USDA United States Department of Agriculture
Natural Resources Conservation Service

Draft Watershed Plan-Environmental Impact Statement for the Milk River and St. Mary River Watersheds

Alkali Creek, Antelope Creek, Brazil Creek, Dodson Creek, Exeter Creek-Milk River, Fifteenmile Creek-Milk Creek, Hewitt Lake, Lake Bowdoin, Larb Creek, Lower Battle Creek, Lower Beaver Creek, Lower Lodge Creek, Middle Beaver Creek, Milk Creek-Milk River, Milk River Coulee-Milk River, Mooney Coulee-Milk River, Redrock Coulee, Snake Creek, Snieder Coulee-Milk River, Thirtymile Creek, Willow Creek, Upper Saint Mary River, Upper North Fork Milk River, and Rolph Creek Subwatersheds

Glacier, Hill, Blaine, Phillips, and Valley Counties, Montana
February 2026

Prepared by
U.S. Department of Agriculture
Natural Resources Conservation Service
In cooperation with
Milk River Joint Board of Control

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Draft Watershed Plan-Environmental Impact Statement
for the Milk River and St. Mary River Watersheds: Glacier County, Montana

Lead Agency: U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS), Montana

Cooperating Agencies: U.S. Bureau of Reclamation, Blackfeet Tribe, and Montana Department of Natural Resources and Conservation

Sponsoring Local Organization (SLO): Milk River Joint Board of Control

Authority: This Watershed Plan-Environmental Impact Statement (Plan-EIS) has been prepared under the Authority of the Watershed Protection and Flood Prevention Act of 1954 (Public Law [PL] 83-566) and would be implemented under the PL 83-566 authorized purpose of Agriculture Water Management. The Plan-EIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, PL 91-190, as amended (42 United States Code [U.S.C.] 4321 et seq.).

Abstract: This document is intended to fulfill the requirements of NEPA and to be considered for authorization of PL 83-566 funding for the Preferred Alternative selected within this Plan-EIS (project). The project seeks to alleviate damages to irrigated agriculture and agricultural communities served by the Milk River Project due to unreliable access to St. Mary River water. The Preferred Alternative includes reshaping the infrastructure of the 29-mile St. Mary Canal System; siphon modification; replacing wasteways and underdrains; and addressing slope stability concerns. Total estimated project costs are $154,313,575, of which $40,464,463 would be paid by the sponsors and other non-federal funding sources. The estimated amount to be paid through federal funds is $113,849,112.

This environmental document was initiated using the 40 CFR 1500-1508 (April 2022) and 7 CFR 650 regulations, which were recently rescinded and replaced with USDA regulations found under 7 CFR 1b. In a good-faith effort to fulfill NEPA's requirements, the agency decided to continue to use 40 CFR 1500-1508 (April 2022) and 7 CFR 650. This is permissible per the USDA policy guidance issued in the Interim Final Rule's preamble (90 FR 29644 (July 3, 2025)). In the NRCS's expert opinion, it has thoroughly considered the factors mandated by the statute and the regulatory frameworks it used.

Comments and Inquiries: USDA-NRCS has completed this Draft Plan-EIS in accordance with the NEPA and USDA-NRCS guidelines and standards. Reviewers should provide comments to NRCS during the allotted Draft Plan-EIS review period. Comments need to be submitted by March 30, 2026, to become part of the Administrative Record. To submit comments to be included in the Administrative Record, send them by U.S. Mail to USDA-Natural Resources Conservation Service; Attn: Alyssa Fellow, Environmental Compliance Biologist; Montana State Office; 10 East Babcock Street, Rm 443; Bozeman, MT 59715, or by email to milkriver.project.comments@gmail.com. Inquiries or questions about the project can be emailed to paul.smidansky@usda.gov.

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Summary (OMB Fact Sheet)

Summary Watershed Plan-Environmental Impact Statement

For

Milk River and St. Mary River Watersheds

Subwatersheds: Alkali Creek, Antelope Creek, Brazil Creek, Dodson Creek, Exeter Creek-Milk River, Fifteenmile Creek-Milk Creek, Hewitt Lake, Lake Bowdoin, Larb Creek, Lower Battle Creek, Lower Lodge Creek, Middle Beaver Creek, Milk Creek-Milk River, Mooney Coulee-Milk River, Redrock Coulee, Snake Creek, Snieder Coulee-Milk River, Thirtymile Creek, Willow Creek, Upper Saint Mary River, Upper North Fork Milk River, and Rolph Creek

Glacier, Hill, Blaine, Phillips, and Valley Counties, Montana

1st Congressional District

Authorization

Public Law 83-566 Stat. 666 as amended (16 USC Section 1001 et. seq.) 1954

Sponsor

Milk River Joint Board of Control

Proposed Action:

The Milk River Joint Board of Control (MRJBOC) is analyzing alternatives to address the unreliable access to St. Mary River water needed for irrigation of agricultural areas.

Purpose and Need for Action:

The purpose of this project is to alleviate damages to irrigated agriculture and agricultural communities served by the Milk River Project due to the unreliable access to St. Mary River water. The project is needed to deliver allocated St. Mary River water for Milk River Project beneficiaries to minimize agricultural damages and address the unreliable access to St. Mary River water.

Implementation of the proposed action would meet PL 83-566 Authorized Project Purpose, Agricultural Water Management, through irrigation water conveyance and more reliable agricultural water supply.

Description of the Preferred Alternative/Plan:

Under the Preferred Alternative, MRJBOC would reshape and modernize the infrastructure of the 29-mile St. Mary Canal System to increase the conveyance capacity and improve the

reliability by modifying the Kennedy Creek Crossing Siphon, replacing three drop structures, replacing wasteways and underdrains, and addressing slope stability concerns.

Implementing the Preferred Alternative would support the maintenance of agricultural production. The Preferred Alternative includes measures to address the purpose and need for the project. These measures would increase the supply of water for agriculture by increasing the reliability and efficiency of water delivered for irrigation.

The entire 29 miles of the canal would be reshaped. Reshaping includes improving the existing embankment to establish the minimum required freeboard (distance from the channel's maximum water level to the top of the bank) in the canal and constructing a new embankment on the "uphill" side of the canal. At the Kennedy Creek Crossing Siphon, a new additional RCB would be installed adjacent to the existing siphon, and the existing siphon would remain in place and be rehabbed. Three drop structures would be replaced. Slope stability, or slide mitigation, would occur at areas that are at risk of slope failure due to poorly consolidated glacial sediment, over-steepened slopes, and banks, and/or fluctuations in groundwater conditions due to canal operations and precipitation. The underdrains would be replaced and upsized 6 inches each at the existing locations. The wasteways would be replaced at the existing locations and size would be increased, if needed. Drains would be replaced at existing locations at the capacity needed.

Resource Information

Watershed size

Subwatershed: Service Area	10-Digit Hydrologic Unit Code	Associated Area within the Planning Area (acres)
Snake Creek	1005000408	479.7
Milk Creek-Milk River	1005000413	18,954.7
Exeter Creek-Milk River	1005000415	19,756.6
Alkali Creek	1005000416	3,547.1
Antelope Creek	1005001203	1,121.3
Brazil Creek	1005001205	1,752.8
Willow Creek	1005001209	2,333.3
Middle Beaver Creek	1005001404	161.8
Lake Bowdoin	1005001405	16,832.8
Larb Creek	1005001406	699.5
Lower Beaver Creek	1005001407	47,325.2
Milk River Coulee-Milk River	1005001210	12,066.0

Redrock Coulee	1005000405	7084.0
Fifteenmile Creek-Milk River	1005000406	26,225.9
Thirtymile Creek	1005000409	2,848.6
Hewitt Lake-Milk River	1005000419	15,223.0
Dodson Creek	1005000414	1,146.3
Snieder Coulee-Milk River	1005000421	7,622.7
Mooney Coulee-Milk River	1005001204	12,632.2
Lower Battle Creek	1005000805	1,985.3
Lower Lodge Creek	1005000707	4,191.6
Subwatershed: Project Area	**10-Digit Hydrologic Unit Code**	**Associated Area within the Planning Area (acres)**
Upper Saint Mary River	0904000104	452.8
Upper North Fork Milk River	1005000103	103.2
Rolph Creek	0904000105	596.8

Latitude and Longitude:

Within the St. Mary River Watershed – Start: 48°50′2548.32” N, 113°25′25.30” W; End: 48°58′38.95.06” N, 113°02′26.74” W

Within the Milk River Watershed – Start: 48°34′35.53” N, 109°50′15.10” W; End: 48°04′24.06” N, 106°28′19.36” W

Climate and Topography:

Climate in the project area and the service area (defined in Chapter 3) is characterized by cold winters. Normal minimum temperatures in the project area are between 10 and 20 °F in winter months, with normal maximum temperatures in summer months between 65 and 80 °F. Climate within the service area in the Milk River Watershed is characterized by cold winters with snow cover, usually less than a few inches with some bare ground. Cold snaps and snow can occur as late as early May or as early as September, but spells of mild weather occur at least a few times each winter. Most spring and summer precipitation falls as rain. Normal maximum temperatures in Havre are in the 80s and 90s in July and August. Normal minimum temperatures are between 5 and 20 °F in winter months, with temperatures of -30 to -40 °F occurring regularly.

Elevation in the project area ranges between 4,480 feet and 4,260 feet. Elevation in the service area ranges between 2,450 feet and 2,330 feet.

Land Uses (acres):

Land use adjacent to the defined project area (defined in Chapter 3) within the St. Mary River Watershed is primarily agricultural lands (789 acres; 68% of project area), including grassland, pasture, and shrubland used for grazing and cultivated cropland. Other land uses identified within the project area located within the St. Mary River Watershed include water/wetlands (184 acres; 16% of project area), developed lands (99 acres; 9% of project area), and forested areas (79.6 acres; 7% of project area).

The predominant land cover within the service area (defined in Chapter 3) within the Milk River Watershed is primarily agricultural lands, cropland, and rangeland. The diverted St. Mary River water is used to irrigate these lands.

Construction of the Preferred Alternative would affect 702.21 acres in the project area during construction. Impacts on 344.83 acres would be considered permanent.

Land Ownership: Private (%), State-Local (%), Federal (%)

Land ownership within the project area (defined in Chapter 3) of the St. Mary River Watershed is 20.4% Bureau of Reclamation, 27.3% Tribal Trust Land-Blackfeet, 3.8% Blackfeet Tribe, 47.9% private, and 0.6% State or Local Government. Tribal trust land is considered federal land held in trust for the Tribes.
Land ownership within the service area (defined in Chapter 3) of the Milk River Watershed includes 84.5% private, 4.7% Bureau of Reclamation, 4.2% U.S. Fish and Wildlife Service, 4.1% State or Local Government, 2.5% Bureau of Land Management, <0.01% Other Federal, and <0.01% Tribal Trust Land-Fort Berthold.

Population and Demographics:

The Planning Area contains multiple counties and the Blackfeet Reservation. Within the Blackfeet Reservation, there is an estimated population of 10,706 with 80.27% identifying as Native American/Indian. Blaine County has a population of 7,051 with 52.6% identifying as Native American/Indian. Hill County has a population of 16,297 with 24.2% identifying as Native American/Indian. Phillips County has a population of 4,223 with 6.7% identifying as Native American. Valley County has a population of 7,553 with 9.9% identifying as Native American.

Relevant Resource Concerns:

Resource concerns identified through scoping are cultural and historic resources, endangered and threatened species (plants and animals), fish and fish habitat, floodplain management, general wildlife and wildlife habitat, invasive species/noxious weeds, land use, migratory birds and eagles, noise, prime farmland, public safety, and recreation.

Alternatives

Alternatives Considered

Three alternatives were considered:

- No Action (Future without Federal Investment [FWOFI]) Alternative would result in no construction and continued maintenance.

- Alternative 2 – Canal Modernization, Line/Reshape (Future with Federal Investment [FWFI]) would include lining of the first 9 miles of the St. Mary Canal; reshaping the canal; siphon modification; replacing the Drop Structures, wasteways/drains, and underdrains (culverts).
- Alternative 3 – Canal Modernization, Reshape (FWFI) would include reshaping the St. Mary Canal; siphon modification; replacing Drop Structures, wasteways/drains, and underdrains (culverts); mitigating slides; and improving the O&M roads.

