 1**. A matrix listing each comment and a corresponding response is provided in **Appendix 1**.

Table 1: Summary of Comment Topics from Review Period

Comment Topic	Comment Summary
Coordination	Additional coordination between Tribal, federal, and state resource agencies and other non-profit organizations is desired to help identify funding opportunities and implement a reconstruction project in the corridor.
Cultural Resources	Special consideration for Tribal cultural values and resources should be provided within the US 93 corridor, with recognition of the spiritual and ecological significance of the wildlife species, habitat, wetlands, geological formations, and landscape of the Ninepipe segment.
Design Details	Recommendations were provided regarding specific design details for project features, including wildlife crossing structures, wildlife fencing, and the shared use path.
Funding and Implementation	A desire was expressed to identify funding and advance a reconstruction project as soon as possible to address corridor needs.
Land Use	Concern was expressed regarding potential future development and induced growth in the corridor. Conservation easements and other land use mechanisms should be pursued to protect areas from development and to control and direct growth in designated areas.
Lane Configuration	Some support was voiced for consideration of a 4-lane section and turn lanes at intersections to accommodate growing traffic volumes and to increase safety. However, others supported maintaining a two-lane roadway to minimize impacts to adjacent resources and properties.
Permanent Project Impacts	Methods to minimize direct project impacts to wetlands, cultural resources, and wildlife habitat should be employed, including steepened slopes and careful placement of the shared use path alignment. Evaluation of other impact categories including noise, land use, and cumulative impacts should be conducted before a project proceeds. Minimization of impacts should outweigh cost considerations.
Preferred Alternative	General support was expressed for the configuration and features included in the preferred alternative, with desire expressed for additional crossing structure length.
Safety	Continued focus on improving human safety is desired.
Shared Use Path	Support was voiced for providing dedicated bicyclist and pedestrian facilities in the corridor. Design and construction of the path should minimize impacts to adjacent wildlife habitat and wetlands.
Speeds	Interest was expressed in reducing the vehicular speed limit within the Ninepipe segment.
Temporary Construction Impacts	Impacts to the traveling public and adjacent property owners should be minimized during construction, with special focus on minimizing the potential for traffic detours on county roads.
Threatened and Endangered Species and Other Wildlife	Protection of grizzly bears and their habitat is a major priority. A future reconstruction project should incorporate the most current research and guidelines to enhance wildlife habitat connectivity across the highway and minimize wildlife mortality, with special focus on grizzly bears.
US 93 Corridor – Other Segments	Consideration should be given as to how the Ninepipe segment connects to other segments of US 93 to the north (in Ronan) and the south (in the Post Creek Hill area), both in terms of highway function and cumulative impacts. Advancement of the current project in the Post Creek Hill segment south of the Ninepipe segment is desired.

**NINEPIPE
CORRIDOR**



**FEASIBILITY
STUDY**

Source: MontanaRightNow.com

CHAPTER 3: RELEVANT CONDITIONS

This chapter includes a summary of the relevant environmental conditions within the study area, including any changed conditions that have occurred since the 2008 SEIS. In some cases, updated analyses were conducted to help determine if any of the changed conditions may influence development of the preferred alternative. Detailed information is included in the *Summary of Relevant Conditions* technical memorandum and supporting appendices, contained in **Appendix 2**. The conditions discussed in the following sections are considered relevant to the feasibility determination and may influence the need, feasibility, or practicality of future corridor improvements.

3.1. Traffic and Safety

US 93 is a National Highway System (NHS) route that is important to the local, state, and nationwide transportation system. US 93 provides linkage between other highway routes and Interstate 90. US 93 provides access to Flathead Lake and Glacier National Park, two popular destinations in northwest Montana.

Considering the importance of US 93 to the transportation network, the corridor experiences high traffic volumes and poor levels of service. The roadway consists of one travel lane in each direction and shoulders of varying width. The SEIS determined that reconstruction of the corridor is needed to improve safety, provide multimodal accommodations, and to ensure that the corridor can operate efficiently under both existing and projected traffic conditions. For this study, updated traffic and safety conditions were evaluated to help determine if new information might influence development of the SEIS preferred alternative.

Existing Traffic Conditions

In the SEIS, traffic volumes in the year 2000 were between 7,500 vehicles per day (vpd) south of Montana Highway 212 (MT 212) and 8,750 vpd north of MT 212. For the feasibility study, an updated traffic analysis showed that 2020 traffic volumes ranged from approximately 7,000 vpd south of MT 212 to just over 8,500 vpd to the north, slightly less than those documented in 2000 for the SEIS. Summer traffic volumes were approximately 35 percent higher when unadjusted for seasonal variation.

The MDT *Traffic Engineering Manual*^β lists a target level of service (LOS) of B for an NHS Non-Interstate route with rolling/level terrain. A previous agreement, approved during development of the SEIS, allowed for some exceptions to the normal MDT policy to balance improved traffic operations with potential negative resource impacts.

The highway currently operates at LOS D during an average day and during a summer weekday. A roadway operating at LOS D is characterized by a high percentage of vehicles traveling in platoons. Passing demand is high but passing capacity approaches zero so drivers will spend a lot of time following slower vehicles. These results are similar to findings from the SEIS traffic analysis.

Projected Traffic Conditions

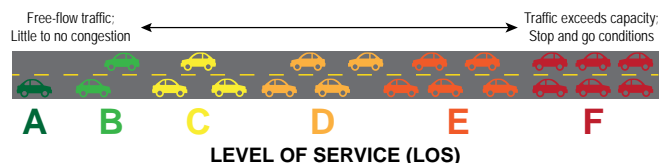
The SEIS identified a future growth rate of 2.8 percent per year for rural portions of US 93 based on historic traffic patterns. When averaged over the most recent 20 years, annual traffic growth has been negligible due to reduced traffic volumes between 2008 and 2014. More recently, traffic volumes have grown to values close to those experienced in the early 2000s.

Projected operations show that the corridor will experience degrading operations under low, moderate, and high growth scenarios. Under low growth conditions, the corridor is projected to operate at LOS D. Under moderate and high growth projections, the LOS is shown to decrease to LOS E. This evaluation shows slightly better performance than the SEIS which projected the corridor to operate at LOS E by the year 2016.

Non-Motorized Transportation

There are no dedicated facilities for pedestrians and bicyclists along the study corridor. The existing roadway corridor has shoulders of varying width typically ranging from approximately four to six feet wide on each side. The SEIS documented minimal pedestrian and bicycle activity along the rural portions of the corridor. A model was completed which indicated failing service ratings for both pedestrian and bicycle quality of service based on the lack of separated facilities as well as the speed and volume of traffic. For US 93, the impact of the high speed along the rural section of highway combined with narrow shoulders resulted in the low rated quality of service F.

Minimal non-motorized activity was again documented during the 2021 data collection effort with only two bicyclists counted during the 48-hour period. This demonstrates that the existing highway facility is currently not well suited to accommodate non-motorists due to high speeds, high traffic volumes, and lack of dedicated facilities. Non-motorized demand is expected according to input from the public and partner agencies received during development of the SEIS.



Safety

According to data from January 1, 2015, through December 31, 2019, a total of 84 crashes occurred within the study area over the five-year period. Most crashes involved a single vehicle, with the most common crash type being wild-animal crashes, followed by fixed-object. The most common multiple vehicle crash type was rear-end, followed by right angle and sideswipe opposite direction. **Figure 3** presents the distribution of crash types within the study area.

Figure 4 presents a heat map representing the relative density of crashes. Crash clusters occurred at the intersections with Eagle Pass Trail, MT 212, and Beaverhead Lane. At those intersections, nearly half were wild animal or fixed object crashes unrelated to the intersections.

Fatal and suspected serious injury crash locations are also identified on **Figure 4**. Over the five-year period, one fatal crash resulting in three fatalities occurred and four suspected serious injury crashes resulting in eight total injuries occurred. The fatal crash was the result of a head-on collision and the suspected serious injury crashes included two rear-ends, one roll over, and one head on crash. Most crashes (59) resulted in property damage only (PDO).

A summary comparison between the SEIS and updated data is provided in **Table 2**. As shown in the table, the crash rate for the Ninepipe corridor is higher based on updated crash data compared to the SEIS. However, updated crash data indicate a lower severity rate, percent of fatalities, and rate of head on and intersection crashes.

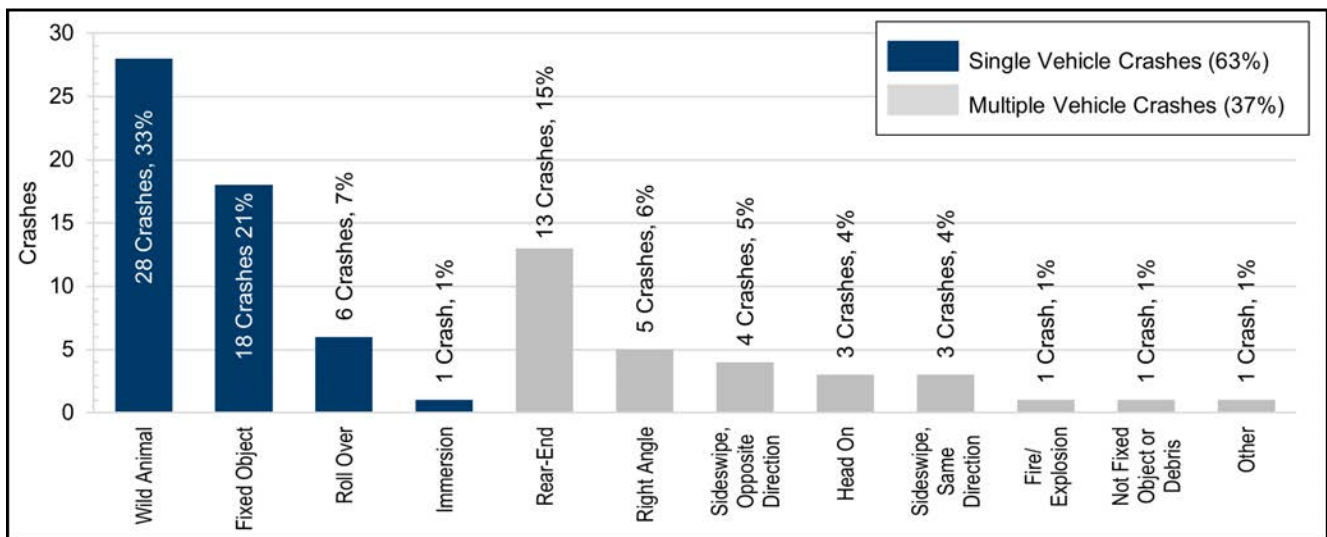


Figure 3: Crash Type (2015-2019)

Table 2: Crash Data Comparison

Comparison Metric	2008 SEIS ⁱ	Updated Crash Data ⁱⁱ
Crash Severity	5% Fatal	1% Fatal (6% severe)
Crash Rate	2.8 crashes per mile per year	4.3 crashes per mile per year
	0.98 crashes per million vehicle miles of travel	1.44 crashes per million vehicle miles of travel
Crash Type	6% Head On	3.6% Head On
Severity Rate	2.86	2.27
Noted Contributor	33% at or related to intersections/driveways	17% at or related to intersections/driveways

ⁱ Data includes rural segments of US 93 between Evaro and Polson (1995-2003)

ⁱⁱ Source: MDT Traffic and Safety Bureau (2015-2019) for Ninepipe corridor (RP 40.3 to RP 44.2)

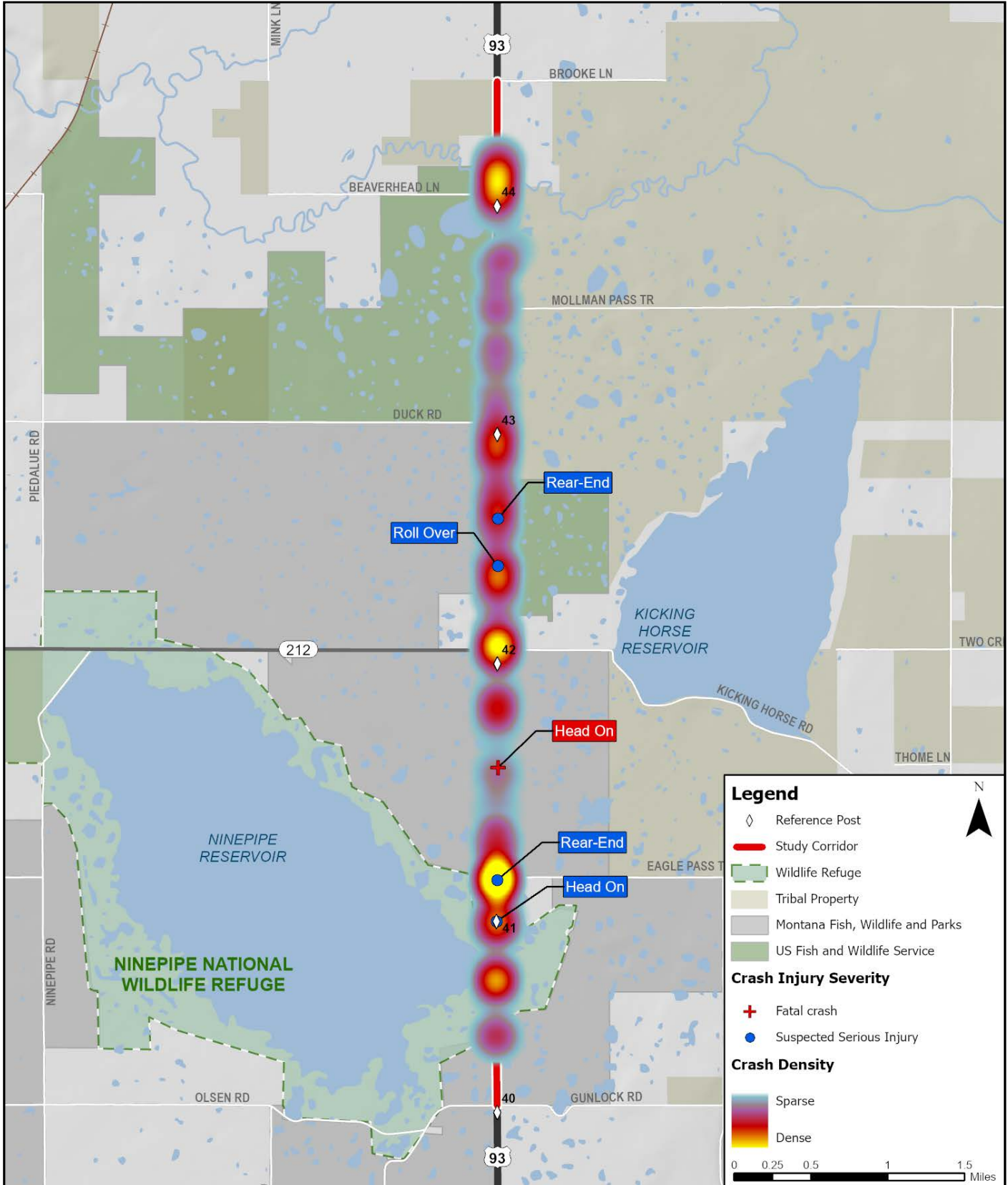


Figure 4: Crash Location Map (2015-2019)

3.2. Land Use and Ownership

Evaluation of adjacent land use, ownership, and roadway right-of-way boundaries aids in the determination of impacts that may potentially result from construction activities. Impacts may include minor right-of-way acquisition in addition to access modifications for adjacent properties or intersecting roads along the study corridor.

Land Use

An inventory of land uses in the corridor is shown in **Table 3**. Both the SEIS and the feasibility study analysis found that approximately half of parcels immediately adjacent to the study corridor are categorized as residential/agricultural properties. Most remaining parcels are commercial/industrial/institutional uses. A small number of parcels, including the Ninepipe National Wildlife Refuge (NWR) and other recreational land, parks, or open space, are classified as other or unknown.

Table 3: Inventory of Land Uses by Parcel

Source	Residential/ Agricultural	Commercial/ Industrial/ Institutional	Other or Unknown
2008 SEIS	16	10	2
2021	18	12	2

Source: 2008 SEIS; Montana Cadastral, December 2021

Recreation activity in the project area primarily consists of dispersed recreation areas managed for high wildlife habitat value and have little, if any developed facilities. Within the Ninepipe segment, US 93 borders several Section 4(f)-protected recreational properties including the Ninepipe NWR, Duck Haven Waterfowl Production Area (WPA), Kicking Horse WPA, Ereaux WPA, Ninepipe Wildlife Management Area (WMA), and CSKT wildlife management lands.



Source: USFWS; Trip Advisor

Section 4(f) recreational properties within the study area are managed primarily for the protection of wildlife.

Ownership

As presented in **Figure 5**, most of the study corridor is surrounded by public lands, with ownership varying between Tribal property, MFWP property, and USFWS property. These public lands are managed to support and preserve wildlife in the area. Additionally, 12 private landowners own one or more parcels adjacent to the study corridor.



The Ninepipes Lodge and adjacent Ninepipes Museum of Early Montana (pictured) are privately owned properties within the study corridor.

Right-of-Way

The corridor was evaluated to determine existing right-of-way widths and property boundaries based on available highway right-of-way monumentation. The SEIS specified a minimum desirable right-of-way width of 160 feet for the Ninepipe segment to accommodate the preferred alternative including a two-lane roadway, widened shoulders, and a separated bicycle/pedestrian path. MDT generally owns the minimum width throughout the corridor although some areas of MDT-owned right-of-way are narrower. South of Eagle Pass Trail adjacent to the Ninepipes Lodge, the right-of-way width is 100 feet. North of Eagle Pass Trail, the right-of-way width is 130 feet. At the northern end of the study area south of Brooke Lane, the right-of-way width is 140 feet.