Mitigation, Minimization, and Avoidance Measures

- MRJBOC would coordinate with each landowner along the St. Mary Canal System to discuss the project and obtain a permanent or temporary easement agreement.
- MRJBOC would provide adjacent landowners with a construction schedule before construction begins.
- MRJBOC and Reclamation would coordinate with Milk River Project beneficiaries (e.g., municipalities and irrigation districts) during final design to determine construction timing.
- Where possible, work would be confined within existing St. Mary Canal System ROW.
- Any permanent ROW acquired would follow the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.
- Work within Trust lands would be coordinated with the Bureau of Indian Affairs (BIA) realty office during design of the Preferred Alternative.
- Any work or easements within USFWS easements would be coordinated with the Benton Lake USFWS Wetland Management District.
    - A Special Use Permit may be required if temporary easements are needed on USFWS easements.
- Obtain a National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity that includes a Stormwater Pollution Prevention Plan (SWPPP).
- Standard BMPs will be utilized to minimize runoff into waterbodies adjacent to construction work.
- MRJBOC and Reclamation would coordinate additional geotechnical studies and analysis on soils present within the action area would occur prior to project design completion to minimize bank slope stability issues.
- A detailed analysis of permanent impacts on wetlands and surface waters would be completed for each phase of the St. Mary Canal System as final design occurs.
    - A wetland delineation would be completed, including a consideration of the hydrology source (i.e. seepage, surface flow, etc.) to the wetland.
    - A jurisdictional determination would be completed for the results of the wetland delineation.
    - The delineated boundaries would be used to determine ways to avoid or minimize direct impacts on the wetland areas during final design for wetlands that are jurisdictional under the Clean Water Act and EO 11990.
- Continued coordination would occur with the following:

  - USACE to determine (based on an approved jurisdictional determination request from MRJBOC) jurisdiction of wetlands under Section 404 of the Clean Water Act.
  - USACE to review request for concurrence from MRJBOC elements of fill activities in jurisdictional waters of the U.S. that meet the exemptions (404 (f)) to Section 404 of the Clean Water Act.
  - USACE to review pre-construction notification for activities presumed to quality for Regional General Permit #23 – Irrigation Ditch Related Activities in the State of Montana and provide guidance on mitigation requirements.
  - Blackfeet Tribe, who has the CWA Section 401 certification under their authority, and to obtain a permit under the Blackfeet Ordinance 117, the Blackfeet Aquatic Lands Protection Ordinance. Blackfeet Ordinance 117 protects water quality and wetlands on the Blackfeet Indian Reservation and requires a permit for work within all waterbodies, aquatic and riparian lands, and wetlands within the Blackfeet Reservation. A detailed analysis of additional, permanent impacts on wetlands and surface waters would be completed for each reach of the St. Mary Canal System as final design occurs. Continued coordination would occur with the following:
  - USACE to determine if the canal is jurisdictional and, if so, if the agricultural exemption under Section 404 permitting applies.
  - If USACE determines a Section 404 permit application is determined necessary following the preapplication meeting with the USACE, one would be completed. Mitigation would be identified for permanent impacts caused by the project and a mitigation plan would be completed for each phase and included in the Section 404 permit application.
  - Blackfeet Tribe to obtain CWA Section 401 certification.
  - NRCS would review each phase and the impacts on wetlands for compliance with EO 11990.
- Potential wetland mitigation options would be determined during the design phase, including any potential mitigation bank credits and off- or on-site mitigation. Coordination with each entity noted above would occur to determine the appropriate amount and type of mitigation to meet the regulations.
- Best Management Practices (BMPs) and standard practices, such as minimizing ground and soil disturbance to the minimum amount necessary and ensuring proper erosion control measures are in place, would be utilized during construction to minimize impacts to vegetative communities.
- Temporary vegetation impacts would be mitigated through the use of a revegetation plan and monitoring reseeded areas until they become reestablished.
- Soil replacement and reseeding would occur as required under the NPDES.
- During excavation, topsoil would be saved and replaced as the top layer after trenches are filled. In areas where infrastructure is decommissioned, topsoil would be added from off-site.
- Areas disturbed during access or construction would be regraded to their original contours.

- All areas disturbed during construction would be reclaimed, including reseeding, where possible following the completion of each phase of construction.
- When necessary, compacted areas, such as access roads, stream crossings, and staging and stockpiling areas, would be loosened to facilitate revegetation and improved infiltration.
- Disturbed areas would be planted with native seed mix appropriate to the habitat.
- Reseeding of grasses would occur within the disturbed areas.
- Temporary easement areas would be reseeded following completion of construction activities.
- Tree clearing would occur within the proposed construction limits, and tree plantings would not occur to avoid issues with future effects on the St. Mary Canal System due to roots. Grassland species would be reseeded along the canal's banks.
- NRCS and MTNHP guidelines would be followed for the control of noxious weeds and invasive species, guidelines would be followed during and after construction to minimize spread of these species.
- Reclamation and MRJBOC would coordinate with the NRCS office to identify seed mixes during final design of the project in order to plant competitive native perennial species.
- Herbicide application would be used following construction with targeted application during bud stage or fall regrowth.
    - Wick applicators are preferred to minimize damage to non-target species.
    - Special care would be utilized in riparian zones along the canal to avoid herbicide contamination of water resources.
- An Integrated Pest Management (IPM) approach would be completed.
    - Reclamation and MRJBOC would coordinate with the NRCS, Glacier County, and the Blackfeet Tribe.
    - The IPM would include development of a herbicide application plan and planting schedule with particular care along the O&M road between the diversion and the St. Mary Siphon where mowing, tilling, and herbicide use may be required.
- The IPM also would include the following BMPs
    - Cleaning all equipment and vehicles of organic debris and soil before entering or leaving construction site
    - Avoiding travel through heavily infested areas when possible
    - Proper disposal of removed vegetation from infested zones
    - Topsoil stockpiling and reuse unless the area is already dominated by invasive species—if this is the case, topsoil should be replaced with material from another location.
    - Soil stockpiles should be covered or revegetated quickly.
- For compliance with Section 106 of the NHPA, a finalized PA would be completed by NRCS and consulting parties. The PA would establish the process for further identification, evaluation, and treatment of historic properties associated with this project. It would also establish a process for resolving adverse effects on historic properties. The stipulations of this PA would be followed during construction of the selected Alternative.

- Before construction, Reclamation and NRCS would coordinate with USFWS and Blackfeet Tribal biologists to identify known active nests.
- A qualified biologist would field verify if any trees within 0.5 mile of the project site are actively being used for eagle nesting. If nesting is identified, coordination with USFWS would occur to incorporate BMPs during the entirety of the construction process to minimize impacts on eagles within the vicinity of the project area.
- To minimize impacts on migratory birds, vegetation clearing would be conducted during the non-nesting period, or a qualified biologist would survey the site before construction begins to identify any nesting sites. If sites are identified, coordination would occur with NRCS and USFWS.
- Contractors would be required to comply with the Blackfeet Nation, Fish and Wildlife Code Chapter 4, which outlines regulations related to grizzly bear.
    - Purchasers, employees, contractors, and subcontractors must store food and other attractants in bear-resistant containers (which are listed by the Interagency Grizzly Bear Committee), remove trash daily, and refrain from feeding wildlife.
- Construction work would halt if grizzly bear(s) are present within the work zone.
- Conservation measures would be implemented to minimize or eliminate short-term, adverse, construction-related noise and human impacts on grizzly bears. Conservation measures include:
    - Implement measures to keep in-water work in Kennedy Creek to the minimum amount necessary.
- Conservation measures would be implemented to minimize or eliminate short-term, adverse, construction-related noise and human impacts on the bull trout. Conservation measures include:
    - Implement measures to keep in-water work in Kennedy Creek to the minimum amount necessary. This includes, but is not limited to, construction and removal of any existing or temporary support structures that may be necessary.
    - Implement erosion control measures to prevent further sediment and turbidity from affecting water quality in the creek.
    - Implement an in-water work window from July 15 to December 1 to allow fish movement.
    - Isolate the work area to lessen noise attenuation and turbidity.
    - Maintain both upstream and downstream passage for bull trout during construction.
    - Maintain stream flows through one of two identified braided stream channels throughout construction.
- Conservation measures noted within the Biological Assessment and Biological Opinion would be required to be followed.
- If the federal status of the monarch butterfly should change prior to the finalization of the Plan-EIS, an addendum to the current version of the BA would be prepared with updated information.

Reclamation and MRJBOC would create traffic control plans in consultation with Glacier County, the Blackfeet Tribe, and emergency services within the area prior to construction.

Project Costs	Federal Funds $	Federal Funds %	Other Funds $	Other Funds %	Total $	Total %
Construction[1]	$82,889,947	75%	$27,629,982	25%	$110,519,930	100%
Engineering	$19,677,880	100%	$0	0%	$19,677,880	100%
SUBTOTAL COSTS	$102,567,828	79%	$27,629,982	21%	$130,197,810	100%
Technical Assistance	$7,345,708	100%	$0	0%	$7,345,708	100%
Real Property Rights	$0	0%	$53,698	100%	$53,698	100%
Permitting	$0	0%	$12,780,783	100%	$12,780,783	100%
Project Administration	$3,935,576	100%	$0	0%	$3,935,576	100%
Annual Operation, Maintenance, and Replacement	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Total Costs	$113,849,112	74%	$40,464,463	26%	$154,313,575	100%

[1] Federal construction funds would be shared between NRCS (48.96%) and Reclamation (26.04%).

Project Benefits

***Number of Direct Beneficiaries*:** The service area (defined further in Chapter 3) includes eight irrigation districts, private irrigators, and several municipalities within Hill, Blaine, Phillips, and Valley Counties. The diversion of St. Mary River water into the canal contributes to 101,693 acres of MRJBOC member irrigated lands.

***Other Beneficial Effects – Physical Terms*:** The project would benefit agricultural production within the service area. The aquatic species and recreational opportunities would benefit from the additional flow within Milk River. The project would have a permanent benefit by reducing flash flooding risk for lands directly adjacent to the St. Mary Canal System.

Damage Reduction Benefits	Proposed Project
Water Delivery	$8,957,122 (annualized over a 100 year project life)
Recreation	$814,071 (annualized over a 100 year project life)

Net Benefit	$3,463,355 (annualized over a 100 year project life)
Benefit to Cost Ratio	1.55

Period of Analysis

Installation Period: 11 years

Project Life: 100 years

Funding Schedule

Year	Federal Funds	Other Funds	Total
2026-2028 (Engineering)	$19,677,880	$333,838 (Kennedy Creek Siphon permitting, fees, and real estate)	$20,011,718
2028-2029 (Kennedy Creek Siphon)	$2,441,370	$2,693,816 (includes Drop Structure permitting, fees, and real estate)	$5,135,186
2029-2030 (Drop Structures)	$14,547,200	$9,938,315 (includes slide mitigation permitting, fees, and real estate)	$24,485,515
2030-2031 (Slide Mitigation)	$41,657,297	$17,075,298 (includes canal shaping permitting, fees, and real estate)	$58,732,595
2032-2037 (Canal Shaping)	$35,525,365	$10,423,196	$45,948,561

Environmental Effects

The Preferred Alternative is Alternative 3, Canal Modernization, Reshape (FWFI) based on its ability to best address the Federal Objective and Guiding Principles and provide the most beneficial effects on environmental, social, and economic resources. The Preferred Alternative would be planned, designed, and installed to have long-term net beneficial effects on agricultural production and water quantity.

Implementation of the Preferred Alternative may result in minor, unavoidable adverse effects, such as impacts on land use, farmland, water quality, vegetation diversity, wildlife, fisheries, and visual resources and moderate adverse effects on wetlands and historic properties. The

Sponsor would work closely with partners, contractors, and affected landowners to incorporate measures to avoid and minimize adverse effects.

Major Conclusions

The Preferred Alternative would:

- Increase the capacity of the St. Mary Canal System;
- Improve the reliability of the St. Mary Canal System by addressing the concerns with the aging infrastructure; and
- Deliver an additional approximately 21,538 AF/year to beneficiaries.

Areas of controversy/controversial issues

There have been no areas of controversy identified.

Issues to be Resolved

None

Evidence of Unusual Congressional or Local Interest

St. Mary Siphon Failure in June 2024 has created additional interest in the project.

Compliance

Is this report in compliance with executive orders, public laws, and other statues governing the formulation of water resource projects?
Yes _X_ No ___

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Abbreviations and Acronyms

°F	degrees Fahrenheit
ACHP	Advisory Council on Historic Preservation
AF	acre feet
APE	Area of Potential Effects
ASP	Agency Specific Procedures
BA	Biological Assessment
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BMP	Best Management Practices
BMU	Bear Management Unit
BO	Biological Opinion
CCP	Concrete Cylinder Pipe
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CLG	Certified Local Governments
CWA	Clean Water Act
DEQ	Department of Environmental Quality
DM	Department Manual
DMA	Demographic Monitoring Area
DOI	Department of Interior
DPS	Distinct Population Segment
DR	Department Regulation
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FCA	Farmers Conservation Alliance
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FWOFI	Future without Federal Investment
FWFI	Future with Federal Investment
FWP	Fish, Wildlife, and Parks
GWIC	Ground Water Information Center
GYE	Greater Yellowstone Ecosystem
HDPE	High-density Polyethylene
HEL	Highly Erodible Land
HUC	Hydrologic Unit Code
IJC	International Joint Committee
IPaC	Information for Planning and Consultation
IPMP	Integrated Pest Management Plan
M&I	Municipal and Industrial

MBTA	Migratory Bird Treaty Act
MDT	Montana Department of Transportation
MOA	Memorandum of Agreement
Montana DNRC	Montana Department of Natural Resources and Conservation
MOU	Memorandum of Understanding
MRJBOC	Milk River Joint Board of Control
MTNHP	Montana Natural Heritage Program
NCDE	Northern Continental Divide Ecosystem
NEE	National Economic Efficiency
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLCD	National Land Cover Dataset
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
NWPH	National Watershed Program Handbook
NWPM	National Watershed Program Manual
O&M	Operation and Maintenance
PA	Programmatic Agreement
PCA	Primary Conservation Area
P.L.	Public Law
Plan-EIS	Watershed Plan and Environmental Impact Statement
PM	particulate matter
PR&G	Principles, Requirements, and Guidelines
RCB	reinforced concrete barrel
RCP	Reinforced Concrete Pipe
Reclamation	Bureau of Reclamation
Reservation	The Blackfeet Reservation
ROD	Record of Decision
ROW	right-of-way
SHPO	State Historic Preservation Office
SIP	System Improvement Plan
SOC	Species of Concern
SWPPP	Stormwater Pollution Prevention Plan
TERO	Tribal Employment Rights Ordinance
THPO	Tribal Historic Preservation Office
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WFPO	Watershed and Flood Prevention Operations

1 Purpose and Need for Action

1.1 Introduction

The Milk River Joint Board of Control (MRJBOC), in partnership with the Bureau of Reclamation (Reclamation), manages the Milk River Project. The Milk River Project is an intricate infrastructure system that diverts water from the St. Mary River on the Blackfeet Reservation (Reservation) and delivers it to the North Fork of the Milk River. The water then travels in the Milk River across southern Alberta, Canada, and back into Montana in the heart of the Milk River Basin. The Milk River Project, known as the "Lifeline of the Hi-Line," irrigates approximately 140,404 acres (Table 1-1). Beneficiaries of that water include eight irrigation districts, the Fort Belknap Reservation, private irrigators, several municipalities that provide drinking water for 18,000 people, and the Bowdoin National Wildlife Refuge. Figure 1-1 shows the area where Milk River Project beneficiaries are located relative to where their water supply comes from.

Table 1-1. Milk River Project Irrigator Distribution

Irrigator	Irrigated Acres	MRJBOC Member
Irrigation Districts	101,134	Y
District Pumpers	559	Y
River Pumpers	8,211	N
Private Land Irrigators	25,000	N
Reservation	5,500	N
Total JBOC Irrigated Acres	101,693	--
Total Non-JBOC Irrigated Acres	38,711	--
Total Irrigated Acres	140,404	--

In the 1800s, as areas of the Hi-Line were being settled, it became clear that the precipitation and existing access to water would not be adequate to support agricultural development. The Milk River Project was constructed as a long-term solution. Milk River Project components include the St. Mary Canal System, Sherburne Dam, Swiftcurrent Creek Dike, St. Mary River Diversion, Fresno Dam, and Nelson Reservoir. Reclamation owns and operates these components. Overall system management is coordinated between the Milk River beneficiaries, mainly MRJBOC.

Water diverted from the St. Mary River to the Milk River provides the majority of the Milk River Project water, which is combined with the flow coming from the Milk River's natural watershed.

During drought years, St. Mary River water brought through the St. Mary Canal System provides 95 percent of the Milk River's flows (Reclamation 2024). While the Milk River Project has many important infrastructure components, the St. Mary Canal System is crucial because it is the only way in which water can be moved from the St. Mary River to the Milk River. However, due to the state of the St. Mary Canal System's infrastructure, Milk River Project is not conveying the original capacity it was designed for, causing shortages for agricultural irrigation each year. Additionally, infrastructure failures, such as a catastrophic siphon failure in June 2024, have led to the system being shut down, resulting in the loss of water for Milk River Project beneficiaries. As a result of the siphon failure, irrigators had less than 3 weeks of water for irrigation during the summer of 2025. The Milk River Project beneficiaries' lack of a reliable source of water threatens economic viability, domestic drinking water, and agricultural production for the rural communities in the Montana Hi-Line.

In July 2022, MRJBOC entered into an agreement with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) to prepare a Watershed Plan and Environmental Impact Statement (Plan-EIS)[1] to analyze improvements that would alleviate damages to irrigated agriculture and agricultural communities served by the Milk River Project due to the unreliable access to St. Mary River water. Watershed planning is authorized under the Watershed and Flood Protection Act of 1954 (Public Law [P.L.] 83-566), as amended, and the Flood Control Act of 1944 (P.L. 78-534). The Plan-EIS is being prepared under the NRCS Watershed and Flood Prevention Operations (WFPO) program.

MRJBOC, the sponsor of the Plan-EIS, was formed in 1999 under Montana Code Annotated (MCA) 85-7-1601 to ensure the equitable and efficient delivery of water from the Milk River Project. MRJBOC encompasses eight irrigation districts from Fresno Dam (Havre) to Vandalia Dam (Glasgow) and is comprised of ten board members representing Alfalfa, Fort Belknap, Zurich, Paradise, Harlem, Dodson, Malta, and Glasgow irrigation districts (Figure 1-2). Within the Milk River Project, the Lake Sherburne Dam, Swiftcurrent Creek Dike, St. Mary Diversion Dam, St. Mary Canal, and Fresno Dam are reserved works that Reclamation owns, operates, and maintains. However, an existing agreement between MRJBOC and Reclamation allows for the temporary transfer of operation, maintenance, and replacement of infrastructure, as appropriate, to MRJBOC to comply with PL-566 requirements. Additional information regarding ownership, operation, and maintenance of Milk River Project infrastructure can be found in Section 4.3 of the Plan-EIS.

NRCS is the lead federal agency for this Plan-EIS, and Reclamation and the Montana Department of Natural Resources and Conservation (Montana DNRC) are cooperating agencies. In accordance with the National Environmental Policy Act (NEPA), NRCS is responsible for issuance of a final decision. This Plan-EIS has been prepared to assess and disclose the potential effects of the project. The Plan-EIS is required to request federal funding

[1] A Plan-EIS is required because the federal share of construction costs are anticipated to exceed $25 million (National Archives. 2024. Title 7, Subtitle B, Chapter VI, Part 650.7 When to prepare an EIS. https://www.ecfr.gov/current/title-7/subtitle-B/chapter-VI/subchapter-F/part-650/subpart-A/section-650.7).

through the Watershed Protection and Flood Prevention Act (P.L. 83-566) and has been prepared in accordance with the Council on Environmental Quality's (CEQ) Interim Final Rule Removing NEPA Implementing Regulations (40 Code of Federal Regulations [CFR] 1500–1508), effective April 11, 2025; USDA's Interim Final Rule Revising NEPA procedures, rescinding 7 CFR Part 650, effective July 3, 2025; NRCS's Title 190 General Manual Part 410; NRCS's National Environmental Compliance Handbook Title 190 Part 610; the 2015 NRCS National Watershed Program Manual (NWPM; NRCS 2015a and NRCS 2024); and the 2016 NRCS National Watershed Program Handbook (NWPH; NRCS 2016). Additionally, the analysis included in this Plan-EIS follows the Principles, Requirements, and Guidelines (PR&G) for Water and Land Related Implementation Studies. USDA has issued analysis guidance in Department Manual (DM) 9500-013 (USDA 2017a) and Departmental Regulation (DR) 9500-013 (USDA 2017b), and NRCS uses this guidance as the framework for analyzing federal investments in water resources.

1.1.1 Historical Background

During the 1880s, several small, private irrigation systems were constructed that diverted water directly from the Milk River within Blaine County, Montana. In the mid-1890s, several farmers joined together and constructed a small diversion dam to provide additional water to their system, and other dams soon followed. Before long, upward of a dozen small dams were spread out along the river. While their systems functioned sufficiently during periods of high river flows, the inconsistent nature of the supply threatened the stability of the area. Unless a way could be found to ensure a stable and reliable water supply, the region's future would be in question. Establishment of the Reclamation Service in 1902 was the first step to providing a secure future for farmers of the Milk River Valley (Reclamation 1998).

The initial plans for the Milk River Project were prepared by the Reclamation Service (known today as the Bureau of Reclamation [Reclamation]) and submitted for approval by the Secretary of the Interior on July 8, 1902, only a few weeks following the formation of the Reclamation Service. This submission relied on information developed during ongoing work within the U.S. Geological Survey (USGS). The initial approval authorized the allotment of funds for additional surveys and administrative costs. On March 14, 1903, the Secretary of the Interior authorized construction of Reclamation's first five projects, including the Milk River Project. On March 25, 1905, $1,000,000 was allocated for construction of storage works on the St. Mary River and facilities to divert water from the St. Mary River to the head of the Milk River (Reclamation 1998).

By early 1906, even though the governments of the United States and Canada had been unable to reach an agreement, Reclamation was authorized to draw up specifications and advertise for bids to construct the canal from the St. Mary River to the Milk River. It was believed that construction of the St. Mary Canal System would help to solidify the United States' claim to the waters of the St. Mary River and, if no agreement could be reached, the St. Mary Canal System could be used to irrigate some 100,000 acres in the eastern part of the Blackfeet Reservation and surrounding areas (Reclamation 1998).

The St. Mary Canal System was built between 1907 and 1915, with a design capacity of 850 cubic feet per second (cfs). The canal is earthen and 29 miles long (see Appendix E1). Authorizations for construction of the Dodson Diversion Dam on the Lower Milk River near Dodson, Montana, were given in early August 1906. Additional authorizations were given in 1935 for the Fresno Dam and Reservoir and 1944 for the Dodson Pumping Unit (Reclamation 1998).

In 1909, the Boundary Waters Treaty was signed between the United States and Great Britain. The purpose of the treaty was to prevent disputes regarding the use of boundary waters between the United States and Canada. The treaty notes that the St. Mary and Milk Rivers, and their tributaries in the state of Montana and the provinces of Alberta and Saskatchewan, are to be treated as one stream for the purposes of irrigation and power, and the waters will be apportioned equally between the two countries, but in making such equal apportionment more than half may be taken from one river and less than half from the other by either country so as to afford a more beneficial use to each. It is further agreed that in the division of such waters during the irrigation season, between the 1st of April and 31st of October, inclusive, annually, the United States is entitled to a prior appropriation of 500 cfs of the waters of the Milk River, or so much of such amount as constitutes three-fourths of its natural flow, and that Canada is entitled to a prior appropriation of 500 cfs of the flow of the St. Mary River, or so much of such amount as constitutes three-fourths of its natural flow (The Boundary Waters Treaty of 1909).

The 2009 Montana Legislature passed a compact settlement between the Blackfeet Tribe, the United States, and the State of Montana. The compact quantifies a reserved water right for the Tribe, including water rights in the St. Mary and Milk River Watersheds. This compact includes a settlement of conveying 5,000 acre-feet (AF) of the Blackfeet Tribe's St. Mary River basin water right through the St. Mary Canal System, which at the time of this report has not been enforced (Reclamation 2024). The Blackfeet Tribe and Fort Belknap Indian Community have allotted water rights and may develop more of their federally reserved water rights for St. Mary River and Milk River flows in the future. The Fort Belknap Indian Community has conditionally approved a Water Rights Compact with the State of Montana and has introduced legislation to Congress under the Gros Ventre and Assiniboine Tribes of the Fort Belknap Indian Community Water Rights Settlement Act of 2021. The Blackfeet Tribe has recently enacted a congressionally approved compact allowing for greater access to and control of water within the Blackfeet Reservation.

Within the Blackfeet Climate Change Adaptation Plan, the water rights under the Water Rights Compact can be used to seek possibilities for increasing instream flows for fish populations. The compact noted that instream flows are critical for the species that the Tribe identifies as important, including the beaver. The Blackfeet Tribe has created a Water Rights Implementation Committee that is considering the use of the new water right (Blackfeet Nation 2023a). Coordination on how to implement these water rights is ongoing between the Tribes and Reclamation.