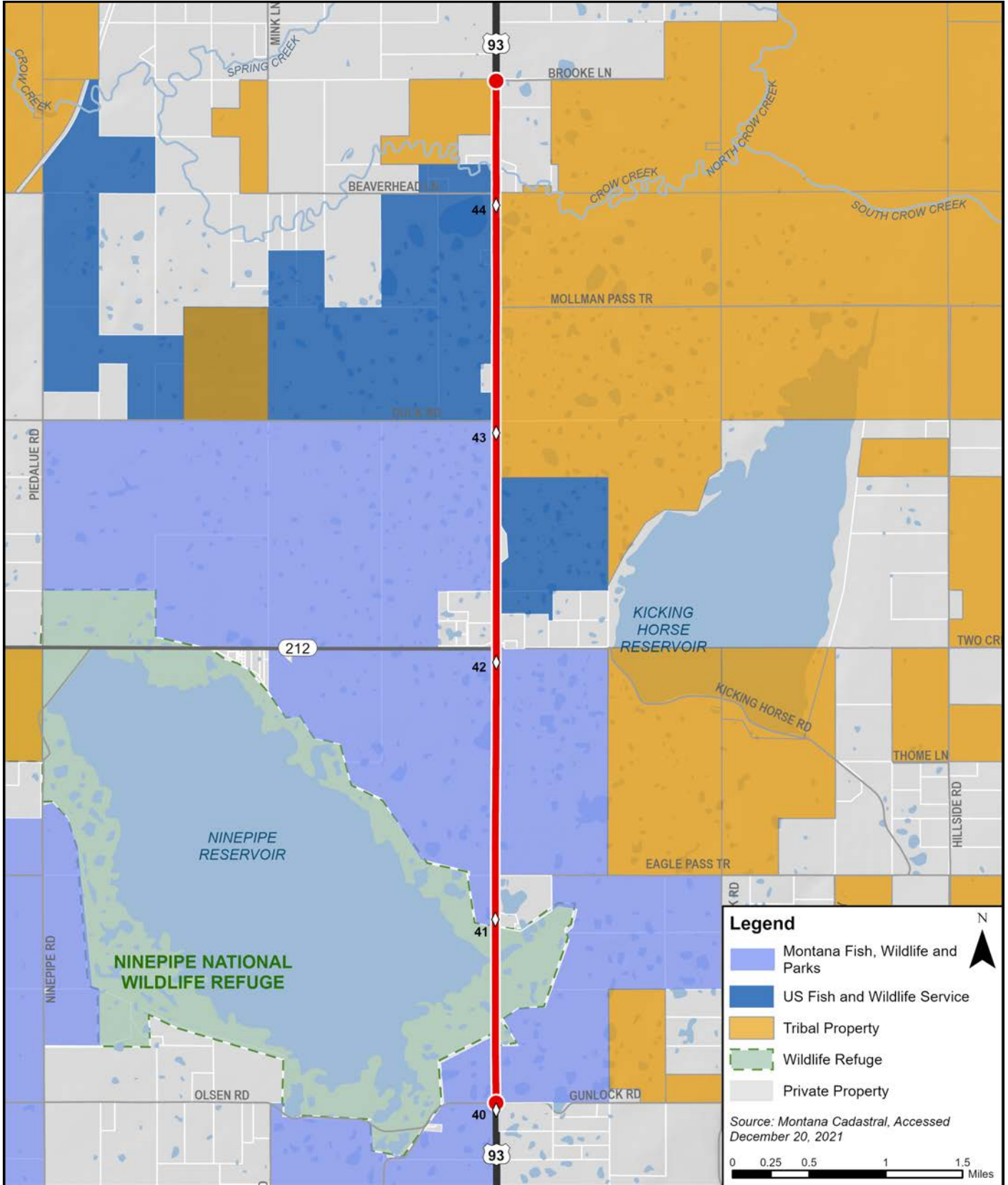


Figure 5: Existing Land Ownership

3.3. Wetlands

The Ninepipe segment is located in a core pothole area with numerous wetlands present in the study corridor. Wetland types include those associated with riparian zones, glacial potholes, irrigation features, and roadside ditches.

All Waters of the United States (WOTUS), including wetlands, are regulated by the USACE under the Clean Water Act (CWA) Section 404. Additionally, wetlands on the Flathead Indian Reservation are also regulated by CSKT under the Aquatic Lands Conservation Ordinance (ALCO) 87A. Wetlands are further protected under Executive Order (EO) 11990, which requires federal agencies to minimize the loss or degradation of wetlands and enhance their natural value.

For wetlands with no connection to a WOTUS, permanent wetland impacts will be mitigated in accordance with FHWA “no net loss” guidance and EO 11990. CWA Section 401 and CSKT mitigation requirements will also be confirmed during future project development activities. **Appendix 2** provides additional information about the wetlands analysis conducted for this study.



There are 85 delineated wetlands located within the study corridor. The wetlands vary in size, functionality, quality, and USACE jurisdictional status. The wetlands are protected and regulated by USACE and CSKT.

Delineation

In 2021, 85 wetlands were delineated totaling 110.58 acres, reflecting three newly identified wetlands totaling 0.087 acre since the 2008 SEIS. Compared to the delineation presented in the 2008 SEIS, minor changes were noted where new wetlands had formed in roadside ditches and where existing wetland boundaries were modified to reflect updated conditions. Of the 82 previously identified wetlands, minor changes were noted for 26 wetlands, and boundaries for 56 wetlands remained unchanged. These changes resulted in a net increase of 0.573 acre of wetlands, in addition to the newly identified wetlands.

Classification and Functional Assessment

Approximately 82 percent of the wetland acreage in the corridor is Category II wetlands, as defined under the 2008 *Montana Wetland Assessment Method*⁴ (MWAM). No wetlands within the corridor are classified as Category I, which is the highest MWAM functional rating. This generally supports the findings of the 2008 SEIS with changes to three wetlands resulting from differences between the 1999 to 2008 MWAM rating systems. These three wetlands degraded from Category III to Category IV, which is the lowest quality wetland under the MWAM rating system.

Preliminary Jurisdictional Review

Preliminary review indicates the presence of wetlands anticipated to be considered within the jurisdiction of USACE (12 wetlands) based on their connection to WOTUS as well as those outside USACE jurisdiction (73 wetlands). This supports the findings of the 2008 SEIS with the addition of the three newly identified wetlands, including one jurisdictional and two non-jurisdictional wetlands based on preliminary review. Regardless of USACE jurisdictional status, CSKT may require mitigation for all impacted wetlands within the Flathead Reservation, in accordance with the Aquatic Lands Conservation Ordinance (ALCO) and Wetland Conservation Plan.

3.4. Surface Waters and Floodplains

The US 93 Ninepipe study corridor is located in the Mission Valley within the Lower Flathead Subbasin (HUC 17010212). The study area crosses both the Mission Creek and Crow Creek watersheds, which both originate in the Mission Mountains Tribal Wilderness and drain west to the Flathead River downstream of Flathead Lake. The SEIS noted that the most severe flooding in Lake County occurs in the spring and early summer due to snowmelt in the Mission Mountains and rainfall runoff.

Federal and state laws, regulations, executive orders, policies, and guidelines require transportation officials to identify, evaluate, and minimize impacts to floodplains and streams. All projects with federal sponsorship must comply with *Executive Order 11988 – Floodplain Management*, which requires federal agencies to reduce the risk of flood loss, minimize the impact of floods on human safety, and restore and preserve the natural and beneficial values served by the floodplains. At the state level, MFWP administers the *Montana Stream Preservation Act* for activities that disturb the bed or bank of a stream, and the Montana Department of Natural Resources and Conservation (DNRC) administers the *Montana Floodplain and Floodway Management Act* which covers all new construction within a floodplain. At the Tribal government level, the CSKT Shoreline Protection Office administers ALCO 87A, which regulates construction activities in aquatic lands of the Flathead Indian Reservation including lakes, rivers, streams, mudflats, wetlands, sloughs, potholes, and ponds. WOTUS (including streams and some irrigation canals) are subject to regulation under the CWA Section 404 permit administered by the USACE.



US 93 crosses several surface waters within the study corridor. The crossings consist of culverts and bridges, some of which are too small to convey high water flows.

Surface Waters

The following water resources are located within the Ninepipe segment:

- **Siphon** is a non-jurisdictional irrigation system that crosses under US 93 at RP 40.2 via a 154-foot long, 18-inch diameter culvert.
- **Ninepipe Reservoir** is an off-channel water storage facility. US 93 crosses the inlet of the reservoir at RP 40.7 via a 77-foot-long timber bridge.
- **Post A Canal** is conveyed under US 93 at RP 41.5 via a 121-foot-long, 73x45-inch reinforced concrete pipe.
- **Kettle Pond 1** is crossed by US 93 from RP 41.6 to 41.8 and **Kettle Pond 2** is crossed by US 93 from RP 42.5 to 42.6. US 93 crosses these ponds on earthen berms with a 24-inch corrugated steel equalizer culvert.
- **Crow Creek** flows through the project corridor between RP 44.1 and 44.2 and is conveyed under US 93 at approximately RP 44.2 through two 10x14-foot culverts.
- **Ronan A Canal** is located adjacent to US 93 between RP 44.2 and 45.1 on the west side of the highway.

Water from Post Creek, south of the study corridor, supplies Ninepipe and Kicking Horse Reservoirs. The SEIS noted that the 10-year flood flow of Post Creek is estimated to be 1,290 cubic feet per second (cfs).

The SEIS noted that the 100-year flood flow in Crow Creek at the US 93 crossing was estimated to be 1,020 cfs. The SEIS also reported that Crow Creek has previously over-topped the US 93 roadway due to inadequate conveyance capacity. The existing culverts are generally inadequate to convey high water flows during storms.

Water Quality

All surface waters in the project corridor are classified 'B-1', which means they must be maintained suitable for drinking and culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; wildlife (birds, mammals, amphibians and reptiles); the growth and propagation of salmonid fishes and associated aquatic life; and agricultural and industrial water supply purposes.

The SEIS found that the beneficial uses of Crow Creek are impaired due to habitat alteration, siltation, elevated water temperatures, and increased nutrients in tributary runoff. Probable sources of impairment include irrigated agriculture and irrigation return flows, rangeland uses, pastures, floodplain disturbance, and commercial and residential development.

Shallow groundwater is used as a primary source of domestic water throughout the rural portion of the project corridor. Existing highway ditches intercept shallow, unconsolidated aquifers on the valley floor (valley-fill aquifers) at numerous sites in the Ninepipe Area. These shallow aquifers are vulnerable to contamination from infiltrated runoff.

Floodplains

Based on updated floodplain mapping conducted by the Federal Emergency Management Agency (FEMA) in 2013, the Ninepipe segment of US 93 passes through two floodplains. The floodplains are described below and are illustrated in **Figure 6**.

- **Ninepipe Reservoir:** Approximately 140 feet of US 93 roadway crosses Zone A - 1% annual chance flood (100-year floodplain) of the reservoir.
- **Crow Creek:** Approximately 645 feet of US 93 roadway crosses Zone A - 1% annual chance flood (100-year floodplain) associated with Crow Creek.

Compared to the 2008 SEIS, which relied on floodplain mapping prepared in 1987, the Ninepipe Reservoir floodplain is 210 feet narrower, and the Crow Creek floodplain is 95 feet wider at the US 93 crossings. There are no floodplains associated with the Kettle Ponds or other surface water features in the corridor.

As noted in the SEIS, Lake County is participating in the National Flood Insurance Program (NFIP) and has adopted standards for floodplain management, including requiring a floodplain permit for any encroachment or crossing of a designated floodplain. However, CSKT is not participating in the NFIP, and the Flathead Indian Reservation is not subject to federal floodplain development regulations, therefore it has not been mapped for floodplains. Since no specific criteria have been developed by CSKT, federal floodplain standards would likely be applied within the study corridor.

3.5. Fish and Wildlife

The Ninepipe area supports an abundance of fish and wildlife due to the diversity of habitats in the vicinity and protected land status associated with the Ninepipe National Wildlife Refuge. The refuge includes a 1,672-acre reservoir and nearly 400 acres of surrounding grasslands. Additional grassland areas surrounding the refuge include nearly 3,500 acres of state WMAs, approximately 3,000 acres of Tribal lands, many of which are dedicated to wildlife and wildlife habitat uses, and 2,000 acres of USFWS conservation easements and WPAs. The proximity of Flathead Lake, the Pablo National Wildlife Refuge, and the Mission Mountain Range also contribute to the abundance of wildlife in the project area. The abundant wildlife species are highly valued by CSKT for their cultural significance. **Appendix 2** provides additional information about the wildlife analysis conducted for this study.



Source: Montana Office of Tourism

The natural landscape of the Ninepipe area including grasslands, wetlands, surface waters, and surrounding mountain ranges provide habitat for a variety of fish and wildlife.

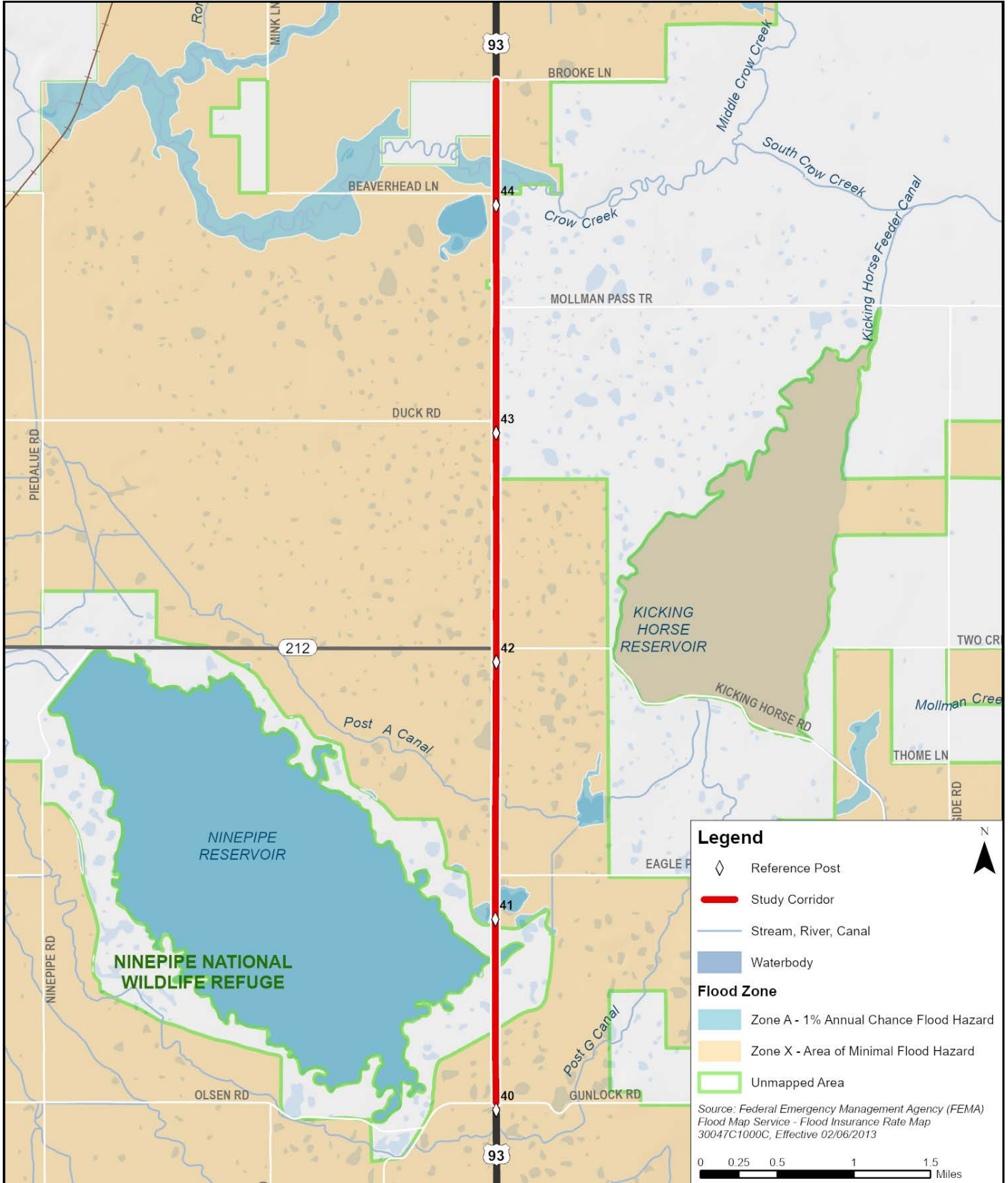


Figure 6: Floodplains and Streams

Birds

The SEIS noted numerous birds within the Ninepipe area, including 188 different bird species observed on the Ninepipe and Pablo National Wildlife Refuges. The most abundant bird group was waterfowl, with the highest numbers occurring in the spring and fall during peak migration periods. **Table 4** lists some of the most common bird species noted to occur within or near the study corridor.

Table 4: Birds Occurring Within Study Area

Bird Group	Species
Ducks	Redhead, ruddy duck, canvasback, lesser scaup, ring-necked duck, mallard, pintail, wigeon, green-winged teal, blue-winged teal, cinnamon teal, northern shoveler
Other Waterfowl and Waterbirds	Canada goose, snow goose, merganser, goldeneye, bufflehead, swan, trumpeter swan, western grebe, great blue heron, cormorant, American bittern, sora rails, Wilson’s phalarope, Forster’s tern loon
Shorebirds	Long-billed curlew, American avocet, black-necked stilt, common snipe, spotted sandpiper, killdeer
Raptors	Rough-legged hawk, northern harrier, red-tailed hawk, Swainson’s Hawk, short-eared owl, great gray owl, barred owl, barn owl, western screech owl, saw whet owl, pygmy owl, great-horned owl, long-eared owl, bald eagle
Passerine	Swallow, magpie, horned lark, marsh wren, American robin, common yellowthroat, house sparrow, western meadowlark, sparrow, yellow-headed and red-winged blackbirds

Source: 2008 SEIS.

The Ninepipe National Wildlife Refuge is included in an Audubon Society Important Bird Area (IBA). The IBA consists of the national wildlife refuge and the MFWP Ninepipe WMA that surrounds the refuge. Ninepipe Reservoir supports breeding colonies of western grebes, red-necked grebes, double-crested cormorants, great blue herons, California gulls, Ring-billed gulls, and yellow-headed blackbirds. At least 11 species of ducks nest in the area, as well as small numbers of American bitterns and Caspian terns. Thousands of waterfowl, mostly Canada geese and mallards, congregate in ice-free areas of the reservoir during some winters, and Bald Eagles also are relatively common during the winter.⁵

Spring migration peaks from late March to early May when as many as 100,000 birds may be observed. Fall populations often peak to more than 200,000 birds in early October to late November. Waterfowl nesting occurs generally from April until July, and it was noted that the Ninepipe area was known to have some of the highest nest success rates in North America for the upland nesting duck.⁶

The SEIS reported high levels of mortality for non-game birds, upland game birds, and waterfowl for the segment of roadway crossing the Ninepipe core pothole area. The CSKT have confirmed large numbers of birds are killed on the highway, although no updated data are available.

Mammals

The SEIS identified a variety of mammals occurring within the Ninepipe area, including grizzly bears, whitetail deer, muskrats, badgers, beavers, striped skunks, raccoons, weasels, mink, river otters, ground squirrels, coyotes, red fox, field mice, shrews, and montane and meadow voles. Transient species likely to travel through the area without actively breeding included black bear, bobcats, and porcupine.

The area was noted to provide foraging opportunities for grizzly bears. Surrounding grasslands provide foraging habitat for deer, skunks, weasels, coyotes, red fox, mice, and voles. Riparian wetlands were assumed to support beavers, muskrats, mink, deer, and various other species, with additional species likely using riparian areas as cover during movement. Species of bat likely to occur within the area include the little brown bat, big brown bat, Yuma myotis, and western small-footed myotis.



Deer are known to present in the Ninepipe area and often cross US 93 within the study corridor.

Amphibians and Reptiles

The SEIS summarized amphibian and reptile occurrence based on a 1998 study⁷ conducted in the Ninepipe area. Based on this study, common reptile species included western terrestrial garter snakes, western painted turtle, and the western garter snake. Snakes are expected in grasslands near water, roadside ditches, and streams. Painted turtles are abundant in the area. They occur in ponds and lakes and migrate to upland areas to lay their eggs. The SEIS noted movements greater than several hundred meters are not uncommon.

Incidental observations noted the presence of two spotted frogs in the Ninepipe segment. No evidence of breeding was noted. Other amphibians that may occur in the area include long toed salamanders, pacific tree frogs, and western toads. These species breed in temporary or permanent ponds.

Fish and Other Aquatic Species

The Ninepipe Reservoir and Crow Creek are the only waters within the study area known to provide aquatic habitat for fish. Post A Canal may provide fish passage when it's in operation. Fisheries resources and aquatic habitat within the project corridor have been heavily impacted by urbanization and water diversions for irrigation.

The SEIS found that Ninepipe Reservoir provides habitat for largemouth bass, yellow and black bullhead, pumpkinseed sunfish, yellow perch, and rainbow trout. The water quality has degraded due to irrigation water withdrawals and inputs of stormwater runoff from US 93 crossing over the reservoir inlet causing undesirable fish habitat.

The SEIS also noted that Crow Creek has a low gradient and is sinuous with deep run habitat. The segment of Crow Creek flowing under US 93 has been straightened and deep pools exist under the crossing structures. The stream bank is mostly stable with reed canary grass, cattails, and sedges dominating. Brook, brown, and rainbow trout are documented in Crow Creek while largescale and longnose suckers, mountain whitefish, northern pikeminnow, redbreast shiner, and longnose dace are undocumented but expected to be present.

In general, the existing crossing structures within the corridor are poorly placed and undersized which limits the natural hydrologic regime of the associated streams and wetlands. These

conditions can, over time, reduce the functions and values of these streams, negatively affecting their ability to provide fish habitat.

Species of Concern

The SEIS reported five wildlife species of concern that may occur in the Ninepipe area, including the common loon, Caspian tern, Forster's tern, trumpeter swan, and bald eagle. Of these, documented occurrence has been recorded for Forster's tern loon (with nesting reporting within 0.25 mile of the corridor) and bald eagle (with wintering individuals observed near RP 41.5). The SEIS noted wintering bald eagles are found throughout the valley in the early part of the winter season. After freezing conditions occur, eagles congregate in areas with open water, such as Post Creek, Ninepipe Reservoir, and Flathead Lake, to prey on waterfowl, particularly coots. When calving season starts in mid-February, eagles distribute throughout the valley, foraging on after-birth.



Source: Montana FWP

Bald eagles are known to winter in the valley surrounding the Ninepipe area, including the Ninepipe Reservoir.

Threatened and Endangered Species

Several threatened and endangered species were mentioned in the SEIS. Only one species, the grizzly bear (listed as Threatened), was determined likely to occupy the Ninepipe area.

The SEIS also noted the US 93 corridor is located on the western front of the Northern Continental Divide Ecosystem (NCDE) grizzly bear recovery area, which roughly corresponds with the northern Rocky Mountain Range. From this recovery area, grizzly bears range into the Ninepipe area in the spring through late fall and occasionally cross US 93. The area also seems to provide an escape area for young dispersing males or females with cubs evading aggressive male bears.

The SEIS noted the species utilizes the area for foraging (eggs, small mammals, succulent aquatic vegetation and tubers). Grizzlies also forage on sedges and grasses and hunt for rodents on Ninepipe National Wildlife Refuge and surrounding lands.⁸ Grizzlies use the area around Kicking Horse Reservoir and the shelterbelts west of the highway. Grizzly bears likely access the study area from the Mission Mountains by way of the Post Creek riparian area and the Crow Creek riparian area. They are known to cross US 93 along Post A canal.

As of 2021, at least 37 female bears whose home range includes the bear management unit located immediately east of the Ninepipe segment are monitored using GPS collars. Of these, 22 GPS-collared female grizzly bears have home ranges on the east and west slopes of the Mission Range. The data from these collared bears showed that bears frequent the Post Creek riparian corridor, the foothills habitat east of Kicking Horse Reservoir, and the Ninepipe National Wildlife Refuge.⁹

Wildlife Movement Corridors and Mortality

The SEIS noted that although US 93 is a barrier to most species, wildlife still frequently cross the corridor. Mammals typically cross at locations where vegetation and topography provide adequate cover for secure movement between suitable habitats. However, white-tailed deer often cross in random patterns, as indicated in carcass data from 1998-2005 presented in the SEIS and in more recent carcass data provided by MDT for the period 2015-2019 (**Table 5** and **Figure 7**).

Crash data from 2015 to 2019 indicate animal strikes were distributed throughout the corridor with 28 total wild animal crashes occurring. No species information was provided with the crash data. Based on discussion with wildlife agency representatives, carcass data likely are not representative of wildlife mortality in the Ninepipe segment.

Table 5: Carcass Data

Location	1998-2005	2015-2019
RP 40.0 to 40.5	6 deer	1 whitetail deer
RP 41.2 to 41.8	10 deer	1 whitetail deer
RP 42.2 to 42.9	4 deer	none
RP 43.0 to 43.9	6 deer	3 whitetail deer
RP 44.0 to 44.8	4 deer, 1 coyote	2 whitetail deer

Source: 2008 SEIS and MDT 2021.

Since 2020, the CSKT have started documenting animal carcasses using electronic records updated in real time. The data indicate that white-tailed deer cross the highway at random locations, and they represent the majority of wildlife killed in the Ninepipe segment. Resource agency representatives noted black bear collisions are rare in the Ninepipe segment.

The SEIS noted wildlife crossings in the Ninepipe segment are centered around the core pothole area (RP 39.4 to 44.1), with high levels of mortality for non-game birds, upland game birds, waterfowl, small mammals, amphibians, and reptiles. After reptiles (primarily turtles), birds were the second most commonly struck wildlife recorded from 2002 to 2004. Commonly struck birds included swallows, blackbirds, and grouse/pheasants.

TURTLES

A study completed in 2006 contains the most recent data on turtles in the Ninepipe vicinity¹⁰. A total of 1,040 turtles were killed in the Ninepipe segment over the 2003 to 2005 period. The study showed hot spots for turtle mortality at Kettle Ponds 1 and 2 (RP 41.8/42.5) and south of the Beaverhead Lane turnout (RP 44.1). All three of these areas also appear to have important nesting areas on and adjacent to the road banks. Hydrology of the ponds was a more important influence on turtle movements than distance to the highway. Although a complete survey of turtle carcasses was not performed for this study, at least 50 carcasses were observed on the road shoulders between Kettle Ponds 1 and 2, indicating that there are still large numbers of turtles being killed there and in other areas along the Ninepipe segment. The CSKT have noted that many people are concerned and stop to try to help turtles, creating a danger on the highway.



Source: Kootenai Country Montana

The western painted turtle is known to occur in the study area with a mortality concentration around the kettle ponds.

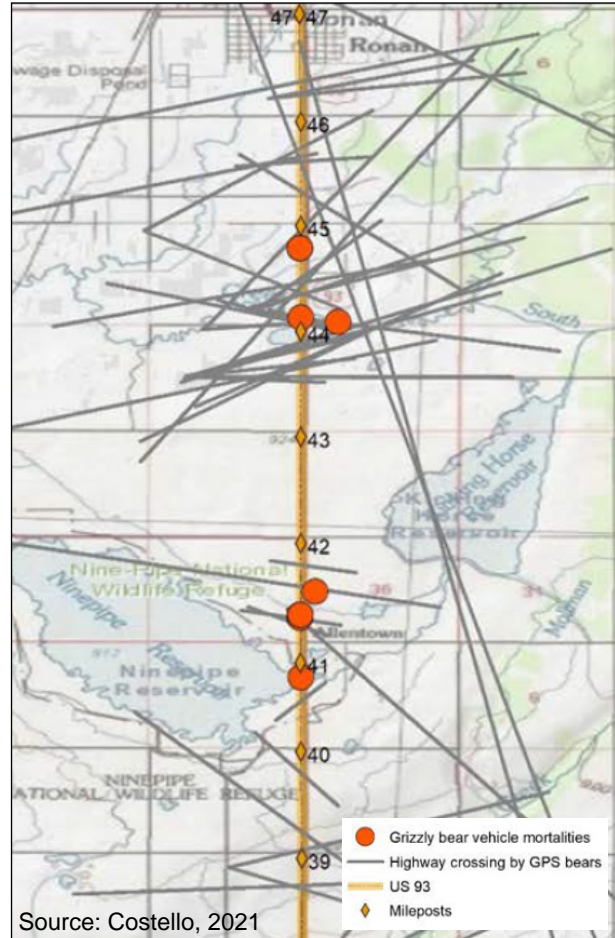
GRIZZLY BEARS

Grizzly bears are known to cross the highway in the Crow Creek vicinity, including the riparian corridor at RP 44.2 and adjacent areas. The SEIS noted that while its value is limited by the proximity of homes, lack of vegetative connectivity, and lack of dry land passage for wildlife underneath the US 93 crossing over Crow Creek, grizzly bears were suspected to use this corridor to travel from the Mission Mountains to the Moiese Hills west of Charlo. The SEIS reported that three grizzly bears had been struck and killed in the Ninepipe area, one of which was killed near the Ninepipe Reservoir and two in the Post Creek vicinity in 2001 and 2002.

Since 2008, Tribal biologists have continued monitoring bear movements and have documented hot spots for grizzly presence in the Ninepipe segment. Based on GPS collar data, high use has been documented in the Crow Creek riparian area east of US 93 and in the area between Ninepipe and Kicking Horse reservoirs on both sides of the highway. The CSKT have indicated other areas within the Ninepipe segment probably are not preferred crossing corridors, although bears may feed on carcasses in those areas.

A total of 45 highway crossings by nine different bears were documented in the Ninepipe vicinity from 2007 to 2019.¹¹ Although grizzlies were observed crossing throughout the Ninepipe vicinity, there appeared to be a concentration of crossings close to where US 93 crosses Crow Creek. Most of those crossings involved females with cubs (28 crossings by 3 individuals) or females with yearlings (11 crossings by 2 individual mothers). Timing of crossings was estimated as the midpoint between successive locations and most crossings appeared to occur at night, dawn, or dusk hours when traffic volumes are likely lower and when light conditions reduce motorists' visibility.

The US Highway 93 Evaro to Polson consultation between the USFWS and FHWA was re-initiated in 2012 because incidental take of grizzly bears that occurred under the 2005 Biological Opinion had been exceeded due to grizzly bear-vehicle collisions. Subsequently, the USFWS 2020 Biological Opinion noted that grizzly bear occurrences have been increasingly documented outside the NCDE recovery zone line, suggesting that the grizzly bear population is expanding since completion of the SEIS.¹²



This map shows documented vehicle-caused mortalities of grizzly bears for the 1998 to 2021 period as well as the approximate locations of highway crossings by GPS-collared grizzly bears within the Ninepipe vicinity for the 2007 to 2019 period.

From 2004 to 2019, there were 61 vehicle-caused grizzly bear mortalities in the NCDE including a 10-mile buffer. Within the NCDE, grizzly bear mortalities from vehicle collisions have increased significantly since 2000 and have notably accelerated since 2010.¹³ From 1990 to 2019 the number of mortalities or incidents that occurred per mile of road on US 93 was roughly 10 times higher within the Evaro to Polson corridor compared to other highways in the NCDE.¹⁴ The NCDE Monitoring Team and CSKT documented 11 grizzly bear mortalities during eight different incidents in the Ninepipe vicinity during 1998 to 2021. Two grizzly bear-vehicle collisions have occurred since 2020. One was hit by an ambulance in 2020 and one (a cub) was hit near the Post A irrigation canal.

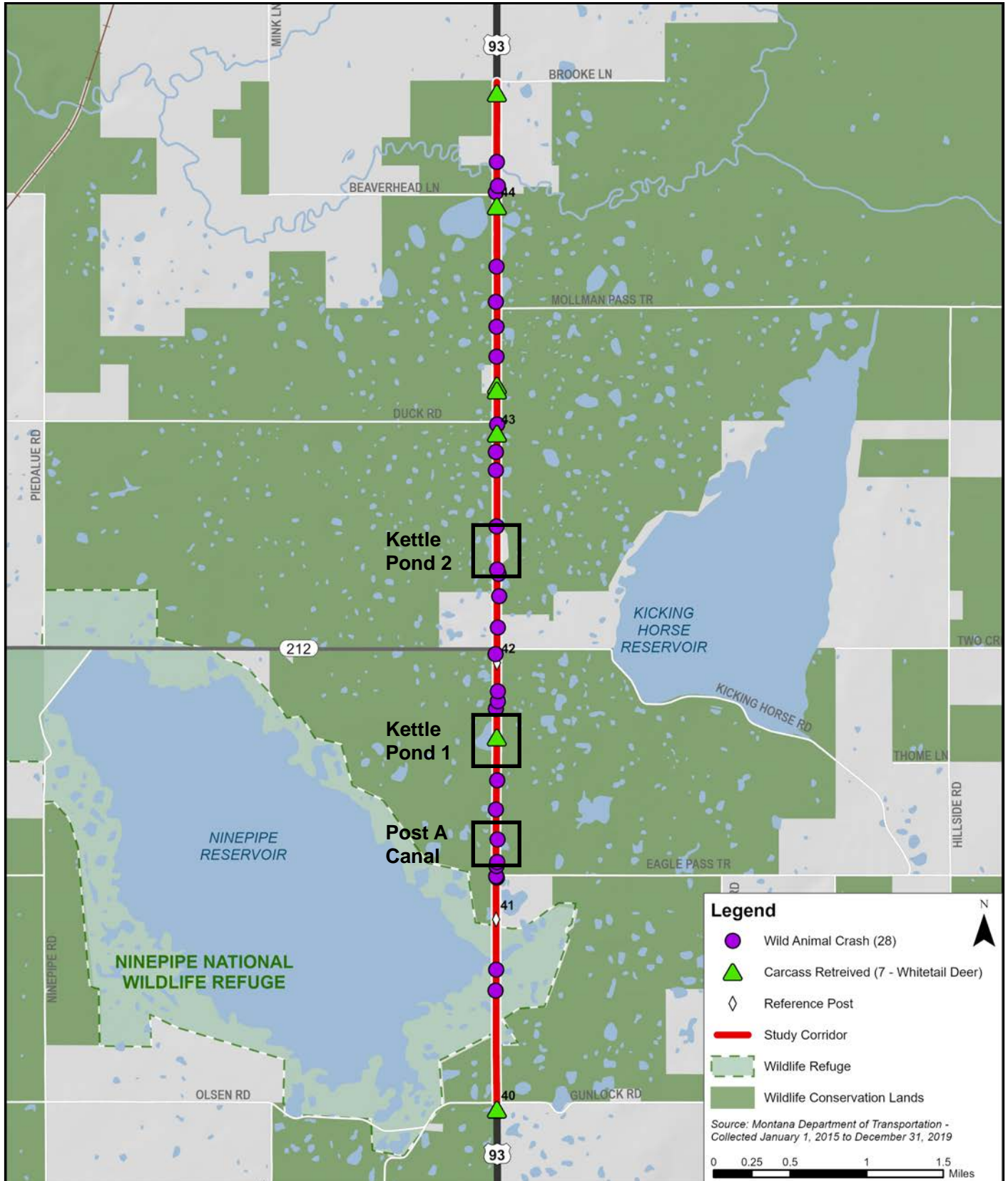


Figure 7: Wild Animal Crash and Carcass Data (2015-2019)

3.6. Cultural Resources

The Mission Valley holds exceptional cultural value to the CSKT. As noted in the 2008 SEIS, archaeological evidence and oral tradition suggest that Tribal groups have inhabited the region for 12,000 years, and their continuous interaction with the land has resulted in specific cultural values, traditions, practices, and resources that persist today. The Salish and Kootenai Cultural Committees, and the CSKT TPO are the primary repositories of traditional cultural knowledge and information, and the authoritative voice on the cultural significance of all these resources. Federal laws, regulations, executive orders, policies, and guidelines require transportation officials to identify, evaluate, and protect cultural resources.