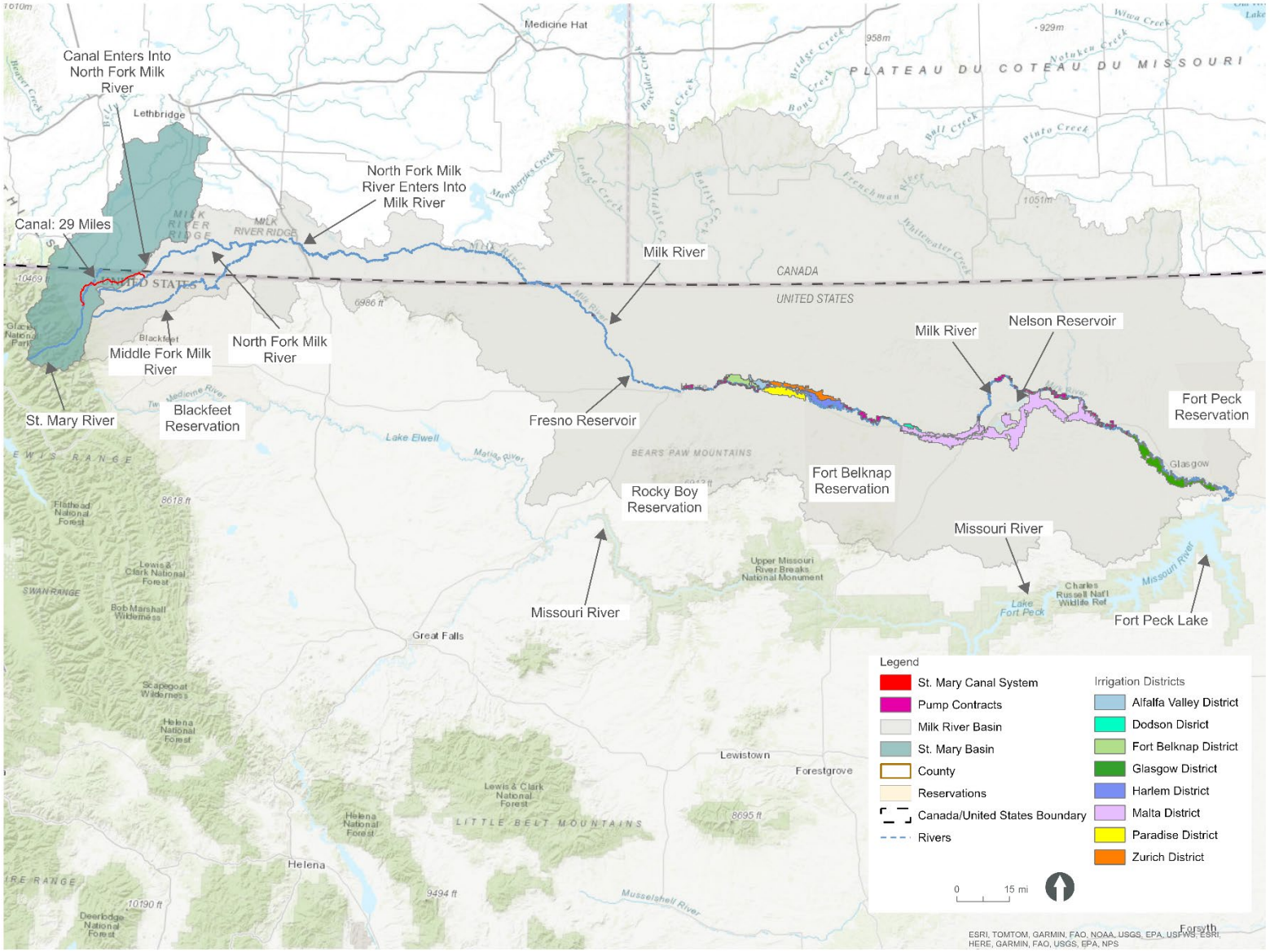

Figure 1-1. Overview of Milk River Watershed, St. Mary River Watershed, and Milk River Project

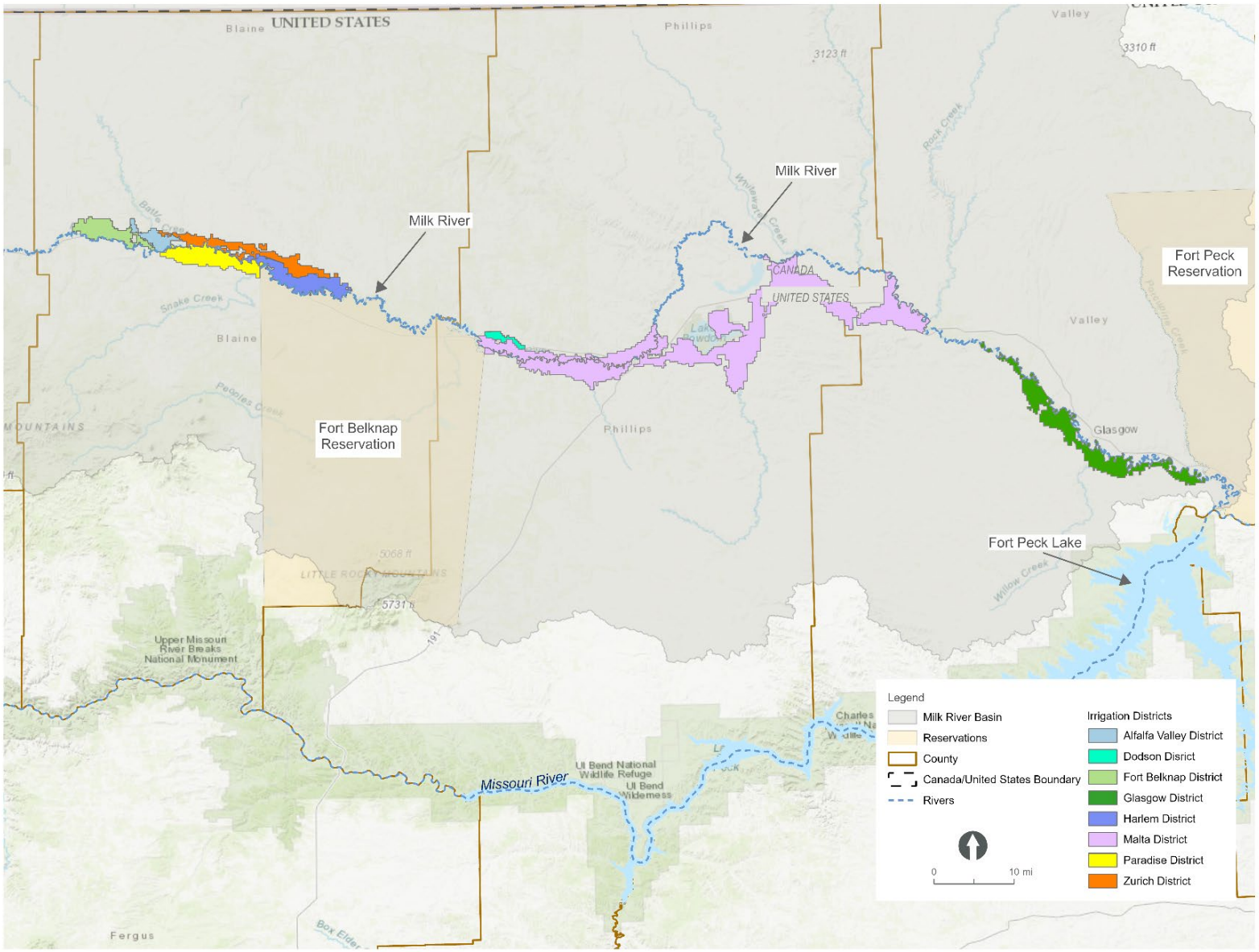

Figure 1-2. Overview of the Irrigation Districts

1.1.2 Federal Objective and Guiding Principles

To meet NRCS requirements for federal investment in a water resources project, a project must meet the Federal Objective set forth in the Water Resources Development Act of 2007 and promote the guiding principles stated in the PR&G for water and land-related resources, implementation studies, and federal water resource investments. The Federal Objective specifies that federal water resources investments shall reflect national priorities, encourage economic development, and protect the environment by:

1. seeking to maximize sustainable economic development,
2. seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used,
3. protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems.

Additionally, the project should seek to achieve the guiding principles identified by the federal government.

1.2 Purpose and Need for the Project

The purpose of this Plan-EIS is to alleviate damages to irrigated agriculture and agricultural communities served by the Milk River Project due to unreliable access to St. Mary River water. The project is needed to deliver fully allocated St. Mary River water for Milk River Project beneficiaries to minimize agricultural damages and address the unreliable access to St. Mary River water. The proposed purpose of this project falls under P.L. 83-566 Authorized Project Purpose (v), Agricultural Water Management.

The following sections provide additional details concerning the stated need for the project.

1.2.1 Not Meeting Allocated Water Rights

Water diverted from the St. Mary River serves 140,404 irrigated acres (Table 1-1). Beneficiaries that receive this St. Mary River water include irrigation districts and municipalities. The irrigation districts meet with Reclamation each year to discuss the water supply outlook. According to Reclamation's *2025 St. Mary River and Milk River Basins Study Final Report*, irrigation water shortages currently average approximately 77,000 AF per year, which is approximately 37 percent of the total amount of water needed for optimal crop growth (Reclamation 2025). Water shortages are projected to increase in the future, with an approximately 15 to 18 percent increase in irrigation depletions anticipated by 2050 (Reclamation 2024).

The communities of Havre, Chinook, and Harlem; Hill County; and the North Havre Water District receive St. Mary Canal System water that is used to provide domestic water to 18,000 people. The communities are using less than their contracted volume and are currently using an average of 2,600 AF annually, while their combined contracted water amount is up to

4,600 AF annually (Reclamation 2024). The canal and its components were originally designed and constructed to convey the full water right allocation of 850 cfs from the St. Mary River. However, age, corrosion, erosion, bank sloughing, landslide encroachment, sedimentation, and deposition have affected the St. Mary Canal System's conveyance capacity. The factors contributing to the inability to meet the allocated water rights are summarized below:

- Reduction in Canal Capacity – Over time, sloughing (erosion) of the canal embankment has reduced the canal's capacity to 600 to 650 cfs. Sloughing has occurred due to:
    - Non-Uniform Canal Shape – When constructed, only one side of the canal was constructed with an earthen berm, as the natural topography was used to form the other side. Over time, natural processes, as well as other contributing factors (see Canal Water Management below), have caused erosion to the natural topography and has reduced the canal's overall conveyance capacity.
    - Canal Water Management – The age and deterioration of the wasteways, spillways, drains, and underdrains contribute to bank sloughing.
        - Kennedy Creek Siphon – The Kennedy Creek Siphon allows canal water to pass underneath Kennedy Creek. The current capacity of the siphon is undersized, which results in a backwater/ponding effect from the inlet of the siphon almost to the diversion structure. This backwater/ponding effect lowers the velocity of the channel, resulting in sediment depositing in the canal. Over time, this has resulted in a loss of canal capacity. In addition, the current size of the siphon does not allow for current freeboard (open area in the siphon when the canal is operating at full capacity) design criteria that provide a measure of safety related to potential siphon failure. Additionally, the age of the siphon puts it at a risk of failure.
        - Wasteways, Spillways, and Drains – Wasteways, spillways, and drains are essential system components that minimize canal damages when conditions are present that threaten the integrity of the canal. Spillways are either naturally occurring or designed grassy areas that allow excess water to overtop the canal in vegetated areas during high-flow events. Wasteways and drains serve as protective structures and facilitate the release of excess water from the canal and/or draining of the canal. They are used to avoid sending water through a system component that has failed (such as during the St. Mary Siphon failure in 2024) or due to stormwater that, unless released, could overtop the canal and cause embankment failures and/or increase the potential for erosion and subsequent sediment deposition in the canal. The current condition of the wasteways and drains does not allow for effective release of excess canal water. As a result, during a failure, additional sediment deposition occurs in the canal downstream of the failure. During storm events that

contribute excess water into the canal, the inability to release excess water increases water levels in the canal. This, combined with the current canal shape, which uses natural topography for the right bank embankment, increases the potential for erosion and subsequent sediment deposition in the canal.

- Underdrains – Underdrains convey natural drainages under the canal rather than the water from the drainages being blocked and putting the structural integrity of the canal bank at risk of failure. Additionally, the underdrains prevent additional water from entering the canal uncontrolled. Due to their age and design, many underdrains are blocked or do not function as effectively as needed. Similarly to wasteways, spillways, and drains, excess water in the canal increases the potential for erosion and subsequent sediment deposition in the canal.

- Slope Stability Areas – Slope failures are common along the canal due to poorly consolidated glacial sediment, over-steepened slopes and banks, and fluctuations in groundwater conditions due to canal operations and precipitation. Slope stability areas adversely affect the canal's capacity by reducing the cross-sectional area available for canal flows and the canal's reliability due to canal overtopping and the resultant potential failure of canal banks. Thirteen specific areas of active landslides exist along the canal.

Due to these reasons, the St. Mary Canal System is limited to diversions of 600 to 650 cfs instead of 850 cfs. In addition to the capacity difference, the 600 to 650 cfs being diverted within the canal experiences additional loss due to seepage. The combination of the reduced capacity and loss due to seepage and evaporation is approximately 17,180 AF per year. Water loss details can be found in Appendix D2 of this Plan-EIS.

1.2.2 Unreliable Access to St. Mary River Water

In addition to capacity issues, beneficiaries face the threat of losing access to St. Mary River water. For St. Mary River water to reach beneficiaries, it must be conveyed from the St. Mary River to the Milk River. If the St. Mary Canal System is not operating, beneficiaries only have access to St. Mary River water that has previously been stored in the Fresno Reservoir and the natural Milk River flows. Water distribution is governed by underlying contractual requirements.

Failure of any part of the St. Mary Canal System's major components (i.e., Drop Structures, siphons, etc.) during the periods in which the Fresno Reservoir is being filled necessitates a partial or full shutdown of the St. Mary Canal System. Past system failures include:

- Slope Stability Areas – As described above, slope stability areas not only reduce the capacity of the canal but create the need for a system shutdown.
- Drop Structures Failures – On May 17, 2020, Drop Structure 5 suffered a catastrophic failure. As a result of this failure, Drop Structure 5 was replaced in the summer and fall of 2020 along with Drop Structure 2.

- Siphon Failures – On June 17, 2024, the St. Mary Siphon failed catastrophically causing a nearly year-long system shut down (Photo 1).

Photo 1. Failure of St. Mary Siphon

The inability to reliably convey St. Mary River water changes the flows of the Milk River, reduces the ability to fill the Fresno Reservoir, and compromises clean drinking water, agricultural production, habitat and water availability for fish and wildlife, and economic viability for many of the surrounding communities.