The cultural resources investigation conducted for this feasibility study identified three previously identified resources within the Ninepipe segment of US 93, including two vernacular resources and one ethnographic resource. Vernacular resources include properties that are listed or eligible for listing on the National Register of Historic Places (NRHP) based on age, significance, and integrity. Ethnographic cultural resources include plants and animals that have special cultural values as well as traditional cultural places such as archaeological, sacred, and cultural sites, features, and trails, and CSKT living cultural landscapes (including camas fields, streams, forests, prairies, and wetlands).

Vernacular Resources

Flathead Indian Irrigation Project (FIIP) (24LA0091): The FIIP is a large and complex system that contains thousands of associated structures and over 1,300 miles of canals. US 93 crosses or parallels multiple primary and lateral canals of the FIIP. The only site number and site form for the FIIP does not document the canal features in the vicinity of Ninepipe segment.

Stagecoach Route (No Site Number): The 2008 SEIS discussed a historic stagecoach route present within the Ninepipe segment that roughly follows the US 93 corridor through the Mission Valley. The route, currently visible as a dirt road, follows the southwest edge of the Ninepipe Reservoir before crossing US 93 and continuing in a northeast direction through USFWS management lands. Portions of the old road and the remains of an

old collapsed wooden bridge are still visible in the Ninepipe area. A formal site number has not been issued for the route. According to the SEIS, the property was determined eligible for listing on the NRHP under an agreement between MDT and the Montana State Historic Preservation Office (SHPO), however, no record of this agreement was identified during the 2021 records search.

Ethnographic Resources

Ninepipe Cultural Property (SKP-LA-284):

The Ninepipe cultural site encompasses the entire Ninepipe segment adjacent to US 93. It is documented by the CSKT TPO as a traditional cultural property due to its unique qualities as an environmentally rich area of kettle lakes and glacial wetlands¹⁵. The site covers an area centered on US 93 extending from the Crow Creek crossing south nearly 5 miles to the southern end of Ninepipe Reservoir. The site area encompasses innumerable small kettle lakes, streams, and Ninepipe and Kicking Horse Reservoirs. The Mollman Pass Trail is located near the northern portion of the site. The site offers habitat to a variety of large and small mammals, reptiles, birds, native fish, and an abundance of economic cultural plants. The area was also used as a recreational site by tribal members for horse racing and informal family gatherings.



Source: Visit Montana

The Ninepipe segment is located within the Flathead Indian Reservation which is home to three tribes, the Bitterroot Salish, Upper Pend d'Oreille, and the Kootenai. Several historic and cultural sites exist within and near the study corridor.

3.7. Visual Landscape

In addition to holding significant cultural, historical, and recreational value, the Ninepipe area is also valued for its visual landscape.

The US 93 Evaro to Polson FEIS describes the Ninepipe segment and its immediate surroundings as having a distinct visual character and that is “outstanding aesthetically, especially in the undeveloped agricultural and wildlife management areas.” The 2008 SEIS notes that the Ninepipe core pothole area is considered a visually sensitive resource because of its uniqueness and vividness. The density of ponds in this area reduces the vernacular character elements to a more irregular grid of county roads without the presence of farms as an indicator of human activity on the land. The ground surface is permeated with ponds, which gives it the appearance of being less solid than the surrounding landscape. The visual character of the ponds with their ovoid forms and curvilinear edges is in distinct contrast with the straight lines of the highway. The riparian vegetation also occurs in clusters instead of linear ribbons, accentuating the highway’s visual contrast with its surroundings. The Mission Mountains, along the east side of the valley, form the most visually prominent large-scale landscape feature viewed from the study corridor. The movement of vehicles along US 93 adds a dynamic visual element that also contrasts with the typically static character of the surrounding visual landscape.



Source: Chuck Haney/Danita Delimont

The Ninepipe area is highly valued for its landscape and visual quality. The Mission Mountains, wetlands, and highway all contribute to the visual character of the landscape.

3.8. Geology and Soils

An understanding of geological, soil, and groundwater conditions assists in determining if constructability challenges exist within the Ninepipe segment related to slope stability, liquefaction risk from seismic activity, settlement issues, and artesian conditions. On MDT’s US 93-Post Creek Hill project immediately south of the Ninepipe segment, MDT encountered artesian groundwater conditions and other challenges associated with soft soils. These conditions created difficulties during fieldwork and design to achieve acceptable structural performance under the seismic design event.

Soils

Geologic units within the vicinity of the study corridor include shallow alluvium, glacial till, and coarse- and fine-grained lake deposits. The SEIS noted that depth to bedrock varies from 200 to 300 feet, with soils generally composed of sands and gravels overlain by coarse- and fine-grained lake deposits (generally gravels, silts, and clays), which are further overlain in some locations by shallow alluvium (mostly sands and gravels).

At the time of the SEIS, deep sands and gravels were assumed to be approximately 100 feet or less in thickness beneath the study corridor, and the overlying lake sediments were assumed to be approximately 100 feet or more in thickness. Shallow alluvium was noted to occur from the US 93/MT 212 intersection north to the end of the study corridor. Between this location, lake sediments were noted immediately beneath the surface soils, with a thickness of approximately 50 feet.

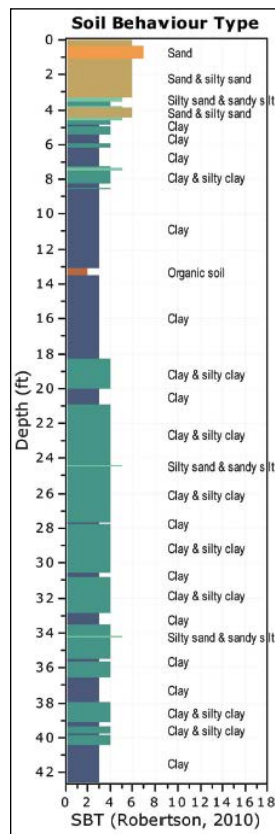
In general, testing conducted in 2021 encountered similar soils to those described in the SEIS, consisting primarily of relatively soft clays, silts, and sands. Dense bearing layers were encountered in seven of the eight structure-related soundings at depths ranging from 50 to 80 feet, with the depth increasing as the project extends north towards Crow Creek. North of Crow Creek, a dense bearing stratum was not encountered to the termination depth of 160 feet.

Seismic Risk and Liquefaction

The corridor is mapped as Earthquake Zone 2b, indicating earthquake motions equaling 20 to 30 percent of the acceleration of gravity have a 10 percent probability of occurring during any given 50-year period. Such motions are sufficiently strong to result in slight to moderate damage in ordinary well-built structures. The Mission fault is located along the west base of the Mission Mountain Range approximately 4.25 miles east of the US 93 corridor. The SEIS noted that certain soils including loose, saturated, sandy alluvial material are susceptible to liquefaction, indicating they can lose strength and temporarily behave like liquids during an earthquake. Roadways and structures supported by susceptible soils can sustain damage during an earthquake if not properly mitigated. The SEIS noted liquefaction could be a concern in alluvial deposits associated with Crow Creek. Analysis conducted in 2021 confirmed that minor liquefaction can be expected throughout the corridor.

Groundwater

The SEIS noted that the depth to groundwater varies throughout the corridor, with groundwater likely at shallow depths (less 100 feet) in the Crow Creek area and possibly elsewhere in the vicinity. The groundwater surface was calculated to be between 10 and 15 feet below the ground surface. Although groundwater levels were noted just below the ground surface where studied at the northern and southern ends of the corridor, evidence of artesian conditions was not observed.



Geotechnical analyses were performed to understand the soils present in the study area. These analyses will help inform future design efforts.

3.9. Economics

Economics are discussed in the SEIS to inform the public and decision makers about how a proposed project might affect people living or working in the project vicinity. Economic issues of concern include the overall economy, employment, personal income, and housing. The strength of the local economy, including population growth, job creation, unemployment, and the availability and cost of housing help establish the basis for discussing economic impacts.

The SEIS noted that economic considerations are relevant for the proposed improvements because a reconstruction project would bring capital resources into the project area, supporting the local economy and generating new employment. The proposed project would also affect and draw upon the local labor market during construction. However, construction might have a temporary adverse impact on local businesses due to travel delays or inconvenient access to adjacent properties. Conversely, improvements to traffic conditions could make it easier for potential customers to access businesses located within the project area which could improve the local economy.

The rural nature of the Ninepipe segment makes the local economy largely transportation dependent so highway improvements or alterations are a paramount issue for the local economy. Seasonal tourism has been and continues to be a major part of the local economy along US 93. The scenic attractions of the Ninepipe area make it a travel destination while other major attractions in the surrounding area such as Flathead Lake, Glacier National Park, and Big Mountain Ski Resort make US 93 an important regional tourism travel corridor. The economic analysis conducted for the SEIS found that a large percentage of sales in the project area was generated from travelers, especially during summer months.



Source: Google Earth

A few local businesses front US 93 within the study area, this business caters to the water recreationists, such as those visiting Flathead Lake.

3.10. Summary of Relevant Conditions

The following sections summarize key findings and conditions that have changed since the time of the 2008 SEIS. This information was used to support the feasibility analysis, including development of costs and identification of impacts and constructability challenges associated with proposed improvements to the US 93 corridor.

Traffic and Safety

- 2020 traffic volumes are similar to those documented for the year 2000 in the SEIS, with substantial variation from year to year.
- Peak summer traffic volumes are approximately 35 percent higher than those during an average day throughout the year.
- The corridor currently operates at LOS D, below recommended levels. The corridor is projected to continue to operate at LOS D or deteriorate to LOS E depending on future traffic growth.
- The existing highway facility is not well suited to accommodate non-motorists due to high speeds, high traffic volumes, and lack of dedicated facilities.
- Crash rates have increased in comparison to the SEIS findings, however, the severity of crashes has decreased.
- The most common crash type is wild animal crashes, followed by fixed object and rear-end.
- Six percent of crashes were considered severe and included two head on, two rear-end, and one roll over crash.

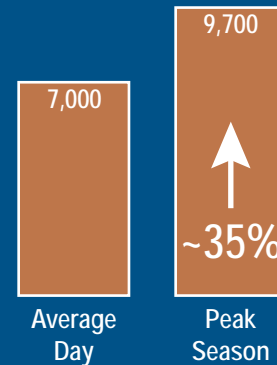
Land Use

- The majority of the study corridor is surrounded by public lands, which are managed to support and preserve wildlife and serve recreation purposes.
- Twelve private landowners own parcels adjacent to the study corridor.
- Approximately half of adjacent parcels are categorized as residential/agricultural properties. Most remaining parcels are commercial/industrial/institutional uses.
- The recommended right-of-way width along the corridor is 160 feet for the SEIS preferred alternative. Generally, this minimum width is available, with narrower areas near Eagle Pass Trail and Brooke Lane.

Wetlands

- Three new wetlands totaling approximately 0.09 acre were delineated.
- Of the 82 wetlands previously identified in the 2008 SEIS, minor changes were noted for 26 wetlands while boundaries for 56 wetlands remained unchanged (net increase of 0.573 acre).
- Three wetlands were reclassified from Category III to Category IV as a result of changes to the scoring methodology.
- No changes to preliminary USACE jurisdictional status were made to previously identified wetlands.

TRAFFIC VOLUMES



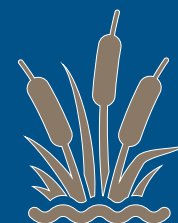
NO DEDICATED PEDESTRIAN OR BICYCLE FACILITIES



MOST COMMON CRASH TYPES
Wild animal, fixed object, rear-end

12 ADJACENT PRIVATE LANDOWNERS

& Several Public Lands Managed for Wildlife, Recreation, and Culture



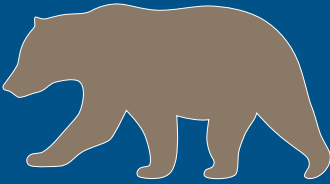
85 WETLANDS

Totaling **110.58** Acres



140 FEET
of Floodplain at
Ninepipe Reservoir

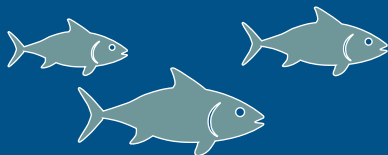
645 FEET
of Floodplain at
Crow Creek



GRIZZLY BEARS
are the only documented
Threatened and Endangered
Species in the Corridor



COMMONLY STRUCK SPECIES
in the CORE POTHOLE AREA:
Deer, birds/waterfowl, and turtles



AQUATIC HABITAT
Provided at Ninepipe Reservoir
and Crow Creek

Surface Waters and Floodplains

- US 93 crosses 6 surface water features within the study area, two have associated floodplains.
- Approximately 140 feet of US 93 crosses the 100-year floodplain of Ninepipe Reservoir (a reduction of 190 feet since the SEIS).
- Approximately 645 feet of US 93 crosses the 100-year floodplain of Crow Creek (an increase of 95 feet since the SEIS).
- Existing culverts at Crow Creek may be inadequate to convey high water flows.
- The SEIS found that the beneficial uses of Crow Creek are impaired due to habitat alteration, siltation, elevated water temperatures, and increased nutrients.
- Existing highway ditches intercept shallow valley-fill aquifers which are vulnerable to contamination from infiltrated runoff.

Wildlife

- Numerous birds occur within the Ninepipe area, including ducks and other waterfowl (the most abundant group), shorebirds, raptors, and passerine.
- The Ninepipe area supports a variety of mammals, including grizzly bears, deer, muskrats, badgers, beavers, skunks, raccoons, weasels, mink, river otters, squirrels, coyotes, fox, field mice, shrews, voles, and multiple bat species.
- Common reptile species include western terrestrial garter snakes, western painted turtle, and the western garter snake.
- Amphibians potentially occurring within the area include spotted frogs, long toed salamanders, pacific tree frogs, and western toads.
- The Ninepipe Reservoir and Crow Creek are the only waters within the study area known to provide aquatic habitat for fish. Post A Canal may provide fish passage when it's in operation.
- Documented occurrence has been recorded for two species of concern, including Forster's tern loon (with nesting reporting within 0.25 mile of the corridor) and bald eagle (with wintering individuals observed near RP 41.5).
- Deer cross throughout the US 93 corridor and are most represented in carcass data. For other species, concentrated wildlife movement occurs near the core pothole area from RP 39.4 to 44.1 and in the Crow Creek riparian corridor at RP 44.2. Large numbers of birds and turtles are struck within the Ninepipe segment, particularly near the core pothole area.
- Since completion of the 2008 SEIS, grizzly bear occurrences have been increasingly documented outside the NCDE recovery zone line, suggesting that the grizzly bear population is expanding. Grizzly bears are active in the Ninepipe segment, with high use documented in the Crow Creek riparian area east of US 93 and in the area between Ninepipe and Kicking Horse reservoirs on both sides of the highway. Grizzly bear mortalities from vehicle collisions have increased significantly since 2000 and have notably accelerated since 2010.

Cultural Resources

- Three previously identified cultural resources occur within Ninepipe segment of the US 93 corridor.
- The Flathead Indian Irrigation Project (24LA0091) includes multiple canals crossing or paralleling US 93.
- The Stagecoach Route (No Site Number) follows the southwest edge of the Ninepipe Reservoir before crossing US 93 and continuing in a northeast direction through USFWS management lands.
- The Ninepipe Cultural Property (SKP-LA-284) encompasses the entire Ninepipe segment adjacent to US 93 and is considered a traditional cultural property due to its unique qualities as an environmentally rich area of kettle lakes and glacial wetlands.
- The entire setting, including wildlife and wetlands, is highly valued from a cultural perspective.

Visual Landscape

- The ovoid, curvilinear form of the ponds and riparian vegetation in the Ninepipe area distinctly contrast the straight lines of the highway.
- The Mission Mountains are the most visually prominent landscape feature viewed from the corridor.
- The traffic along US 93 adds a dynamic visual element that contrasts the static character of the surrounding landscape.

Geology and Soils

- Soils in the study area consist primarily of relatively soft clays, silts, and sands. Dense bearing layers were encountered at depths ranging from 50 to 80 feet, with the depth increasing as the project extends north towards Crow Creek. North of Crow Creek, a dense bearing stratum was not encountered to the termination depth of 160 feet.
- Minor liquefaction can be expected throughout the corridor.
- The groundwater surface was calculated to be between 10 and 15 feet below the ground surface. Evidence of artesian conditions was not observed.

Economics

- The rural nature of the Ninepipe area makes the local economy largely transportation dependent.
- Seasonal tourism has been and continues to be a major part of the local economy along US 93.
- A large percentage of sales in the project area is generated from travelers, especially during summer months.