1.3 Problems and Opportunities

1.3.1 Problems

The following resource problems are represented through project needs:

- Unreliable water supply delivery for agricultural production, which affects agricultural production.
- Unreliable water supply to rural municipalities and water systems.
- Ecosystem and environmental effects due to St. Mary River water not maintaining or contributing to the flows within the Milk River.

1.3.2 Opportunities

The following resource opportunities would be met through implementation of the project:

- Improve water delivery to irrigators within the service area (defined in Section 1.4).
- Increase water supply availability and drought resilience for irrigators throughout the region.
- Minimize the potential for environmental damages, including potential damage to the St. Mary and North Fork Milk Rivers.
- Minimize the risk of crop failure due to insufficient water delivery.
- Educate the public about the history of the Milk River Project.
- Educate the public about water conservation.
- Prevent damage or impact on unknown historic properties from system failures, inundation, and ground disturbances.

1.4 Planning Area

The planning area[2] is defined as the irrigation problem area, which includes two distinct geographic areas, as shown in Figure 1-3 and Figure 1-4.

The first distinct geographic area is referred to as the service area in this Plan-EIS. The service area is in eastern Montana and includes eight irrigation districts in Hill, Blaine, Phillips, and Valley Counties that receive St. Mary River water via the Milk River. The service area is experiencing agricultural damages from unreliable access to St. Mary River water. The Milk River Project is unique in that the service area is located approximately 160 miles from the irrigation water supply.

The second distinct geographic area is referred to as the project area in this Plan-EIS. The project area includes the irrigation supply system for the service area. The project area is in Western Montana, outside of Babb in Glacier County, where the existing St. Mary Canal System and potential proposed actions outside of the irrigated lands would occur. Table 1-2 lists the Hydrologic Unit Code (HUC) 10 subwatersheds the service area crosses, and Table 1-3 lists the HUC 10 subwatersheds the project area crosses.

Table 1-2. Subwatersheds Associated with the Service Area

Subwatershed Name	10-digit Hydrologic Unit Code	Associated with the Planning Area (acres)
Snake Creek	1005000408	479.7
Milk Creek-Milk River	1005000413	18,954.7
Exeter Creek-Milk River	1005000415	19,756.6
Alkali Creek	1005000416	3,547.1
Antelope Creek	1005001203	1,121.3
Brazil Creek	1005001205	1,752.8
Willow Creek	1005001209	2,333.3
Middle Beaver Creek	1005001404	161.8
Lake Bowdoin	1005001405	16,832.8
Larb Creek	1005001406	699.5
Lower Beaver Creek	1005001407	47,325.2
Milk River Coulee-Milk River	1005001210	12,066.0
Redrock Coulee	1005000405	7,084.0
Fifteenmile Creek-Milk River	1005000406	26,225.9
Thirtymile Creek	1005000409	2,848.6
Hewitt Lake-Milk River	1005000419	15,223.0
Dodson Creek	1005000414	1,1146.3
Snieder Coulee-Milk River	1005000421	7,622.7

[2] The “planning area” referred to in this Plan-EIS is equivalent to the term “watershed area” as defined by NWPM 506.60.TTT (NRCS 2015a). The term “planning area” is used in this Plan-EIS in an effort to reduce confusion between the NWPM 506.60. The watershed areas are defined by hydrologic unit codes.

Subwatershed Name	10-digit Hydrologic Unit Code	Associated with the Planning Area (acres)
Mooney Coulee-Milk River	1005001204	12,632.2
Lower Battle Creek	1005000805	1,985.3
Lower Lodge Creek	1005000707	4,191.6
--	Total	203,990.5

Table 1-3. Subwatersheds Associated with the Project Area

Subwatershed Name	10-digit Hydrologic Unit Code	Associated with the Project Area (acres)
Upper Saint Mary River	0904000104	452.8
Upper North Fork Milk River	1005000103	103.2
Rolph Creek	0904000105	596.8
--	Total	1,152.8

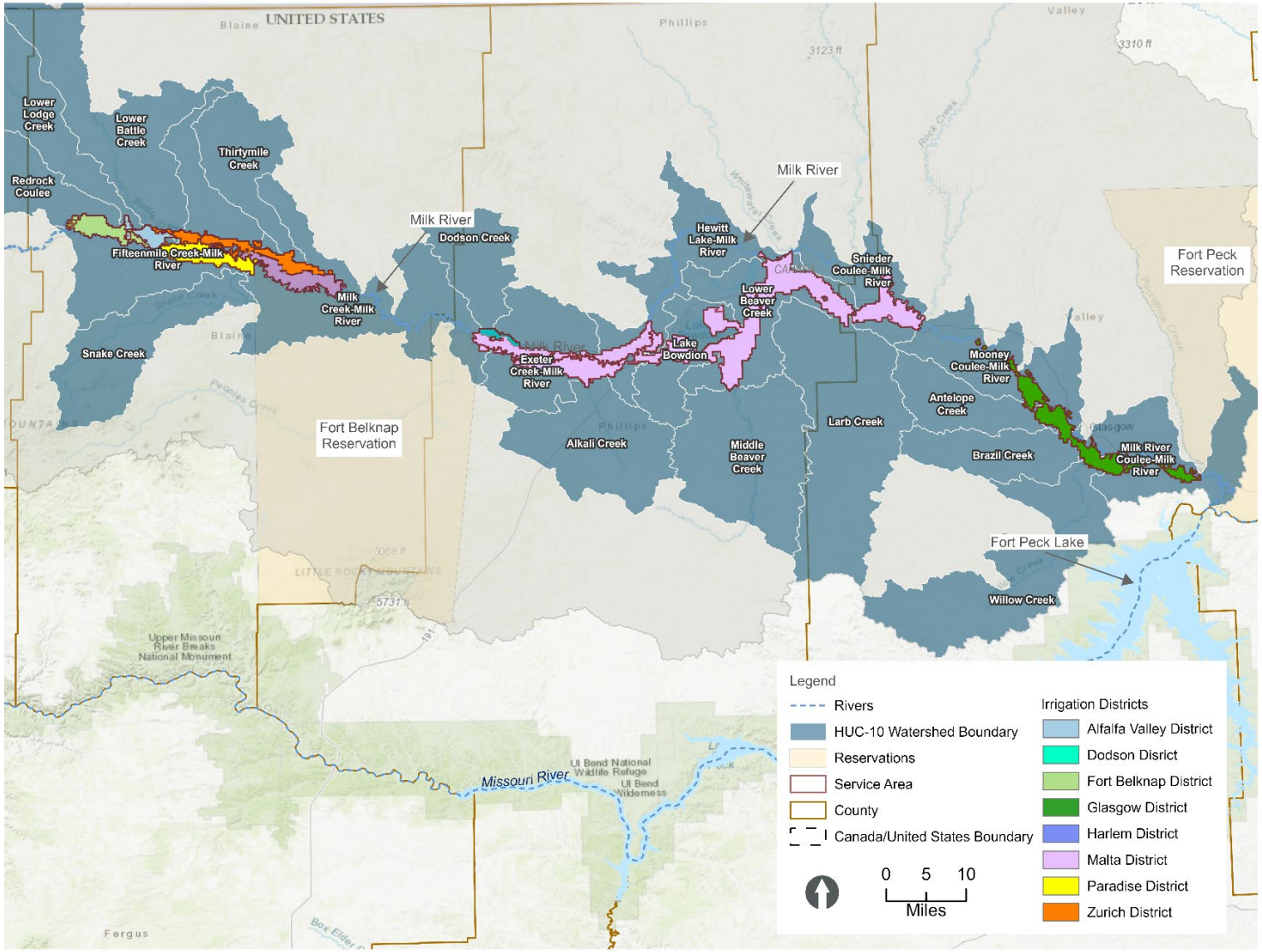

Figure 1-3. Subwatersheds Associated with the Service Area

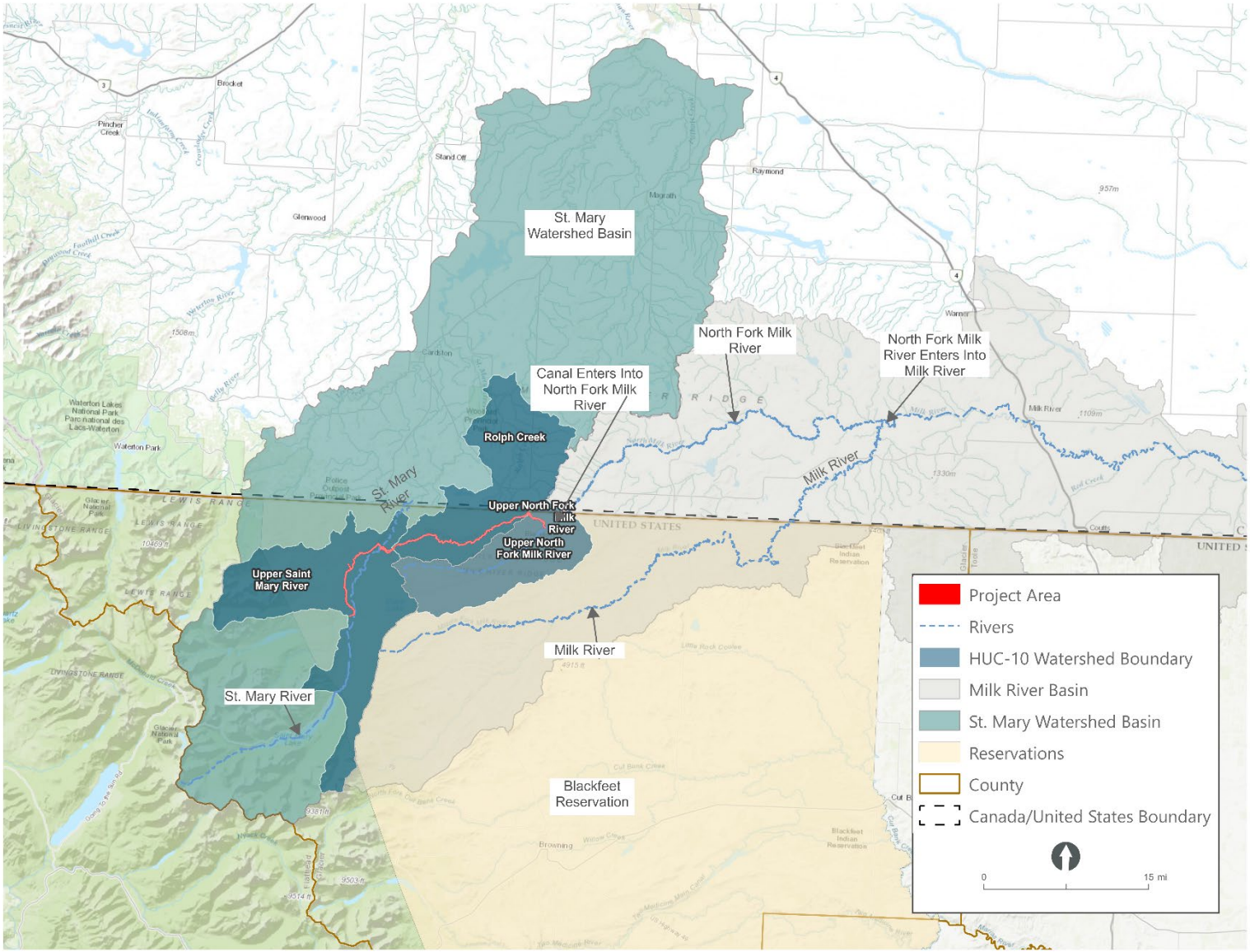

Figure 1-4. Subwatersheds Associated with the Project Area

2 Scope of the Plan-EIS

2.1 Agency, Tribal, and Public Outreach

Federal, State, and local agency representatives, as well as non-governmental organizations, received an invitation to participate in scoping for the project. Advertisements announcing the scoping period and associated scoping meeting were placed in local newspapers, as well as in multiple online locations, including NRCS and MRJBOC websites. Additionally, MRJBOC notified patrons of the scoping meeting and invited comments on the scope of the Draft Plan-EIS.

NRCS invited the Blackfeet Tribe to be a cooperating or participating agency for this Plan-EIS. A Memorandum of Understanding (MOU) was completed between the Blackfeet Tribe and NRCS for this project, and the Blackfeet Tribe accepted this role by signing the MOU.

In accordance with the National Historic Preservation Act of 1966 as amended (NHPA; 54 United States Code [U.S.C.] § 300320), and its implementing regulations found in 36 CFR § 800, NRCS initiated Section 106 consultation with the Blackfeet Tribe, Blackfeet Tribal Historic Preservation Office (THPO), Reclamation, MRJBOC, Bureau of Indian Affairs (BIA), and U.S. Army Corps of Engineers (USACE) on June 27, 2023. On May 9, 2024, the Montana State Historic Preservation Office (SHPO) was invited to participate in consultation, but SHPO declined further consultation in accordance with 36 CFR § 800.2(c)(2)(i). Section 106 consultation continued throughout 2024 and 2025, and on August 18, 2025, NRCS notified the Advisory Council on Historic Preservation (ACHP) of adverse effects on historic properties from selected project Alternatives in accordance with 36 CFR § 800.6(a)(1). ACHP declined further participation on August 25, 2025.

NRCS continues to coordinate with consulting parties to develop a Programmatic Agreement (PA) that would establish the process to identify, evaluate, treat, and resolve any adverse effects on historic properties associated with this project.

Per Executive Order (EO) 13007, Indian Sacred Sites, NRCS has consulted with the Blackfeet THPO to identify historic properties and traditional cultural properties in the project area. The Blackfeet THPO has indicated that the Milk River and Saint Mary systems lie at the heart of Blackfeet ancestral territory, and activities in these watersheds directly affect culturally significant landscapes, landforms, and traditional use areas. Consultation with the Blackfeet THPO remains ongoing as project effects become refined.

See Chapter 6 for additional documentation of agency, Tribal, and public outreach that has occurred during the Plan-EIS process.

2.2 Scoping Meeting

A scoping process enabled the identification of key concerns within the watershed, encompassing economic, environmental, cultural, and social aspects, as well as gathering information for the formulation of alternatives. The following coordination activities were executed as integral components of this scoping process:

- On June 23, 2023, NRCS and the contractor mailed and transmitted e-mail notices to federal, State, and local agencies and landowners along the St. Mary Canal System, as well as Milk River Project contract holders. The meetings were advertised in local newspapers and on the local radio station.
    - On July 13, 2023, the first scoping meeting was held at the Hooks Hideaway Motel in Babb, MT, from 12:00 p.m. to 1:30 p.m.
    - On July 18, 2023, the second meeting was held at the Best Western Plus Havre Inn & Suites in Havre, MT, from 11:30 a.m. to 12:30 p.m.
    - On July 18, 2023, the third meeting was held at the Great Northern Hotel in Malta, MT, from 4:30 p.m. to 5:30 p.m.

2.3 Scoping Comments

Presenters at the meetings included Robert Molacek, NRCS; Tom Watson, NRCS; Jennifer Patrick, MRJBOC; and Megan Christian, Farmers Conservation Alliance (FCA). The presentations covered the financial assistance available through P.L. 83-566, the project purpose and need, the Plan-EIS process, and how the public could get involved. After the presentations, attendees were provided an opportunity to ask questions and provide comments for the public record.

Scoping comments were accepted from June 21 through August 7, 2023. Comments were submitted via the following methods:

- At the public meetings
- Email – milkriver.project.comments@gmail.com
- Online – www.milkriverproject.com/projects/watershed
- Mail – Natural Resources Conservation Service, Alyssa Fellow, Environmental Compliance Specialist, Attention: St. Mary Canal Modernization Project, 10 East Babcock Street, Room 443, Bozeman, MT 59715
- Phone – NRCS, (406) 587-6712

Comments were received from:

- St. Mary River Irrigation District
- Montana Association of Conservation Districts
- Valley County Commissioner
- Blaine County Commissioner

- Malta Irrigation District
- Phillips Conservation District Chairman
- Montana Fish, Wildlife, and Parks
- Montana DNRC
- Public

Public feedback was sought to identify locally recognized issues. All comments submitted were given full consideration for applicability to the project scope; however, not all the comments and concerns expressed were relevant to the analysis of the project. Table 2-1 provides the predominant concerns noted by the public.

Table 2-1. Public Scoping Comment Summary

Comment Topic	Section Where Topic is Discussed
Canal and Road Repairs – The public suggests prioritizing lining on specific locations of the canal. Some feel that widening the road is unnecessary.	Section 4.2; Section 4.3.2; Section 4.3.3; Section 5.1.2; Section 5.2.2; Section 5.4.2; Section 5.5.2; Section 5.7.2; Section 5.8.2; Section 5.9.2; Section 5.10.2; Section 5.10.3
Communication with Stakeholders – The public wants to ensure that municipal interests are being considered and that efforts are made to collaborate with local farmers and irrigation authorities.	Section 2.1; Section 2.2; Section 2.3; Section 6.1; Section 6.1.1; Section 6.1.2, Section 6.1.3
Fish Habitat – Concerns were voiced about sedimentation and fish habitat loss with increased flows above the Fresno Reservoir.	Section 4.4; Section 5.4.2; Section 5.5.1; Section 5.5.2; Section 5.5.3; Section 5.10.2; Section 5.10.3
Reservoir – The public suggests exploring opportunities to upgrade existing reservoirs and model impacts of increased flow.	Section 5.4.2; Section 5.4.3; Section 5.10.2; Section 5.10.3
Surface Water and Groundwater – The public is concerned that lining will affect crops, wells, ponds, and springs. Additionally, they suggest taking measures to reduce turbidity in the Milk River during project construction. The public inquired if the Milk River would ever go dry as a result of the project construction.	Section 4.3.2; Section 4.3.3; Section 4.4; Section 5.1.2; Section 5.1.3; Section 5.3.1; Section 5.3.2; Section 5.4.2; Section 5.9.2; Section 5.10.2; Section 5.10.3
Wildlife – The public expressed concern for the potential effects of the project on water available for wildlife and cattle, as well as the potential effects on the wellbeing and habitat of endangered species, especially Montana Species of Specific Concern and Species of Greatest Conservation Need.	Section 3.5.2; Section 3.5.4; Section 3.5.5; Section 3.5.6; Section 5.1.2; Section 5.1.3; Section 5.4.2; Section 5.5.1; Section 5.5.2; Section 5.5.3; Section 5.10.2; Section 5.10.3

2.4 Identification of Resource Concerns

Following the conclusion of the public scoping phase on August 7, 2023, the interagency project team reviewed the issues raised by the public. This feedback helped to refine and prioritize the

list of resource concerns for the project. The concerns were evaluated according to their alignment with the project's objectives, as outlined in Section 1.2, Purpose and Need for the Project. Any potential resource concerns deemed of low or no significance to the project after the scoping phase were excluded from subsequent analysis. The stakeholder list, public invitation materials, and summary of scoping comments and responses from the three scoping meetings are included in Appendix A2.

NRCS NWPM Section 501.24 requires consideration of the concerns listed in Table 2-2.

Table 2-2. Summary of Resource Concerns

ITEM/CONCERN	RELEVANT TO THE PROPOSED ACTION (YES/NO)	RATIONALE
Soil-Related Concerns	**Relevant to the Proposed Action (Yes/No)**	**Rationale**
Soil Resources	Yes	Operation of the project could affect erosion and sedimentation.
Prime and Unique Farmland, and Farmland of Statewide or Local Importance	Yes	Farmland of statewide importance occurs in the project area and could be affected by the proposed action. The project would consider providing the allocated water rights to the prime and unique farmland and farmland of statewide importance in the service area.
Water-Related Concerns	**Relevant to the Proposed Action (Yes/No)**	**Rationale**
Water: Surface Water Quantity	Yes	The project could affect surface water quantity.
Water: Water Rights	No	The project would not change the appropriated water rights. The project could affect the ability to deliver appropriated water rights.
Water: Water Quality	Yes	The project could affect water quality.
Water: Groundwater Quantity, Aquifer Recharge	Yes	Construction and operation of the project could affect groundwater and unconsolidated aquifer recharge.
Sole Source Aquifers	No	No sole source aquifers are present in or near the project area (USEPA 2024a).
Wetlands	Yes	Wetlands are present throughout the project area. Construction of the project would have permanent and temporary, direct and indirect effects on wetlands.

ITEM/CONCERN	RELEVANT TO THE PROPOSED ACTION (YES/NO)	RATIONALE
Floodplain Management	Yes	No FEMA-designated floodplains occur along the St. Mary Canal System; however, unmapped floodplains occur along the St. Mary Canal System. Downstream floodplains have the capacity to retain the increased flows associated with the proposed action during high water levels. St. Mary Canal System failure would result in emergency flooding.
Coastal Zone Management Areas	No	No coastal zones are located near the project or service area (USGS 2024).
Water of the U.S., Wetlands, & Special Aquatic Sites	Yes	The project could affect waters of the U.S. and wetlands.
Coral Reefs	No	No coral reefs are located near the project or service area (USGS 2024).
Regional Water Resource Plans (including coastal plans)	Yes	The project is part of a larger planning effort to increase water supply reliability.
Wild and Scenic Rivers	No	There are no wild and scenic river designations within the project area or service area that the project could affect.
Air-Related Concerns	**Relevant to the Proposed Action (Yes/No)**	**Rationale**
Air Quality	No	Review of Montana Department of Environmental Quality (DEQ) air quality data indicates that the entire project and service areas are in attainment for all criteria pollutants (Montana DEQ 2024). Emissions from equipment associated with construction activities would occur; however, such emissions are considered negligible.
Plant and Animal-Related Concerns	**Relevant to the Proposed Action (Yes/No)**	**Rationale**
Endangered and Threatened Species	Yes	Federally listed species have the potential to be within the project area and be affected by the project.
Migratory Birds	Yes	Migratory birds could occur within the project area.
Bald and Golden Eagles	Yes	Eagles could occur within the project area.

ITEM/CONCERN	RELEVANT TO THE PROPOSED ACTION (YES/NO)	RATIONALE
Essential Fish Habitat	No	Essential Fish Habitat is not designated for this segment of the St. Mary River (75 FR 200, 2010).
Ecologically Critical Areas	No	The project area does not cross through any ecologically critical areas.
Invasive Species	Yes	Noxious weeds are known to occur within the project area, and construction activities would increase the risk of introduction/spread.
Fish and Wildlife (including coordination requirements)	Yes	The St. Mary Canal System is not managed as fish habitat. Fish species downstream on the Milk River may benefit due to the diverted water. Fish populations within the vicinity of the project may experience minor, temporary impacts due to water quality impacts during construction. Indirect impacts caused by reducing seepage from the canal may have minor impacts on nearby habitat for both aquatic and terrestrial species. Terrestrial species are anticipated to experience temporary impacts during construction of the project due to noise, ground disturbance, increased presence of humans, etc. Minor permanent impacts on some species within the study area may occur due to habitat conversion associated with the project.
Natural Areas	No	No federal, State, or locally designated natural areas are in or near the project area.
Riparian Areas	Yes	Project construction activities or changes in water levels could affect riparian areas.
Forest Resources	Yes	The project would impact forested habitat along the first 9-miles of the project near the southern end of the St. Mary Canal System. These areas would include both temporary and permanent impacts due to tree/vegetation removal and dirt work. These forested areas are not harvested for timber.
Human Use-Related Concerns	**Relevant to the Proposed Action (Yes/No)**	**Rationale**

ITEM/CONCERN	RELEVANT TO THE PROPOSED ACTION (YES/NO)	RATIONALE
Historic Properties, Cultural Resources, and Tribal Consultation	Yes	Consultation with the Blackfeet Tribe, Blackfeet THPO, MRJBOC, Reclamation, BIA, and USACE was completed for compliance with Section 106 of the NHPA.
Social Issues	Yes	The project crosses the Blackfeet Reservation. The project requires ROW acquisition of trust land on the Blackfeet Reservation. The project would result in temporary impacts on the Blackfeet Tribe during construction.
Local, Regional, and National Economy	Yes	The project involves an expenditure of public funds that could affect the local and regional economy. An evaluation of the effects of providing NRCS funding is included.
Public Health and Safety	Yes	The project could affect drowning risk in open canals and during flood events. The project would reduce the risk of canal breach or failure that can cause flash flooding on adjacent property.
Scenic Beauty	Yes	Glacier National Park and Highway 89 parallel the first 7 miles of the project. Highway 89 would be traveled for construction. Highway 89 provides access to MT 17 (Chief Mountain Highway), which is a scenic drive to Waterton Park in Canada, as well as Chief Mountain.
Parklands (including National Parks, Monuments, and Historical Sites)	Yes	The project occurs parallel to Glacier National Park. No parklands, national parks, or monuments are within the project area.
Significant Scientific Resources	No	Scientific resources would not be affected by the project.
Land Use	Yes	Construction and operation of the project could affect land use.
Scoped Ecosystem Services of Concern	**Relevant to the Proposed Action (Yes/No)**	**Rationale**
Provisioning	Yes	Construction and operation of the project could affect provisioning services.
Regulating	Yes	Construction and operation of the project could affect regulating services.
Cultural	Yes	Construction and operation of the project could affect cultural services.

ITEM/CONCERN	RELEVANT TO THE PROPOSED ACTION (YES/NO)	RATIONALE
Other Concerns Identified by SLO, Agencies, and the Public	**Relevant to the Proposed Action (Yes/No)**	**Rationale**
National Economic Efficiency (NEE)	Yes	An NEE analysis has been completed, as required by PR&G Interagency Guidelines.

2.5 Milk River Project Current Projects

The planned actions for the Milk River Project are identified by Reclamation and MRJBOC. The actions include the reconstruction of the St. Mary Diversion Dam Replacement project, which is now complete, and the Fresno Safety of Dams Modification project, which is currently being completed. The St. Mary Diversion Dam Replacement project included all the activities required to design, construct, and closeout the construction of a new diversion dam and fish protection structure. The Fresno Safety of Dams Modification project includes the installation of a state-of-the-practice sand filter and toe drain system with an embankment fill overlay on the downstream side of the dam, with a vertical sand filter trench at the bottom of the excavation.