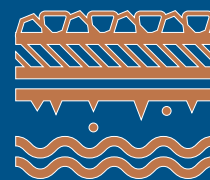
3 CULTURAL RESOURCES

Stagecoach Route,
Ninepipe Cultural Property, and
Flathead Indian Irrigation Project



OUTSTANDING VISUAL QUALITY

Characterized by the Mission
Mountains, core pothole area,
and vehicles on US 93



Soft Soils,
Minor Potential
for Liquefaction,
Shallow
Groundwater

ECONOMY
is highly
transportation-
dependent and
reliant on
summer tourism



**NINEPIPE
CORRIDOR**



**FEASIBILITY
STUDY**

CHAPTER 4: OPTION IDENTIFICATION AND SCREENING PROCESS

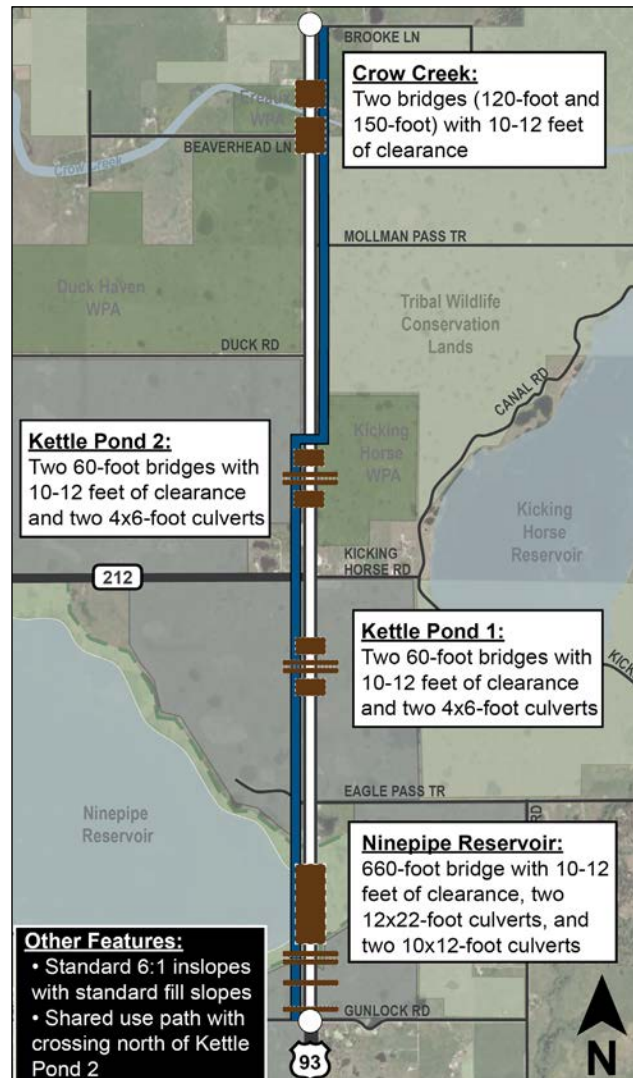
This chapter documents the process used to evaluate the SEIS preferred alternative and modified reconstruction options to determine which options would be feasible to implement and to understand the tradeoffs between resource impacts, overall benefits, and project costs. The screening process was developed to identify a preferred corridor option comprising the most feasible, beneficial, and cost-effective improvements for the corridor. Additional information about structural and hydraulic analyses is provided in **Appendix 3**, supporting information about wetland impacts is provided in **Appendix 4**, and detailed information about the screening process is provided in **Appendix 5**.

4.1. Development of Reconstruction Options

During development of the SEIS, the project proponents and stakeholders agreed that protection of the sensitive natural resources within the Ninepipe segment was paramount. It was determined that increasing the capacity of the Ninepipe corridor would adversely impact the natural resources in the corridor, whereas the preferred alternative, a two-lane configuration with widened shoulders, would not result in significant impacts to natural resources, with implementation of proposed mitigation. In addition, the project proponents endorsed adding a separated bicycle and pedestrian path to the project. The *Memorandum of Agreement (MOA) US 93 Evaro to Polson*, referred to as the US 93 Corridor MOA, states that MDT, CSKT, and FHWA collectively agreed to prepare an SEIS to evaluate alternatives for the Ninepipe/Ronan segment and continue to work cooperatively to achieve physical construction of the improvements identified in the 1996 *FEIS and Section 4(f) Evaluation* and subsequent SEIS.

Due to constructability challenges encountered in other segments of the US 93 Evaro to Polson corridor and the length of time elapsed since completion of the SEIS, MDT initiated this feasibility study to evaluate if the SEIS preferred alternative identified is viable in terms of impacts, costs, and constructability considerations. Based on a comprehensive review of background documentation, field conditions, and site constraints, it was determined that no insurmountable barriers to implementation are anticipated in the corridor and that the SEIS preferred alternative is generally feasible to implement with adequate funding. Through this evaluation, it was discovered that the availability of wildlife tracking data is much more abundant, and research on wildlife accommodations is much more advanced than what was available when the SEIS was completed. Some changes to hydraulic conditions, wetland location and function, and geotechnical conditions were also discovered. These changed conditions prompted a desire to investigate the feasibility of modified reconstruction options which may reduce impacts and better serve the needs of the corridor in a manner that is potentially more cost effective and easier to implement.

Given the agreement in the US 93 Corridor MOA to complete construction of identified improvements and the finding that the SEIS preferred alternative is likely feasible to implement, it was determined that choosing not to reconstruct the corridor would contradict the MOA. For these reasons, the SEIS preferred alternative was established as the baseline configuration to compare to all modified reconstruction options in terms of feasibility and impacts. Similarly, it was determined that the roadway configuration (two 12-foot lanes with widened 8-foot shoulders) and the provision of a shared use path (SUP) would be incorporated in any modified reconstruction options.



The 2008 SEIS Preferred Alternative for the Ninepipe segment was used as the baseline configuration for comparison purposes.

4.2. Evaluation Process

Development and evaluation of modified reconstruction options involved a multi-step process, as presented in **Figure 8**. The first step involved an analysis of typical section and SUP options to establish initial assumptions for reconstruction of the corridor. The typical section options maintained the roadway configuration identified in the SEIS but incorporated changes to the inslopes and fill slopes to reduce impacts to natural resources. The SUP options maintained the provision of a SUP throughout the corridor, as dictated by the SEIS, but considered alternate alignments and crossing locations. A qualitative evaluation was conducted to assess two typical sections and three SUP options. The evaluation considered the relative benefits and disadvantages of each option in five categories:

- **Transportation:** Operations and safety for vehicles and non-motorists.
- **Ecological Environment:** Impacts to wetlands and surface waters.
- **Fish and Wildlife:** Accommodations and habitat impacts for fish and wildlife.
- **Human Environment:** Impacts to adjacent properties, cultural resources, and recreational areas.
- **Constructability:** Ease of construction and geotechnical feasibility.

Based on the comparative performance of each option, preferred configurations were selected for further evaluation. The typical section and SUP evaluations are provided in **Sections 4.3** and **4.4**, respectively.

The next step included development of corridor-wide options to comprehensively address the combination of roadway typical section, SUP alignment, and wildlife crossings. In addition to the baseline option, two modified corridor options were developed for consideration based on newly available information. All three options were then evaluated through a comprehensive screening process to determine overall feasibility and understand the tradeoffs and benefits between each option.

The corridor options and screening process are described in **Section 4.5**. The screening categories for this process included the five categories listed above as well as a cost category. A more detailed description of how the screening categories were applied and analyzed is contained in **Section 4.6**.

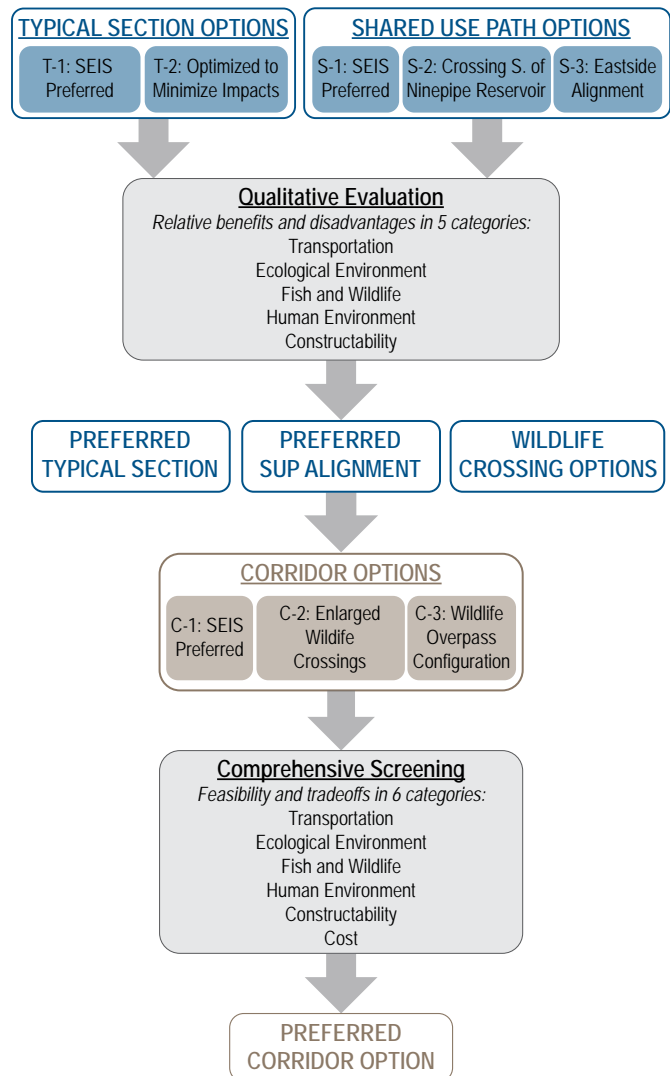


Figure 8: Evaluation Process

4.3. Typical Section Options and Evaluation

Two typical section options were identified for the corridor. The options included travel lane configurations, shoulder widths, slopes, and rumble strips. Each option consisted of an undivided two-lane roadway with one travel lane in each direction. Option T-1 consisted of the preferred typical section presented in the SEIS. Option T-2 was developed to minimize impacts to adjacent resources and consisted of steeper fill slopes throughout the corridor. Both options included channelization and left-turn lanes at the Olson Road/Gunlock Road, Eagle Pass Trail, MT 212/Kicking Horse Road, Mollman Pass Trail, Beaverhead Lane, and Brooke Lane intersections, as described in the SEIS. **Figure 9** shows an example typical section illustrating cross sectional elements.

- **T-1: SEIS Preferred:** Two 12-foot lanes with widened 8-foot shoulders, standard inslopes (6:1) and fill slopes (variable, MDT standard) with clear zone requirements met within the shoulder and inslope widths, standard ditch slopes (20:1), and centerline/shoulder rumble strips.
- **T-2: Optimized to Minimize Impacts:** Two 12-foot lanes with widened 8-foot shoulders, standard inslopes (6:1) with clear zone requirements met within the shoulder and inslope widths, steepened 3:1 fill slopes generally throughout the corridor, 2:1 inslopes and guardrail and/or retaining walls in select locations to minimize resource impacts, standard ditch slopes (20:1), and centerline/shoulder rumble strips.

A qualitative evaluation was conducted to assess the typical section options according to the five screening categories. Evaluation results are discussed in the following sections.

Transportation

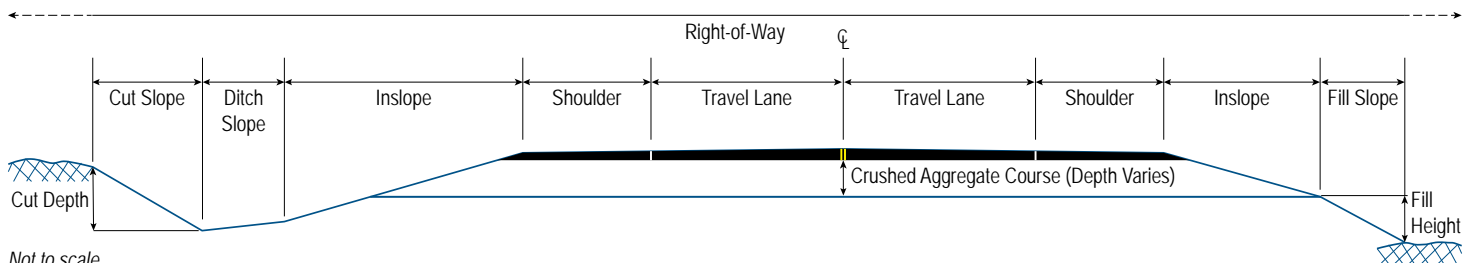
Both typical sections would provide two 12-foot lanes and all would operate at LOS D to E under projected conditions. Both options would also include widened 8-foot shoulders and shoulder/centerline rumble strips, which would provide additional recovery area and potentially reduce head-on, run-off-the-road, and rollover crash types compared to the existing roadway. In combination with the widened shoulder, standard 6:1 surfacing inslopes included with both options would provide the required clear zone width. There is likely to be no measurable difference to transportation conditions between the two options.

Ecological Environment

Under Options T-1 and T-2, widened shoulders and standard surfacing inslopes would impact wetlands adjacent to the roadway, with fewer impacts resulting from Option T-2 due to steepened fill slopes. Both construction options would result in increased sediment delivery and turbidity in streams from construction activities and additional impervious roadway area, increasing the surface area for pollutants to be deposited and potentially impacting water quality. Overall, option T-2 would have slightly lower impacts to the ecological environment due to the narrower typical section.

Fish and Wildlife

Under Options T-1 and T-2, wider typical sections would create a slightly longer crossing distance for wildlife and increased paved area compared to existing conditions, thereby reducing wildlife habitat. However fewer adverse impacts would result from Option T-2 due to steepened fill slopes.



*Not to scale
 Note: Planning-level assumptions are documented for the purpose of feasibility study evaluations.
 Design details would be determined in the future should a project advance from this study.*

Figure 9: Example Typical Section

Human Environment

Option T-1 would impact a greater area due to the widened typical section and standard fill slopes. T-2 would have a narrower footprint due to steepened fill slopes.

Constructability

Options T-1 and T-2 would both be feasible to construct, although they may require retaining walls or slope stabilization at some locations to accommodate steeper slopes and reduce erosion.

Typical Section Evaluation Results

Typical Section T-1 was retained for evaluation of the SEIS preferred alternative. Typical Section T-2 was selected as a baseline assumption for all other corridor options because it would incorporate the safety benefits of widened shoulders while also minimizing impacts to the ecological and human environment including adjacent wetlands, habitat, and right-of-way acquisition.

4.4. Shared Use Path Options and Evaluation

Three SUP options were evaluated for the Ninepipe segment. Option S-1 represents the SEIS preferred alternative where the path would be on an independent alignment within the highway right-of-way. The path was originally proposed on the west side of US 93 from south of the Ninepipe Reservoir to approximately Kettle Pond 2 where a crossing was proposed; on the east side until Ronan; and finally on the west side to the end of the Ninepipe/Ronan project corridor as defined in the SEIS. The highway crossings in S-1 were proposed to be achieved with undercrossing structures at locations where topography and highway vertical alignment provide sufficient clearances.

Option S-2 would shift the crossing within the Ninepipe segment to just south of Ninepipe Reservoir where the grade is favorable for an underpass. This shift would allow the east side path alignment to follow the old roadbed right-of-way to minimize wetland and right-of-way impacts around the kettle ponds and Mission Mountains Viewpoint. A pedestrian crossing at Eagle Pass Trail could be considered to enable access to the Ninepipes Picnic Pullout and Interpretive Nature Trail west of US 93.

Option S-3 proposes construction of the path entirely on the east side of US 93 to avoid impacts within the core pothole area and reduce the need for an underpass structure. Option S-3 would only be appropriate if the SUP alignment in the MDT US 93-Post Creek project were to be modified. Images of each of the SUP configurations are provided in **Figure 10** on the following page.

- **S-1: SEIS Preferred:** Westside SUP alignment south of Kettle Pond 2, pedestrian underpass at Kettle Pond 2, and SUP continuing on the east side of US 93 north of Kettle Pond 2.
- **S-2: Crossing South of Ninepipe Reservoir:** Westside SUP alignment south of Ninepipe Reservoir, pedestrian underpass at Ninepipe Reservoir, and SUP continuing on the east side of US 93 north of Ninepipe Reservoir, with consideration for pedestrian crossing at Eagle Pass Trail.
- **S-3: Eastside Alignment:** Eastside SUP alignment throughout corridor with no underpass (assuming eastside alignment incorporated at the north end of the MDT US 93-Post Creek project).

A qualitative evaluation was conducted to assess the three SUP options according to the five screening categories. Evaluation results are discussed in the following sections.

Transportation

Options S-1, S-2, and S-3 would all provide a new SUP adjacent to the highway. Options S-2 and S-3 would offer increased separation from the highway at the kettle ponds and the Mission Mountains Viewpoint compared to Option S-1. Grade-separated highway crossings would be incorporated in Options S-1 and S-2. Overall, Options S-2 and S-3 would offer the greatest pedestrian and bicyclist comfort due to increased separation from the highway.

Ecological Environment

Construction of Options S-1, S-2, and S-3 would all impact wetlands adjacent to the roadway, with Options S-2 and S-3 minimizing impacts by routing the alignment around the kettle ponds.

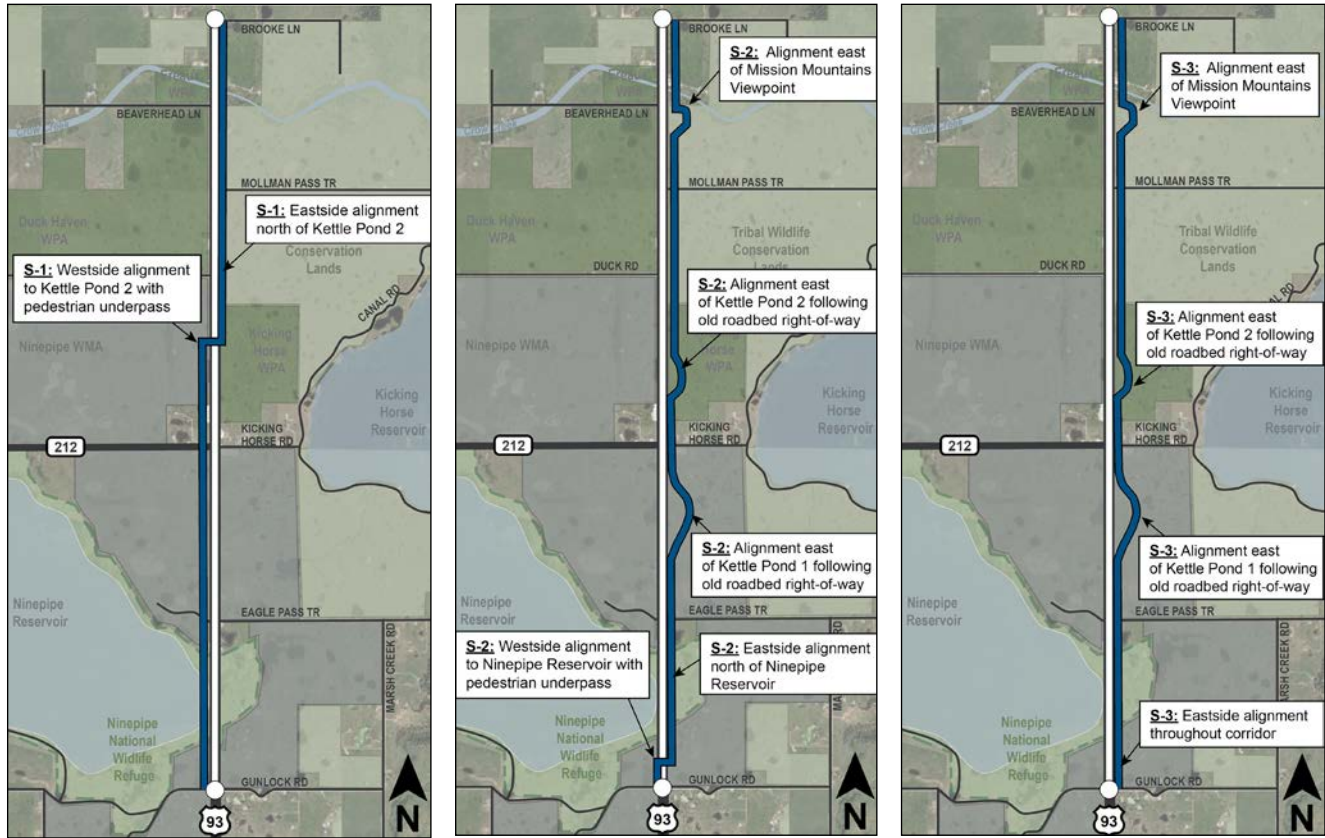


Figure 10: SUP Configurations (S-1, S-2, S-3)

Fish and Wildlife

Under Options S-1, S-2, and S-3, the proximity of the SUP and non-motorists to wetland and habitat areas could adversely impact nesting birds and other wildlife. Routing the SUP around the kettle ponds in Options S-2 and S-3 may increase human-wildlife conflicts and may introduce a new barrier if fencing is extended around the path. Option S-1 would minimize adverse effects to wildlife.

Human Environment

Construction of Options S-1, S-2, and S-3 may require some right-of-way acquisition, however portions of the S-2 and S-3 alignments around the kettle ponds and Mission Mountains Viewpoint would generally fall within existing right-of-way. Potential effects to the historic stagecoach route resulting from Options S-2 and S-3 would require additional evaluation in future environmental documentation.

Constructability

Options S-1, S-2, and S-3 would all be feasible to construct, although the geotechnical feasibility of underpasses and associated groundwater levels would need to be evaluated during project development. Coordination would be needed with the MDT US 93-Post Creek project which currently has incorporated a westside SUP alignment extending approximately to Gunlock Road.

SUP Evaluation Results

SUP Option S-1 was retained for evaluation of the SEIS preferred alternative. SUP Option S-2 was selected as a baseline assumption for all other corridor options because it would provide the greatest pedestrian and bicycle comfort while minimizing impacts and offering a logical connection to the SUP alignment currently defined for the MDT US 93-Post Creek project. SUP Option S-3 was eliminated based on its failure to connect to the MDT US 93-Post Creek project.

4.5. Corridor Options

Three corridor-wide options were evaluated to comprehensively address the combination of roadway typical section, SUP alignment, and wildlife crossings. Planning-level alignments and roadway profiles were developed for each of the proposed configurations to assist with preparation of preliminary cost estimates and identification and quantification of benefits and impacts.

Option C-1 includes the typical section (T-1), SUP (S-1), and structures recommended in the SEIS preferred alternative. Options C-2 and C-3 were developed for this feasibility study to improve transportation system performance and improve wildlife accommodations. Both options include typical section and SUP options identified previously (T-2 and S-2). Option C-2 generally includes a single, longer bridge structure spanning the entire water body at each crossing location, compared to the SEIS preferred alternative that would use multiple structures to convey stream channels. To encourage greater use by wildlife, the longer structures also assumed 15 feet of vertical clearance. Option C-3 assumed that if a wildlife overpass were to be constructed in the corridor, smaller structures may be acceptable at other nearby crossing locations. In addition to the provision of an overpass, Option C-3 generally provides the minimum bridge length needed to satisfy hydraulic and wildlife crossing requirements at each location. The minimum bridge dimensions were identified to minimize impacts at each location while still providing adequate hydraulic conveyance and wildlife passage. At some locations, deviations from the minimum hydraulic conveyance configurations were pursued due to specific wildlife crossing needs. Key features associated with each of the three corridor options are described and illustrated in **Figures 11** through **13**.

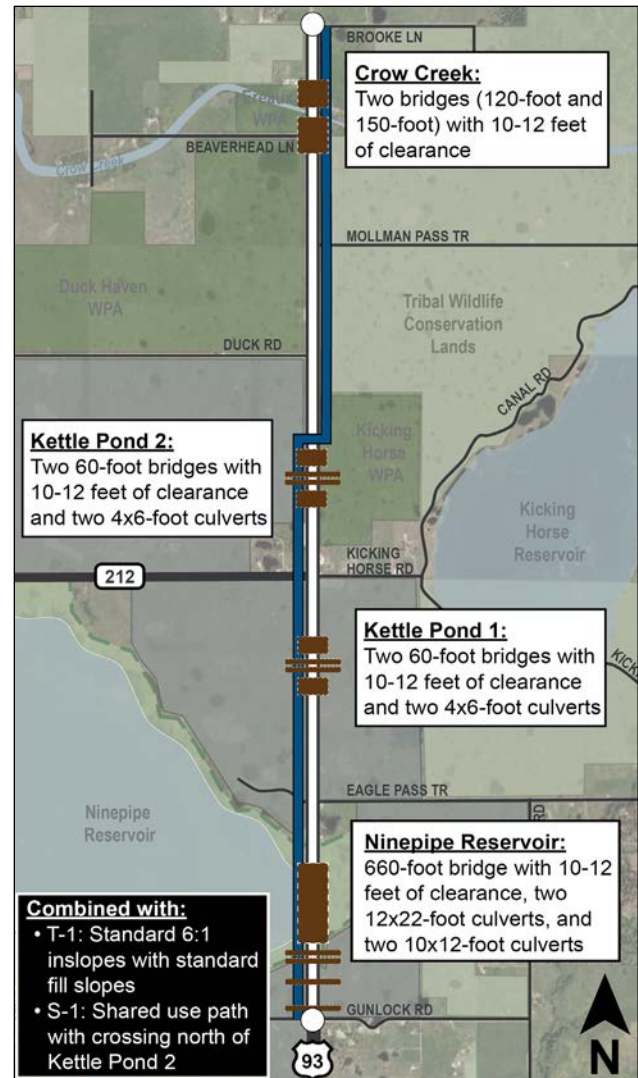


Figure 11: C-1 (SEIS Preferred)

- **Typical Section:** Standard 6:1 inslopes with standard fill slopes
- **Shared Use Path:** SUP with crossing north of Kettle Pond 2
- **Ninepipe Reservoir:** Single 660-foot bridge with 10 to 12 feet of vertical clearance, two 12x22-foot culverts, and two 10x12-foot culverts
- **Kettle Pond 1:** Two 60-foot bridges with 10 to 12 feet of vertical clearance and two 4x6-foot culverts
- **Kettle Pond 2:** Two 60-foot bridges with 10 to 12 feet of vertical clearance and two 4x6-foot culverts
- **Crow Creek:** Two bridges (120-foot and 150-foot) with 10 to 12 feet of vertical clearance

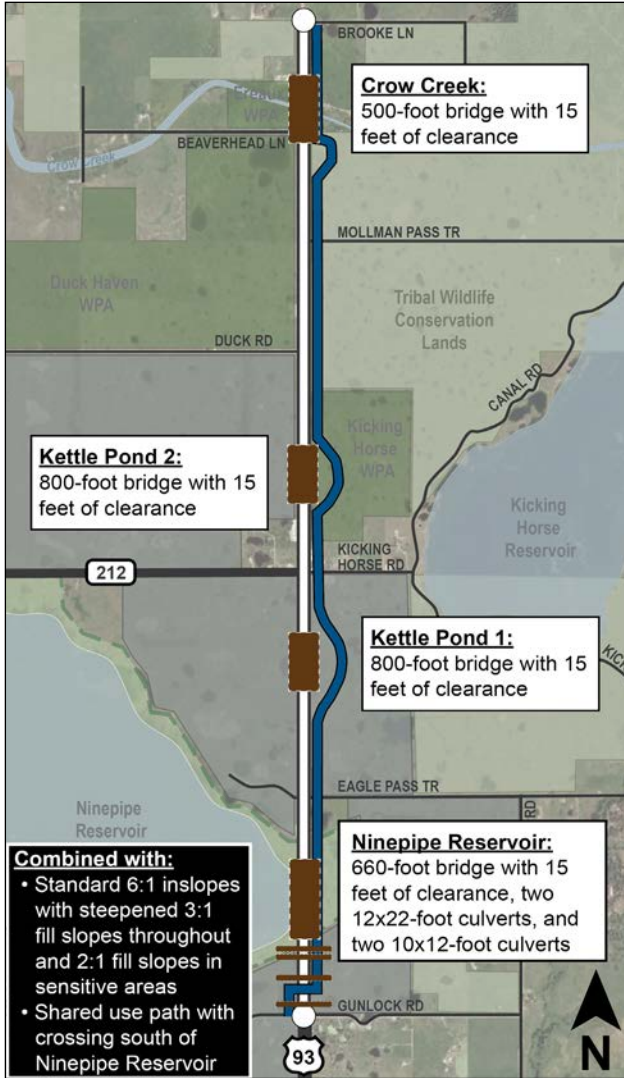


Figure 12: C-2 (Enlarged Wildlife Crossing Structures)

- **Typical Section:** Standard 6:1 inslopes with steepened 3:1 fill slopes throughout and 2:1 fill slopes in sensitive areas
- **Shared Use Path:** SUP with crossing south of Ninepipe Reservoir
- **Ninepipe Reservoir:** Single 660-foot bridge with 15 feet of vertical clearance, two 12x22-foot culverts, and two 10x12-foot culverts
- **Kettle Pond 1:** Single 800-foot bridge with 15 feet of vertical clearance
- **Kettle Pond 2:** Single 800-foot bridge with 15 feet of vertical clearance
- **Crow Creek:** Single 500-foot bridge with 15 feet of vertical clearance

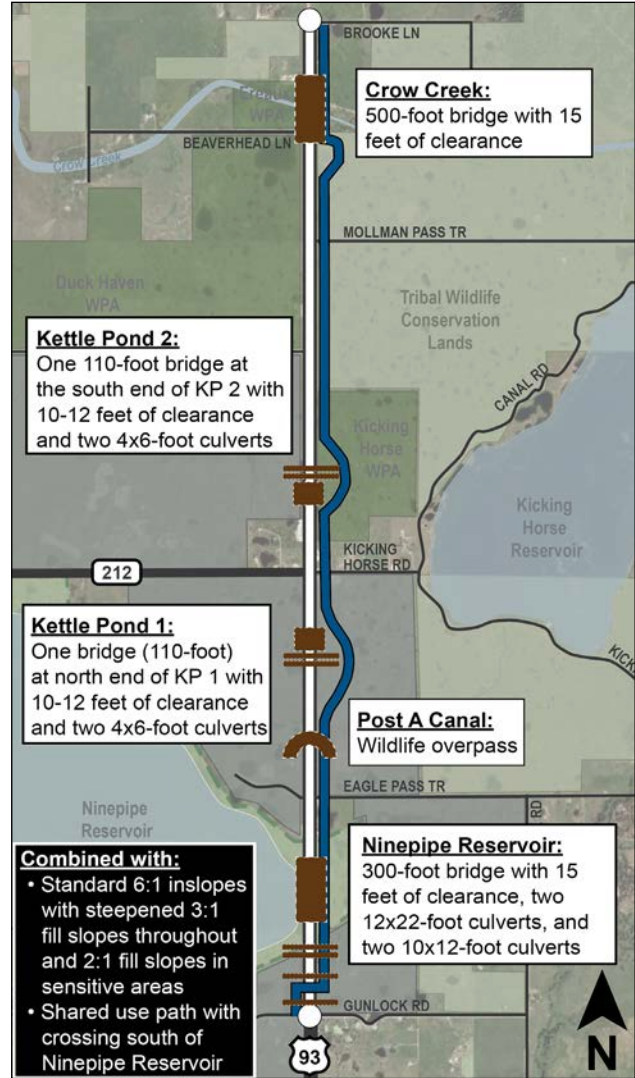


Figure 13: C-3 (Wildlife Overpass Configuration)

- **Typical Section:** Standard 6:1 inslopes with steepened 3:1 fill slopes throughout and 2:1 fill slopes in sensitive areas
- **Shared Use Path:** SUP with crossing south of Ninepipe Reservoir
- **Ninepipe Reservoir:** Single 300-foot bridge with 15 feet of vertical clearance, two 12x22-foot culverts, and two 10x12-foot culverts
- **Post A Canal:** Wildlife overpass
- **Kettle Pond 1:** Single 110-foot bridge with 10 to 12 feet of vertical clearance and two 4x6-foot culverts
- **Kettle Pond 2:** Single 110-foot bridge with 10 to 12 feet of vertical clearance and two 4x6-foot culverts
- **Crow Creek:** Single 500-foot bridge with 15 feet of vertical clearance

4.6. Corridor Screening Process

A screening process was used to determine which corridor options would be feasible to implement and to understand the trade-offs between resource impacts, overall benefits, and project costs. Corridor options include typical section and SUP configurations with varying wildlife crossing treatments. These options were evaluated numerically according to their performance under six screening criteria. Starting from the five general categories considered for the initial evaluation, the screening criteria were developed in more detail with the addition of a cost category. A numeric rating system was used to provide a comparison of options. The rating scale ranged from one to five, where a score of one (1) indicates very poor performance and/or the greatest negative impacts and a score of five (5) indicates very good performance and/or the greatest overall benefits. A total of 20 subcategories were defined under the six screening criteria, with a total of 5 possible points per subcategory and a total possible score of 100 for each option. Ultimately, the goal was to identify a preferred corridor option comprising the most feasible, beneficial, and cost-effective improvements for the corridor.

RATING SCALE

1	Very poor performance, substantial adverse impacts, or full barriers to implementation
2	Poor performance, some adverse impacts, or potential barriers to implementation
3	Fair or unchanged performance, no net impacts, or no net benefits
4	Good performance, some benefits, or feasible to implement
5	Very good performance, substantial benefits, or no anticipated barriers to implementation

4.6.1. Screening Criteria

All previously completed work was used to update known conditions and determine primary project influencers. Based on this information, the following screening criteria represent key factors with the largest influence on the feasibility and reasonableness of proposed options. The options were evaluated based on the six screening criteria and associated qualitative and quantitative components listed in **Table 6**. The criteria are described in greater detail in subsequent sections.

Screening Criterion 1: Transportation

The SEIS determined reconstruction of the corridor is needed to improve safety, provide multimodal accommodations, and to ensure that the corridor can operate efficiently under current and projected traffic conditions. **Table 7** provides a summary of the findings and scores for each corridor option under each of the transportation sub-criteria.



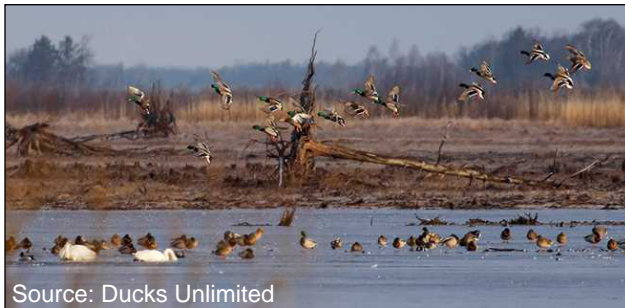
Screening Criterion 2: Ecological Environment

US 93 crosses several wetlands, streams, irrigation systems, other surface waters, and their associated floodplains throughout the Ninepipe segment. The most prominent water resources crossed by US 93 include Ninepipe Reservoir, Kettle Pond 1, Kettle Pond 2, and Crow Creek. Screening Criterion 2 considered the ability of each option to support hydraulic conveyance and connectivity and to minimize impacts to wetlands, water bodies, and floodplains. **Table 8** provides a summary of the findings and scores for each corridor option under each of the ecological environment sub-criteria.



Screening Criterion 3: Fish and Wildlife

The US 93 Ninepipe corridor provides habitat for numerous wildlife species including a variety of fish, turtles, birds, deer, various small to large mammals, and grizzly bears which are federally listed as Threatened. Screening Criterion 3 considered the ability of each option to accommodate safe passage of aquatic and terrestrial species, reduce wildlife mortality, provide habitat connectivity, and support federally listed species. **Table 9** provides a summary of the findings and support discussed for each corridor option under each of the fish and wildlife sub-criteria. Scores for each sub-criteria as well as a subtotal score for the fish and wildlife screening criteria are also provided.