Reclamation, NRCS, and MRJBOC determined that these planned actions were not dependent on actions within this Plan-EIS and not part of the scope of this project. NEPA actions completed for this project include the St. Mary Diversion Dam Replacement Project Finding of No Significant Impact (FONSI) and Final Environmental Assessment (EA) that was issued in June 2023 and the Fresno Reservoir Safety of Dams Modification FONSI and Final EA that was issued in September 2021. Additional descriptions of these actions and others, as well as past actions and reasonably foreseeable future actions that could occur, have been included under Section 5.13.2, Current and Reasonably Foreseeable Future Actions.

While this Plan-EIS was being developed in June 2024, the St. Mary Siphon failed catastrophically. Reclamation and MRJBOC decided to complete the St. Mary Siphon Replacement and Halls Coulee Siphon Replacement through two separate emergency projects. In July 2024, Reclamation issued a FONSI and EA for the St. Mary Siphon and Bridge Replacement and River Restoration. Reclamation also completed a FONSI and EA for the Halls Coulee Siphon replacement. Both projects will be completed in 2026.

3 Affected Environment

This chapter describes the existing ecological, physical, biological, economic, and social resources within the identified areas. For the identification of the resources, the planning area was broken into two distinct boundaries and given the following naming:

- *Project Area*: The project area is the area that includes the full construction footprint of the alternatives considered in this Plan-EIS, including the permanent and temporary impact areas (Figure 3-1). The total acreage of the project area is 1,152.8 acres.
- *Service Area*: The service area is the area experiencing the agricultural damages due to the unreliable access to the St. Mary River water. No construction would occur within the service area, but the benefitted users of the St. Mary River water need to be considered as part of this Plan-EIS. The service area includes eight irrigation districts, private irrigators, and several municipalities within Hill, Blaine, Phillips, and Valley Counties. The service area also includes Fresno Reservoir (Figure 3-2). The total acreage of the service area is 203,990.5 acres.

For each resource, a study area was identified for analysis, as listed in Table 3-1. The study area for all resources includes the project area or a buffer around the project area. As described in Table 3-1, the study area for some resources was expanded to include the service area.

Table 3-1. Affected Environment Study Areas by Resource

Resource	Study Area	Justification
Land Use	Project Area and Service Area	To consider the land use within the project and service areas, which is along the 165-mile stretch of the Milk River in Hill, Blaine, Phillips, and Valley Counties.
Soils	Project Area	Soils in the service area would not be affected by the alternatives.
Prime and Unique Farmlands	Project Area and Service Area	Because the alternatives could have beneficial impacts on farmland in the Milk River watershed, the study area was expanded to include the service area.
Water Resources	Project Area; 0.5-mile buffer on either side of the St. Mary Canal System; other waters associated with the Milk River Project	Study area is a buffer of the project area to focus on the construction and direct impacts that the project could cause on wetlands, groundwater, and surface waters. The effects of the additional flow within the service area are anticipated to be negligible. Waters of the Milk River Project, such as Fresno Reservoir, are discussed, as appropriate, to identify the effects of the project.

Resource	Study Area	Justification
Terrestrial and Aquatic Species	Project Area; specifically, a 0.5-mile buffer on either side of the St. Mary Canal System	Study area is a buffer of the project area to focus on the construction impacts and permanent effects the project could have on general wildlife, threatened and endangered species, and habitat.
Historic Properties and Cultural Resources	The APE, defined as the area where direct and indirect effects could occur on historic properties and cultural resources (36 CFR § 800.16(d))	See detailed information on the extent of the APE in Section 3.6.
Visual Resources	Project Area; specifically, a 1-mile buffer on either side of the project area	A 1-mile buffer was chosen to account for potential impacts that may be visible from higher elevation areas within the vicinity of the project area.
Public Safety	Project Area; specifically, a 1-mile buffer on either side of the project area	A 1-mile buffer was chosen to account for flooding effects if the No-Action Alternative would occur.
Socioeconomic Resources	Project Area and Service Area	Study area expanded to include the service area because of the effects that lack of St. Mary River water has on the area.

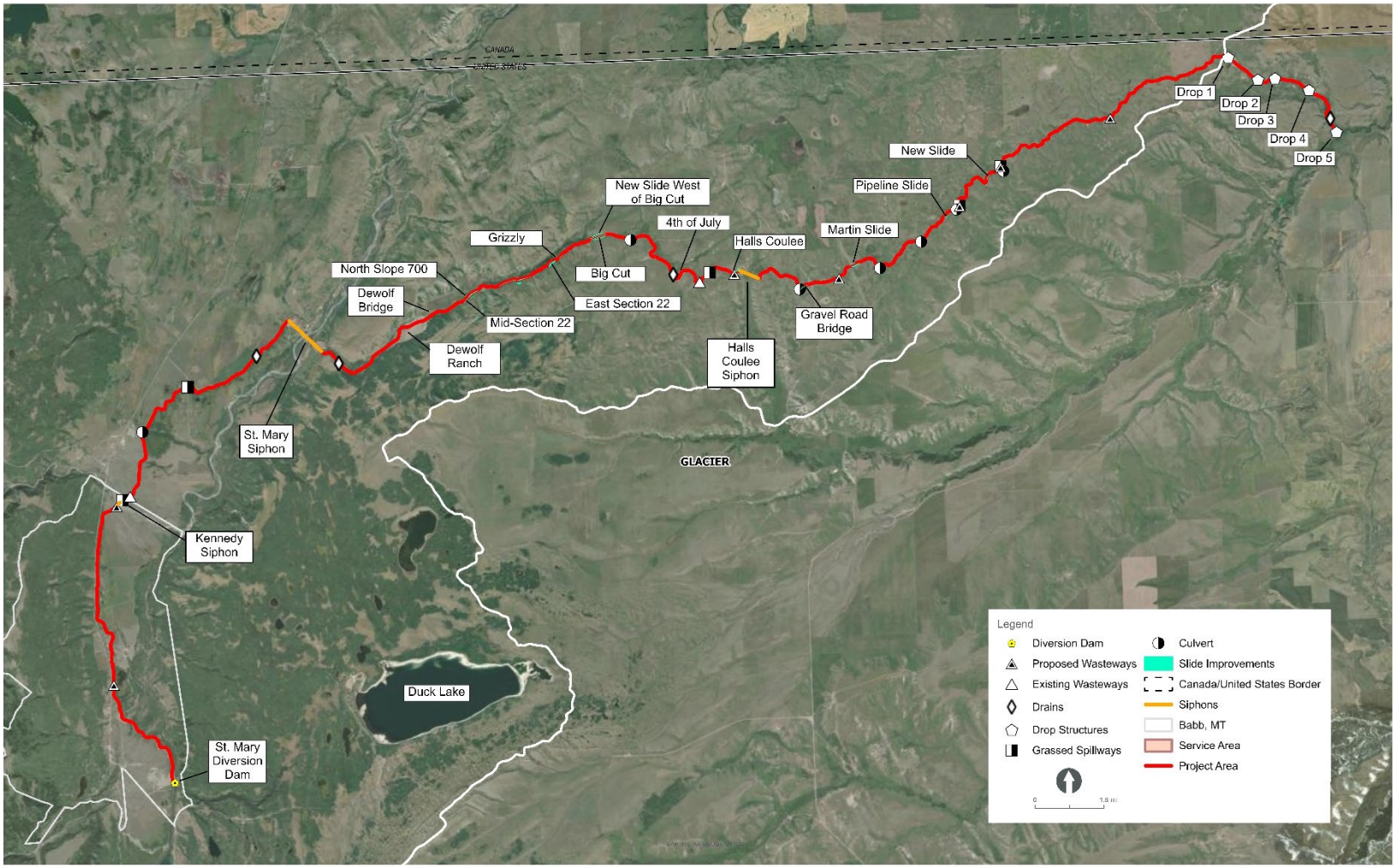

Figure 3-1. Project Area

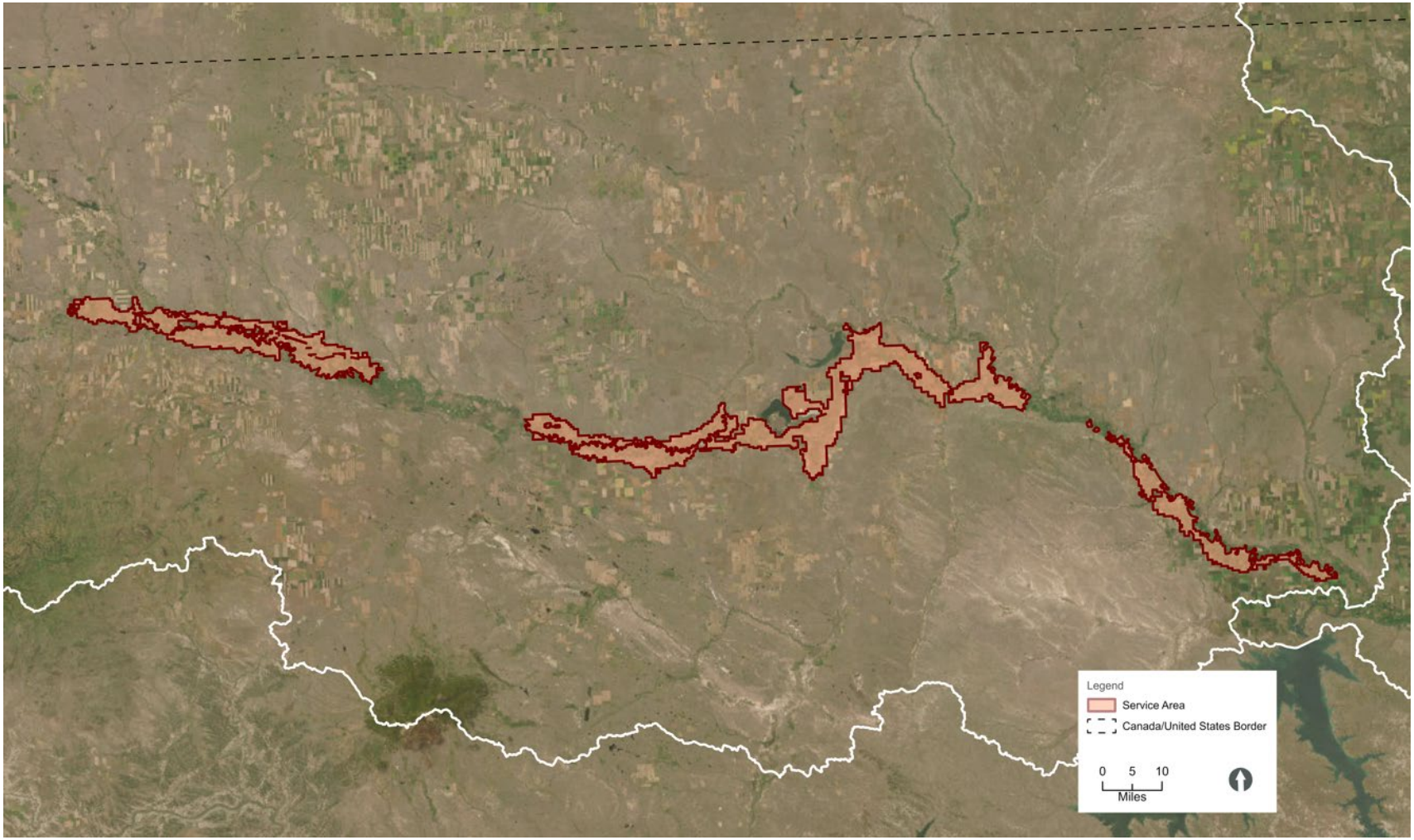

Figure 3-2. Service Area

3.1 Land Use

The study area identified to analyze land use includes the project area and service area. The project area allows a focus on the land use and ownership adjacent to the St. Mary Canal System in Glacier County, while the service area considers the land use that receives St. Mary River water in Hill, Blaine, Phillips, and Valley Counties. The study area evaluated for recreational resources includes both the project area and the service area. The project area provides opportunities for hunting, fishing, and wildlife viewing, including bird watching.

3.1.1 Land Use and Ownership

No land use information is available directly from Glacier County. Glacier County is not a zoned County and does not have designated land uses through zoning (Glacier County 2024). For this reason, the 2021 National Land Cover Database (NLCD)—which is published by USGS in association with the Multi-Resolution Land Characteristics (MRLC) Consortium, a consortium of federal agencies who coordinate and generate consistent and relevant land cover information at the national scale (Dewitz and USGS 2021)—was used as a surrogate to inform the analysis of land use in the project area (Figure 3-3). The Blackfeet Climate Change Adaptation Plan notes that rangeland, forestry, and agriculture are the main land uses on the Reservation (Blackfeet Nation 2018a) and supports this approach for characterizing land use. Similar to the project area, NLCD land cover data was used as a surrogate measure for describing land use across the geographic extent of the service area because zoning information was not available. Technical reports are referenced to provide quantities (acres) of land that are irrigated by water delivered through the St. Mary Canal System.