Source: Ducks Unlimited



Screening Criterion 4: Human Environment

The US 93 Ninepipe segment traverses a primarily rural area dominated by low-density residential, cultural, and agricultural uses, although the Ninepipe NWR, multiple WMAs, WPAs, and some highway/tourist-oriented commercial properties are also located in the corridor. Screening Criterion 4 considered the ability of each option to minimize impacts to cultural and recreational resources, visual characteristics of the corridor, and adjacent properties. **Table 10** provides a summary of the findings and scores for each corridor option under each of the human environment sub-criteria.



Source: Visit Montana



Screening Criterion 5: Constructability

Improvements to US 93 within the Ninepipe segment will need to consider geotechnical and general construction feasibility, impacts to the traveling public during construction, as well as regulatory construction requirements. Screening Criterion 5 considered multiple geotechnical factors along with the construction feasibility, impacts, and requirements associated with each option. **Table 11** provides a summary of the findings and scores for each corridor option under each of the constructability sub-criteria.



Screening Criterion 6: Cost

Cost is an important component of the feasibility evaluation for improvements within the Ninepipe segment. Funding may come from a variety of sources including federal, state, or local sources. Screening Criterion 6 considered the cost of improvements, maintenance needs and costs, benefit-cost ratio (BCR), general cost effectiveness, and relative fundability of each option. **Table 12** provides a summary of the findings and scores for each corridor option under each of the cost sub-criteria.

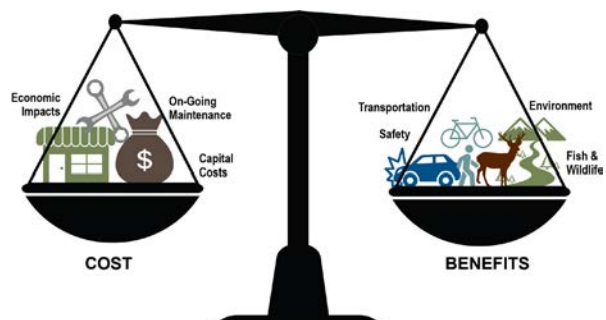


Table 6: Screening Criteria

Screening Criteria		Sub-Criteria		Description/Components
1	Transportation	1a.	Operations	<ul style="list-style-type: none"> Roadway Level of Service Non-Motorized Accommodations and Connectivity
		1b.	Safety	<ul style="list-style-type: none"> Roadside Clear Zones and Recoverable Area Crash Trends and Contributing Factors Non-Motorist Safety
2	Ecological Environment	2a.	Hydraulic Performance	<ul style="list-style-type: none"> Conveyance Capacity of Water Features Hydrologic Connectivity
		2b.	Wetlands	<ul style="list-style-type: none"> Preliminary Jurisdictional Review of Impacted Wetlands Functional Classification of Impacted Wetlands Total Wetland Impact Area
		2c.	Surface Water Resources	<ul style="list-style-type: none"> Floodplain Impacts Stream Channel Impacts Water Quality
3	Fish and Wildlife	3a.	Aquatic Accommodations	<ul style="list-style-type: none"> Fish-Bearing Resource Impacts Aquatic Species Mortality
		3b.	Terrestrial Accommodations	<ul style="list-style-type: none"> Crossing Structure Availability Crossing Structure Attractiveness to Wildlife Wildlife Mortality
		3c.	Habitat	<ul style="list-style-type: none"> Temporary Fish and Wildlife Habitat Impacts During Construction Permanent Fish and Wildlife Habitat Impacts Fish and Wildlife Habitat Connectivity
		3d.	Threatened and Endangered Species	<ul style="list-style-type: none"> Threatened and Endangered Species Mortality Threatened and Endangered Species Accommodations Threatened and Endangered Species Habitat Connectivity
4	Human Environment	4a.	Cultural and Recreational Resources	<ul style="list-style-type: none"> Vernacular Resource Impacts Ethnographic Resources Impacts Section 4(f) Property Impacts
		4b.	Visual Quality	<ul style="list-style-type: none"> Landscape Character Impacts Roadway Corridor Impacts
		4c.	Adjacent Properties	<ul style="list-style-type: none"> Adjacent Property Access Adjacent Business Impacts Permanent Right-of-Way Acquisition
5	Constructability	5a.	Geotechnical Feasibility	<ul style="list-style-type: none"> Potential for Liquefaction/Seismic Risk Groundwater Conditions Soil Conditions
		5b.	Construction Feasibility	<ul style="list-style-type: none"> Construction Ease Specialized Equipment/Material Needs
		5c.	Construction Impacts	<ul style="list-style-type: none"> Traffic Control Needs Detours During Construction Duration of Construction
		5d.	Construction Requirements	<ul style="list-style-type: none"> Temporary Right-of-Way/Easements Permitting/Mitigation Requirements
6	Cost	6a.	Cost of Improvements	<ul style="list-style-type: none"> Capital Costs (Design, Construction, Materials)
		6b.	Maintenance Needs/Cost	<ul style="list-style-type: none"> Anticipated Maintenance Needs Anticipated Maintenance Costs
		6c.	Cost-Effectiveness	<ul style="list-style-type: none"> Benefits of Improvements Compared to Costs
		6d.	Fundability	<ul style="list-style-type: none"> Competitiveness for Discretionary Program Funding Opportunities for Funding Partnerships

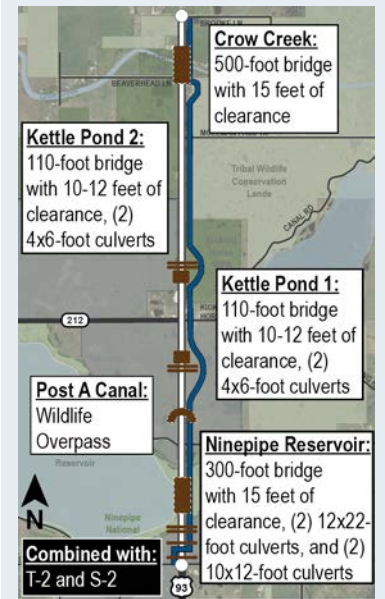
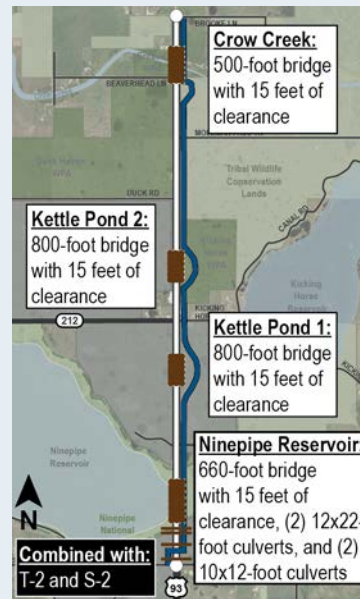
C-1: SEIS Preferred

C-2: Enlarged Crossings

C-3: Wildlife Overpass



Table 7:
Screening
Criterion 1:
Transportation
Scoring Results



1A. OPERATIONS

Marginally improved LOS due to turn bays at intersections. SUP improves non-motorist mobility. SUP alignment connects to planned facilities north and south of corridor.

Same as C-1 except SUP alignment may provide better connections to public lands.

Same as C-2.

SCORE (Out of 5)

3

4

4

1B. SAFETY

Increased shoulder width with rumble strips and flattened slopes help address historic crash trends and provide adequate clear zone and recoverable area. Dedicated SUP improves non-motorist safety. Lower use of wildlife crossing structures expected so less potential for reduction in Wildlife Vehicle Collisions (WVCs).

Same as C-1 but steeper 2:1 fill slopes in sensitive areas are non-recoverable. Introduction of guardrail presents an additional roadside barrier. Improved non-motorist safety and comfort due to greater separation from roadway. Improved wildlife crossing options, greater potential for reduction in WVCs.

Same as C-2 except more frequent and desirable wildlife crossing options have the potential to further reduce WVCs.

SCORE (Out of 5)

3

3

4

SUBTOTAL

6

7

8

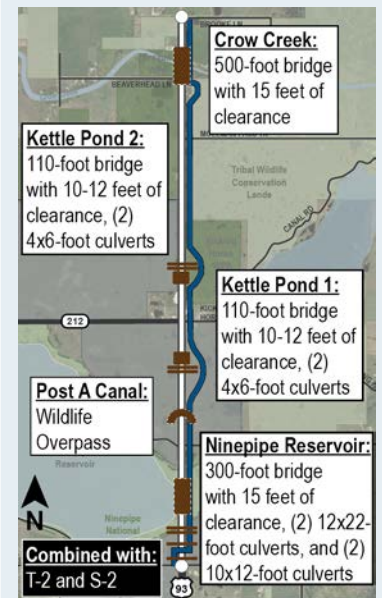
C-1: SEIS Preferred

C-2: Enlarged Crossings

C-3: Wildlife Overpass



Table 8:
Screening
Criterion 2:
Ecological
Environment
Scoring Results



2A. HYDRAULIC PERFORMANCE

All structures improve connectivity and conveyance capacity. 60-ft kettle pond structures may be too small for adequate hydraulic performance. Two smaller structures at Crow Creek are adequate but not as effective as longer bridges for connectivity and capacity.

Structures spanning entire kettle ponds require a greater number of piers in the waterbody but restore full connectivity of ponds. Large, multi-span bridges throughout with higher probability of scour/erosion at in-stream piers.

Structures designed to meet minimum hydraulic requirements. Smaller structures at kettle ponds do not restore full connectivity. Fewer bridge spans required, reduces probability of in-stream piers.

SCORE (Out of 5)

2

4

3

2B. WETLANDS

Flatter fill slopes and smaller structure openings result in greatest wetland impacts and least potential for wetland reconnection at crossing locations.

Fewest impacts overall but higher probability of short-term impacts due to larger structures. Greatest benefit at kettle ponds, anticipated wetland reconnection at all crossing locations.

More impacts than C-2, but less than C-1. Opportunity to reconnect wetlands at Ninepipe Reservoir and Crow Creek.

SCORE (Out of 5)

2

4

3

2C. SURFACE WATER RESOURCES

100% span of Ninepipe Reservoir and 42% span of Crow Creek floodplains. Shorter structures require less fill, less risk of adverse stream or water quality impacts. Stormwater mitigation incorporated.

100% span of Ninepipe Reservoir and 78% span of Crow Creek floodplains. Longer structures require more fill and piers in channel, higher risk of adverse stream or water quality impacts. Stormwater mitigation incorporated.

100% span of Ninepipe Reservoir and 78% span of Crow Creek floodplains. Smaller structures in some locations compared to C-2, lower risk of adverse stream or water quality impacts. Stormwater mitigation incorporated.

SCORE (Out of 5)

3

4

4

SUBTOTAL

7

12

10

C-1: SEIS Preferred

C-2: Enlarged Crossings

C-3: Wildlife Overpass

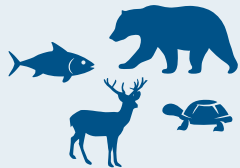
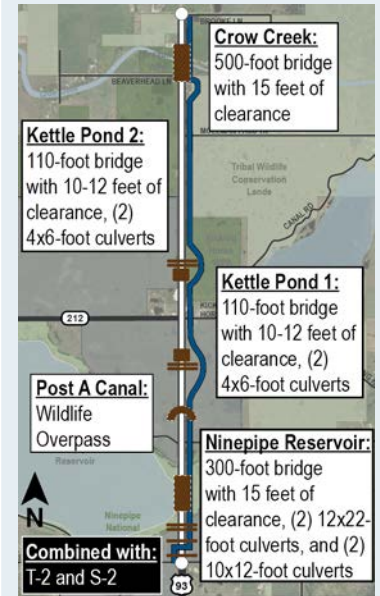


Table 9:
Screening Criterion 3: Fish and Wildlife Scoring Results



<p>3A. AQUATIC ACCOMMODATIONS</p>	<p>Improvement to passability at hydraulic crossings. Some in-stream construction required, potential risk of fish mortality. SUP adjacent to roadway at major crossings results in wider footprint across waterbodies.</p>	<p>Longer structures best restore the hydrologic regime, but at the expense of potential in-stream construction and extensive placement of fill to raise road grade for taller structures. Risk to fish mortality during construction. SUP constructed around sensitive waters.</p>	<p>Same as C-2 but potentially less disruption to species in kettle ponds due to smaller structures.</p>
<p>SCORE (Out of 5)</p>	<p>3</p>	<p>3</p>	<p>4</p>
<p>3B. TERRESTRIAL ACCOMMODATIONS</p>	<p>Crossings may not be sized appropriately (low clearance, small openings in some locations) for use by larger mammals. Some reduction in wildlife mortality anticipated.</p>	<p>Option provides the largest openings at all crossings to meet the wide range of wildlife needs, however, structures over 150 feet may not provide additional benefits. Reduction in wildlife mortality anticipated.</p>	<p>Most crossing opportunities, overpass is most attractive to large mammals. Crossings strategically sized to serve the needs of wildlife anticipated to use each crossing. Greatest potential for reduced wildlife mortality.</p>
<p>SCORE (Out of 5)</p>	<p>2</p>	<p>4</p>	<p>5</p>
<p>3C. HABITAT</p>	<p>Permanent habitat impacts due to increased roadway width and SUP. Temporary habitat impacts due to in-stream construction and general construction. Improved connectivity at hydraulic crossings.</p>	<p>Similar to C-1 but SUP alignment around kettle ponds avoids aquatic habitat while potentially introducing a new barrier if fencing is extended around path. Larger structures provide greater ability to restore habitat connectivity.</p>	<p>Similar to C-2 but overpass provides best habitat connectivity for mammals. Smaller kettle pond structures provide less aquatic habitat connectivity but assumed to be adequate for anticipated use.</p>
<p>SCORE (Out of 5)</p>	<p>2</p>	<p>3</p>	<p>4</p>
<p>3D. THREATENED AND ENDANGERED SPECIES</p>	<p>Underpasses not tall enough to be attractive for grizzly bear crossings, low use anticipated. Bears won't use wet crossings. Minimal improvement to habitat connectivity. Minimal reduction in mortality expected.</p>	<p>Larger crossings at Ninepipe Reservoir and Crow Creek provide most attractive grizzly bear crossings and ability to connect habitat. Reduction in mortality anticipated.</p>	<p>Overpass combined with appropriately sized underpasses expected to be most effective for grizzly bear passage and reduced mortality. Overpass provides best grizzly bear habitat connectivity.</p>
<p>SCORE (Out of 5)</p>	<p>2</p>	<p>4</p>	<p>5</p>
<p>SUBTOTAL</p>	<p>9</p>	<p>14</p>	<p>18</p>

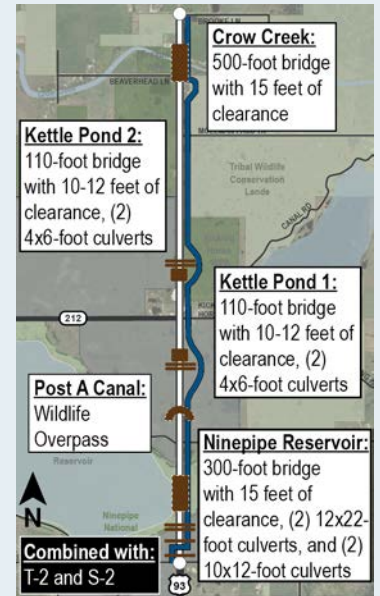
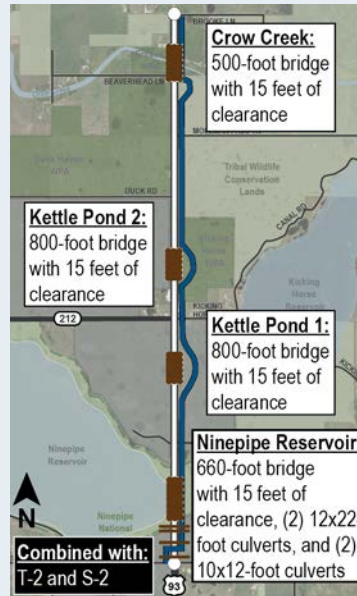
C-1: SEIS Preferred

C-2: Enlarged Crossings

C-3: Wildlife Overpass



Table 10:
Screening
Criterion
4: Human
Environment
Scoring Results



4A. CULTURAL AND RECREATIONAL RESOURCES

Potential impacts to Ninepipe Cultural Property, and potential Section 4(f) impacts to Ninepipe NWR, WMAs, and WPAs, moderately offset by enhancements to wildlife accommodations and improved wetland connectivity, which are culturally valued.

Potential impacts to Ninepipe Cultural Property, potential Section 4(f) impacts to Ninepipe NWR, WMAs, and WPAs, and potential impacts to stagecoach route substantially offset by enhancements to wildlife accommodations and improved wetland connectivity, which are culturally valued.

Potential impacts to Ninepipe Cultural Property, potential Section 4(f) impacts to Ninepipe NWR, WMAs, and WPAs, and potential impacts to stagecoach route substantially offset by enhancements to wildlife accommodations and improved wetland connectivity, which are culturally valued.

SCORE (Out of 5)

3

4

4

4B. VISUAL QUALITY

Temporary construction impacts, permanent impacts due to roadway grade raise and wildlife fencing.

Temporary construction impacts, permanent impacts from wildlife fencing and greatest roadway grade raise compared to C-1 and C-3.

Temporary construction impacts, permanent impacts due to roadway grade raise and wildlife fencing, new overpass structure.

SCORE (Out of 5)

3

2

2

4C. ADJACENT PROPERTIES

One directly impacted building and access impacts south of Creekside Lane. Impacts to Ninepipes Lodge/Museum parking lot and access. Access impacts to Mission Mountain Viewpoint and residence. Reconstruction of Beaverhead Drive required. Approximately 31.6 acres would need to be acquired.

One indirectly impacted building and access impacts south of Creekside Lane. Impacts to Ninepipes Lodge/Museum parking lot and access. Access impacts to Mission Mountain Viewpoint and residence. Reconstruction of Beaverhead Drive required. Approximately 34.7 acres would need to be acquired.

One indirectly impacted building and access impacts south of Creekside Lane. Impacts to Ninepipes Lodge/Museum parking lot and access. Access impacts to Mission Mountain Viewpoint and residence. Reconstruction of Beaverhead Drive required. Approximately 35.7 acres would need to be acquired.

SCORE (Out of 5)

1

2

2

SUBTOTAL

7

8

8

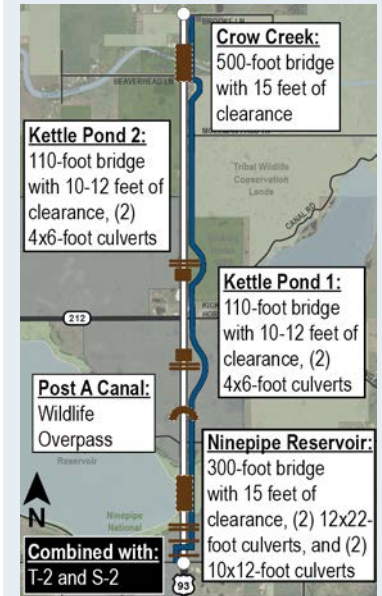
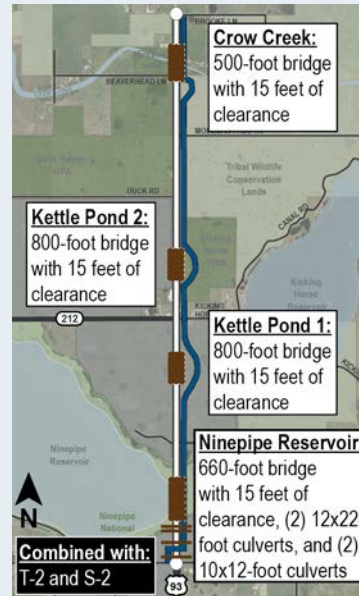
C-1: SEIS Preferred

C-2: Enlarged Crossings

C-3: Wildlife Overpass



Table 11:
Screening
Criterion 5:
Constructability
Scoring Results



<p>5A. GEOTECHNICAL CONSIDERATIONS</p>	<p>Moderate geotechnical challenges due to 660-ft bridge at Ninepipe Reservoir and 120-ft/150-ft bridges at Crow Creek.</p>	<p>Most geotechnical challenges due to 660-ft bridge at Ninepipe Reservoir, 800-ft bridges at kettle ponds, 500-ft bridge at Crow Creek, and steepened fill slopes throughout corridor.</p>	<p>Moderate geotechnical challenges due to 300-ft bridge at Ninepipe Reservoir, 110-ft bridges at kettle ponds, 500-ft bridge at Crow Creek, and steepened fill slopes throughout corridor.</p>
<p>SCORE (Out of 5)</p>	<p>4</p>	<p>2</p>	<p>3</p>
<p>5B. CONSTRUCTION FEASIBILITY</p>	<p>Moderate construction challenges due to 660-ft bridge at Ninepipe Reservoir.</p>	<p>Most challenging to construct due to 660-ft bridge at Ninepipe Reservoir, 800-ft bridges at kettle ponds, 500-ft bridge at Crow Creek, and steepened fill slopes.</p>	<p>Moderate construction challenges due to 300-ft bridge at Ninepipe Reservoir, 110-ft bridges at kettle ponds, 500-ft bridge at Crow Creek, and steepened fill slopes.</p>
<p>SCORE (Out of 5)</p>	<p>3</p>	<p>2</p>	<p>3</p>
<p>5C. CONSTRUCTION IMPACTS</p>	<p>Moderate construction impacts, with travel likely maintained on routes parallel to US 93 within construction limits. Some travel delays expected due to reduced speeds in work zones.</p>	<p>Greatest construction impacts due to largest structures. Some travel delays expected due to reduced speeds in work zones. Adjacent detours needed around kettle ponds.</p>	<p>Moderate construction impacts, with travel likely maintained on routes parallel to US 93 within construction limits. Some travel delays expected due to reduced speeds in work zones. Adjacent detours needed around kettle ponds.</p>
<p>SCORE (Out of 5)</p>	<p>3</p>	<p>2</p>	<p>3</p>
<p>5D. CONSTRUCTION REQUIREMENTS</p>	<p>Permitting, additional environmental documentation, and mitigation would be required.</p>	<p>Permitting and additional environmental documentation would be required. Reduced wetland mitigation compared to C-1.</p>	<p>Permitting and additional environmental documentation would be required. Reduced wetland mitigation compared to C-1.</p>
<p>SCORE (Out of 5)</p>	<p>2</p>	<p>3</p>	<p>3</p>
<p>SUBTOTAL</p>	<p>12</p>	<p>9</p>	<p>12</p>

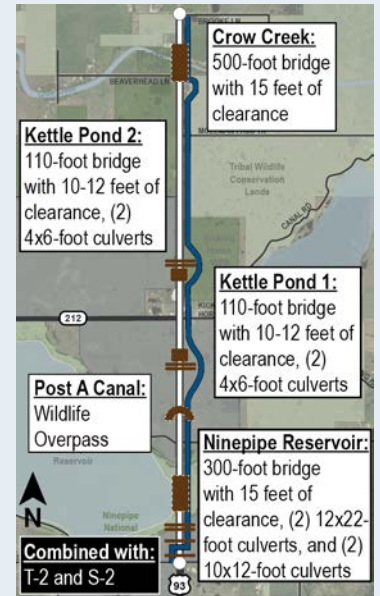
C-1: SEIS Preferred

C-2: Enlarged Crossings

C-3: Wildlife Overpass



Table 12:
Screening
Criterion 6:
Cost Scoring
Results



6A. COST OF IMPROVEMENTS

Lower cost compared to C-2.

Highest capital costs.

Lower cost compared to C-2.

SCORE (Out of 5)

3

1

3

6B. MAINTENANCE NEEDS/COSTS

Maintenance for SUP and new structures.

Maintenance for SUP and new structures (longer than C-1).

Maintenance for SUP and new structures, minimal maintenance for overpass, opportunity for shared responsibility.

SCORE (Out of 5)

3

2

3

6C. COST EFFECTIVENESS

Similar cost to C-3 but with fewer benefits and more impacts.

Moderate impacts, moderate environmental benefits, 1.5 times the cost of C-3.

Greatest wildlife accommodation benefits, moderate environmental benefits, moderate impacts, lowest capital costs.

SCORE (Out of 5)

2

2

4

6D. FUNDABILITY

Somewhat more likely to be funded compared to C-2 due to higher BCR. Low potential for partnerships.

Lower likelihood of funding due to low BCR.

BCR favors funding. Potential partnership opportunity with MFWP for overpass.

SCORE (Out of 5)

3

2

4

SUBTOTAL

11

7

14

4.7. Screening Summary

Table 13 provides a summary of the scores allocated to each corridor option. Option C-3 received the highest overall score (70 out of 100 points) and also scored the highest or tied for the highest score in all screening categories except ecological environment. Options C-1 and C-2 scored similarly (52 and 57 points out of 100, respectively) with C-2 scoring slightly higher due to superior operational, ecological, and fish and wildlife elements.

Table 13: Corridor Option Screening Summary

Screening Criteria		Sub-Criteria		Total Possible Points	C-1: SEIS	C-2 Enlarged Crossings	C-3: Wildlife Overpass
1	Transportation	1a.	Operations	5	3	4	4
		1b.	Safety	5	3	3	4
Transportation Subtotal				10	6	7	8
2	Ecological Environment	2a.	Hydraulic Performance	5	2	4	3
		2b.	Wetlands	5	2	4	3
		2c.	Surface Water Resources	5	3	4	4
Ecological Environment Subtotal				15	7	12	10
3	Fish and Wildlife	3a.	Aquatic Accommodations	5	3	3	4
		3b.	Terrestrial Accommodations	5	2	4	5
		3c.	Habitat	5	2	3	4
		3d.	Threatened and Endangered Species	5	2	4	5
Fish and Wildlife Subtotal				20	9	14	18
4	Human Environment	4a.	Cultural and Recreational Resources	5	3	4	4
		4b.	Visual Quality	5	3	2	2
		4c.	Adjacent Properties	5	1	2	2
Human Environment Subtotal				15	7	8	8
5	Constructability	5a.	Geotechnical Considerations	5	4	2	3
		5b.	Construction Feasibility	5	3	2	3
		5c.	Construction Impacts	5	3	2	3
		5d.	Construction Requirements	5	2	3	3
Constructability Subtotal				20	12	9	12
6	Cost	6a.	Cost of Improvements	5	3	1	3
		6b.	Maintenance Needs/Cost	5	3	2	3
		6c.	Cost-Effectiveness	5	2	2	4
		6d.	Fundability	5	3	2	4
Cost Subtotal				20	11	7	14
Total Score				100	52	57	70

CHAPTER 5: CONCLUSIONS AND NEXT STEPS

This study evaluated the Ninepipe segment of US 93 between RP 40.0 (Gunlock Road) and 44.5 (Brooke Lane) to determine if the preferred alternative from the 2008 SEIS would be feasible to construct and if any modifications were warranted based on updated knowledge of the corridor. After a comprehensive review of relevant conditions coupled with focused outreach with the public, stakeholders, and Tribal, federal, and state resource agencies, the study evaluated three corridor options according to their performance in six screening categories.

The study determined that all three options are likely feasible to implement. There are no known conditions that would prohibit construction of the options including proposed bridge structures given adequate funding availability. A summary of the tradeoffs between benefits and disadvantages is provided below.

- **Option C-1**, the SEIS preferred alternative, demonstrated a relative balance of benefits and disadvantages. This supports the findings of the SEIS.
- **Option C-2** was developed to better accommodate wildlife passage by incorporating longer bridges with more vertical clearance and reduce impacts to natural resources by incorporating steepened slopes in sensitive areas. The evaluation determined that C-2 provides better fish and wildlife accommodations, reduces impacts to sensitive resources, and provides additional benefits to non-motorists. However, C-2 is more impactful to the human environment due to the larger structures and is likely to be more challenging to fund and construct, with a potentially prohibitive cost.
- To develop **Option C-3**, modifications to C-2 were strategically made to provide wildlife accommodations that would attract greater use, further reduce impacts, improve constructability, and reduce cost. Overall, Option C-3 was determined to be the most cost-effective option with fewer impacts, greatest benefits, and the greatest potential for funding due to likely increased competitiveness for discretionary grant programs.

Based on this evaluation, Option C-3 was identified as the preferred option to advance for future project development.

5.1. Project Development Considerations

To continue with the development of one or more projects in the corridor, the following steps would need to be taken.

- Identify and secure a funding source or sources.
- For MDT-led projects, follow MDT guidelines for project nomination and development, including a public involvement process, additional environmental documentation as discussed in **Section 5.1.1**, and design and construction processes as discussed in **Section 5.1.2**.
- For projects that are developed by or with others and may impact MDT routes, coordinate with MDT System Impact Action Process (SIAP) Section staff, MDT Environmental Services Bureau staff, and through other appropriate collaborative processes, including Tribal, federal, and state agency coordination and appropriate mitigation.

5.1.1. Environmental Documentation

The purpose of this study was to evaluate the feasibility of highway reconstruction in terms of impacts, costs, and construction considerations. The study was limited to evaluation of changes to relevant conditions since the time of the 2008 SEIS that may influence either the need or feasibility of future corridor improvements. The feasibility study did not comprehensively assess all resources that may be affected by a reconstruction project.



Given the changed environmental conditions in the Ninepipe segment along with proposed modifications to the preferred reconstruction option, a new environmental document would need to be prepared to meet National Environmental Policy Act (NEPA) requirements. The specific level or type of environmental document would be determined through the project development process.

The updated environmental document would address the full list of topics previously considered in the 1996 FEIS and 2008 SEIS for this corridor, as outlined in **Table 14**. This analysis would include topics raised during the public comment period that were outside the scope of this feasibility study such as noise impacts, land use changes, and cumulative impacts. Additionally, the document would outline any changes in proposed mitigation or permitting compared to the SEIS.

Should this feasibility study lead to future projects, compliance with federal environmental regulations will be required. This study may be used as the initial basis for determining impacts and subsequent mitigation for the improvement options in future environmental documentation. Any future project must comply with Code of Federal Regulations Title 23 Part 771, which outlines the requirements for documenting environmental impacts on highway projects.

Table 14: Future Environmental Documentation Topic Areas

Affected Environment and Environmental Consequences	
Traffic Operations and Safety	Prime and Unique Farmland
Land Use	Water Quality
Noise	Wetlands
Social	Floodplains and Streams
Economics	Fish and Wildlife
Pedestrians and Bicyclists	Parks and Recreation
Air Quality	Cultural Resources
Threatened & Endangered Species	Right of Way & Relocations
Hazardous Materials	Geology and Soils
Visual	Cumulative Impacts
Other Considerations	

5.1.2. Design and Construction Considerations

Decisions made as part of previous environmental documents, including maintenance of the existing horizontal roadway alignment and provision of a two-lane roadway configuration with widened shoulders, were carried forward as a starting point for the US 93 Ninepipe Corridor Feasibility Study. Further investigation into the feasibility of improvements and changes to other corridor features given new information and changed conditions was conducted for this study.

Extensive coordination with Tribal, federal, and state resource agencies and other environmental experts resulted in determination of approximate dimensions and placement recommendations for wildlife crossing structures and a shared use path through the Ninepipe corridor. The study also identified and discussed the need for wildlife fencing to maximize the utility of wildlife crossing structures and minimize conflicts between vehicles, humans, and wildlife. The purpose of the study was to provide a planning-level evaluation of these wildlife and pedestrian accommodations to determine the feasibility of a future project within the corridor. Further coordination with partner agencies and organizations, additional environmental evaluations, and detailed engineering analysis would need to occur during the project development process to determine the exact design details associated with each project feature.



Source: MizC

Wildlife fencing can be used to help maximize the utility of wildlife crossings and minimize conflicts between vehicles, humans, and wildlife.

At the time of this feasibility study, environmental experts provided recommendations for wildlife accommodations and shared use path features as listed below. MDT will consider these recommendations while relying on the most current standards, research, technology, and impact analysis available at the time a reconstruction project is nominated in order to develop the design for the Ninepipe corridor.

- Undercrossing structures intended to accommodate large mammal passage, including those at the Ninepipe Reservoir and Crow Creek, should provide a minimum of 40 feet of passable dry ground.¹⁵
- The wildlife overpass should be designed according to updated standards,¹⁶ including an oval opening with minimal peak and a flat top to provide a line of sight as well as adequate security cover via vegetation or other means.
- Appropriate wildlife fencing should be installed throughout the corridor to ensure the effectiveness of new wildlife crossing structures. Fencing placement and design should reflect the most current research and best practices at the time a project proceeds.

- Proximity to the Ninepipe National Wildlife Refuge and seasonal hours of operation should be considered for the shared use path to minimize potential impacts and human disturbance to nesting birds and other wildlife.

Once a project is nominated and proceeds to design, MDT will develop a specific plan detailing roadway and structure construction methods, sequencing, and specific work zone safety and mobility strategies to safely maintain traffic during construction. To accommodate construction on the highway, detours are anticipated adjacent to US 93 within existing highway right-of-way. MDT will employ appropriate strategies to minimize traffic delays and impacts to adjacent roadways, ensure mobility and safety for the traveling public and workers, maintain access for businesses and residences, and complete roadwork in a timely and efficient manner.

As the project develops, MDT will work closely with Tribal, federal, and state resource agencies, landowners, residents, and businesses to minimize impacts to adjacent properties, wildlife habitat, wetlands, and cultural resources and to comply with all appropriate permitting and mitigation requirements.

**NINEPIPE
CORRIDOR**



**FEASIBILITY
STUDY**

REFERENCES

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- ⁶ USGS, Bird Checklists of the United States, Ninepipe and Pablo National Wildlife Refuges, Northern Prairie Wildlife Research Center, 2021, available at: <https://www.fws.gov/uploadedFiles/NinepipePablo%20Bird%20List.usgs.pdf>
- ⁷ Werner et al, Amphibians and Reptiles on the Flathead Reservation, 1998.
- ⁸ USFWS, Ninepipe National Wildlife Refuge Wildlife and Habitat, 2021, available at https://www.fws.gov/refuge/Ninepipe/wildlife_and_habitat/index.html.
- ⁹ CSKT, Flathead Indian Reservation, Post Creek Area Bear Movement Report. 2014.
- ¹⁰ Griffin and Pletcher, Potential Effects of Highway Mortality and Habitat Fragmentation on a Population of Painted Turtles in Montana, Prepared for the State of Montana Department of Transportation in cooperation with the U.S. Department of Transportation Federal Highway Administration, 2006.
- ¹¹ CSKT Wildlife Management Program, Grizzly Bear Zone Map for the Ninepipe Vicinity, 2021.
- ¹² USFWS, Endangered Species Act Section 7 Consultation Biological Opinion on the Revised US 93 Evaro to Polson (RP 6.8 to 59.0) NH 5-2(159)37; UPN 8008000 TAILS Number: 06E11000-2018-F-0146, 2020.
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- ¹⁴ Costello, C.M., L. Roberts, and S. Courville. Analyses of vehicle-caused grizzly bear mortalities in the US Highway 93 corridor, unpublished data, 2020.
- ¹⁵ Clevenger, A. P., and M. P. Huijser. 2011. Wildlife crossing structure handbook: design and evaluation in North America. Prepared for Federal Highway Administration, Washington, D.C. 223 pp.
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