A review of the NLCD revealed that land use within the project area is primarily agricultural, including cultivated crop production, pasture/hay, grassland/herbaceous, and shrub/scrub, the latter three of which are used presumably for livestock production (grazing) areas (Table 3-2). The cultivated crops are mainly barley and peas (see Appendix D5). The St. Mary Canal System is included within the designation of agriculture in the NLCD layer; this layer was used as the most recent information available for land use. Agriculture accounts for 68.5 percent of the project area, with shrub/scrub land as the most common type of agricultural land. Other land uses, in order of prevalence, include water/wetlands (184.1 acres; 16.0 percent of project area); developed land (99.0 acres; 8.6 percent of project area); and forested areas (79.6 acres; 6.9 percent of project area). The forested areas within the project area are not harvested for timber.

According to the NLCD, agriculture is also the primary land use (87 percent) in the service area, followed by water/wetlands (9.8 percent). In the service area, most agricultural use is for cultivated crops. Land use in the planning area (the combined project area and service area) is also predominantly cultivated crops.

Some areas within the four counties of the service area, such as the towns of Havre, Chinook, Harlem, and North Havre, have residential, commercial, and industrial uses (Figure 3-5).

Diverted water is used primarily for irrigation to support agricultural production (Reclamation 2021). Irrigated lands are concentrated along the Milk River in north central Montana between the Fresno Reservoir and the confluence of the Milk and Missouri Rivers near the Fort Peck Reservoir. The diversion of St. Mary River water into the St. Mary Canal System contributes to 140,404 acres of irrigated area (Table 1-1). Entities that irrigate agricultural lands include: (1) irrigation districts, (2) district pumpers, (3) river pumpers, and (4) private lands irrigators.

A full breakdown of land use, classifications, and acreage for the project area, the service area, and the planning area is provided in Table 3-2.

Table 3-2. Land Use within the Project Area, Service Area and Planning Area

Land Use Cover Type	Project Area (acres)	Service Area (acres)	Planning Area (acres)
Cultivated Crops	2.8	82,605.2	82,608.0
Pasture/Hay	11.2	38,106.6	38,117.8
Grassland/Herbaceous	319.3	43,715.2	44,034.5
Shrub/Scrub	456.5	12395.4	12,851.9
Barren Land (Rock/Sand/Clay)	0.3	503.8	504.1
Developed	99.0	6,532.5	6,631.5
Forested	79.6	213.6	293.2
Water/Wetlands	184.1	19,918.2	20,102.3
Total	1,152.8	203,990.5	205,143.3

Source: NLCD: Dewitz, J., and U.S. Geological Survey. 2021.

The project area is located within the Blackfeet Reservation. The project area is within a designated corridor through either right-of-way (ROW) or easements and is approximately 300 feet wide (150 feet on either side of the St. Mary Canal System centerline). The project area crosses land that is held in trust for the Blackfeet Tribe, privately held, or federally owned; this includes land owned by 25 different landowners. Landownership within the project area was calculated, and the results are provided in Table 3-3. USFWS holds easements in land adjacent to the project area (Figure 3-4). Each easement has its encumbrances. Some protect grasslands, wetlands, or both, while others have additional encumbrances that limit or prohibit developments, such as feedlots, windfarms, subdivisions, etc. Water from the St. Mary Canal System is not currently used for irrigation adjacent to the project area.

Land ownership within the project area is nearly equally divided between private and federal (Table 3-3). Most of the land within the service area is privately owned (see Figure 3-6).

Table 3-3. Land Ownership within the Project and Service Areas

Land Ownership	Acres within Project Area	Percentage	Acres within Service Area	Percentage
Federal: Reclamation	235.2	20.4	9.492.0	4.7
Federal: Bureau of Land Management	0.0	0.0	5,084.3	2.5

Land Ownership	Acres within Project Area	Percentage	Acres within Service Area	Percentage
Federal: U.S. Fish and Wildlife Service	0.0	0.0	8,567.8	4.2
Federal*	0.0	0.0	26.0	<0.01
Tribal Trust Land: Blackfeet Reservation	315.2	27.3	0.0	0.00
Blackfeet Tribe	43.7	3.8	0.0	0.0
Tribal Trust Land: Fort Berthold Reservation	0.0	0.0	35.2	<0.01
Private	551.8	47.9	172,369.2	84.5
State or Local Government	6.9	0.6	8,416.1	4.1
Total	1,152.8	100	203,990.5	100.0

*No specific agency identified for land ownership within available desktop information.

3.1.2 Recreational Resources

Formally designated recreational resources do not exist within the project area; however, the canal is used by Tribal members for fishing. Three campgrounds are within approximately 0.5 mile of the project area and are open primarily during the summer: Leaning Tree Café and Campground, Glacier Elkhorn Cabins and Campground, and Piegan Crossing RV Park and Campground. Chewing Black Bones Campground is approximately 1.3 miles south of the St. Mary Diversion Dam and is managed by the Blackfeet Tribe.

Notable recreational resources within or adjacent to the service area include the Fresno Reservoir, Milk River, and Nelson Reservoir. These resources offer opportunities for swimming, camping, fishing, boating, wildlife observation, hiking, and cross-country skiing, among others. Terrestrial recreational opportunities along the Milk River and its associated water bodies include camping, picnicking, hiking, wildlife viewing, horseback riding, and hunting. Hunters within the study area largely hunt deer, elk, and waterfowl (Reclamation 2021).

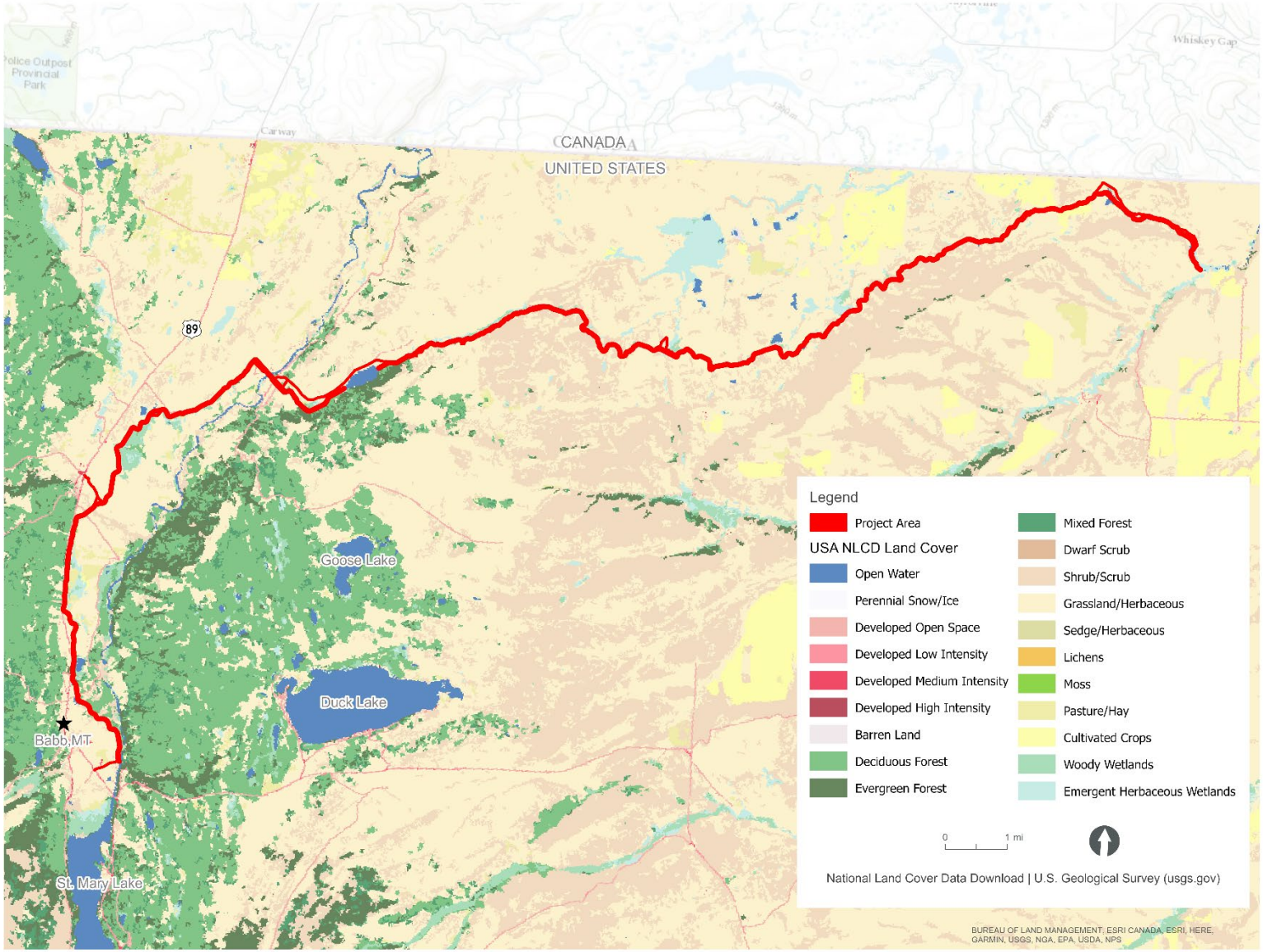

Figure 3-3. Land Cover in Project Area

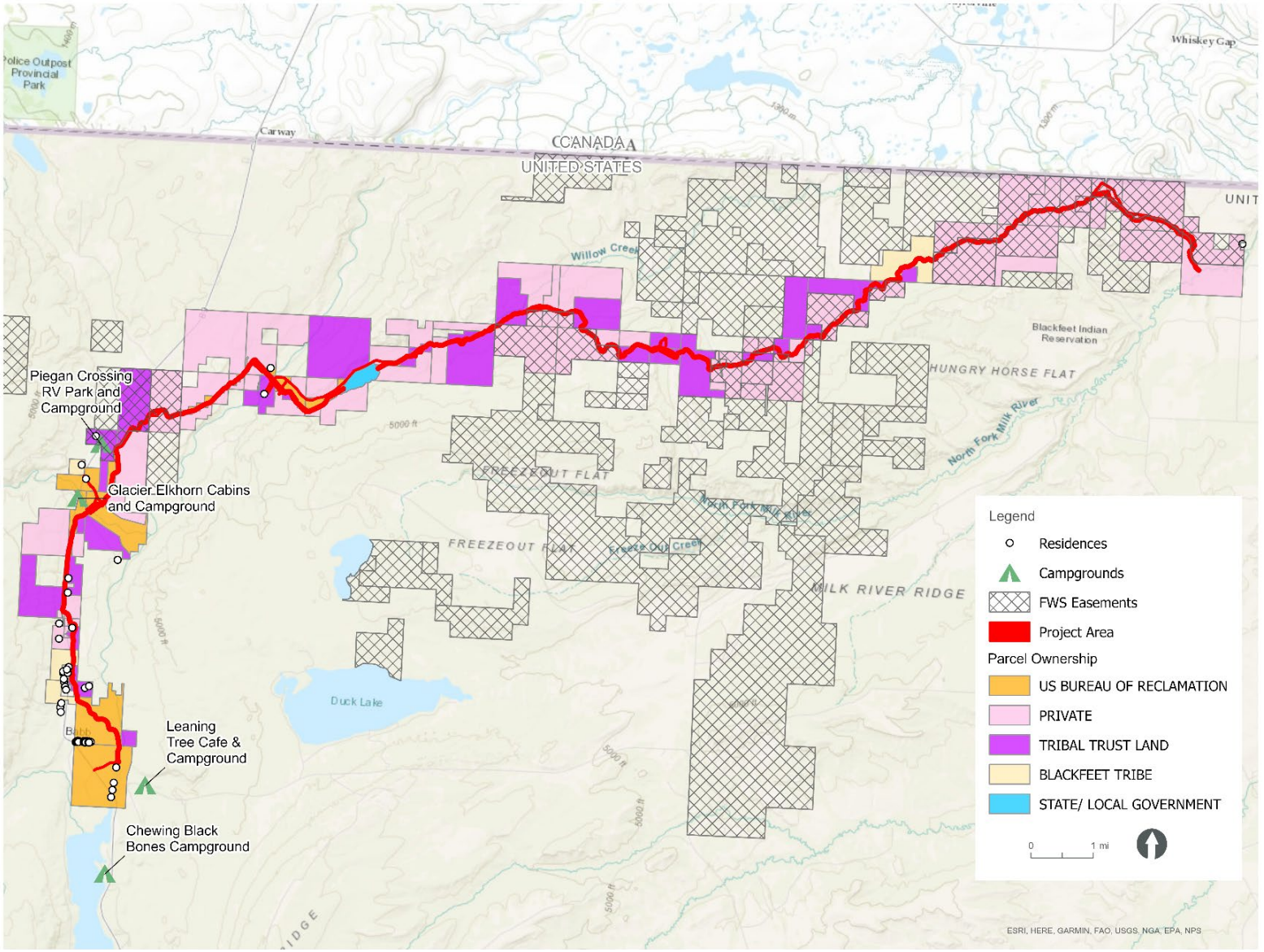

Figure 3-4. Land Ownership in Project Area

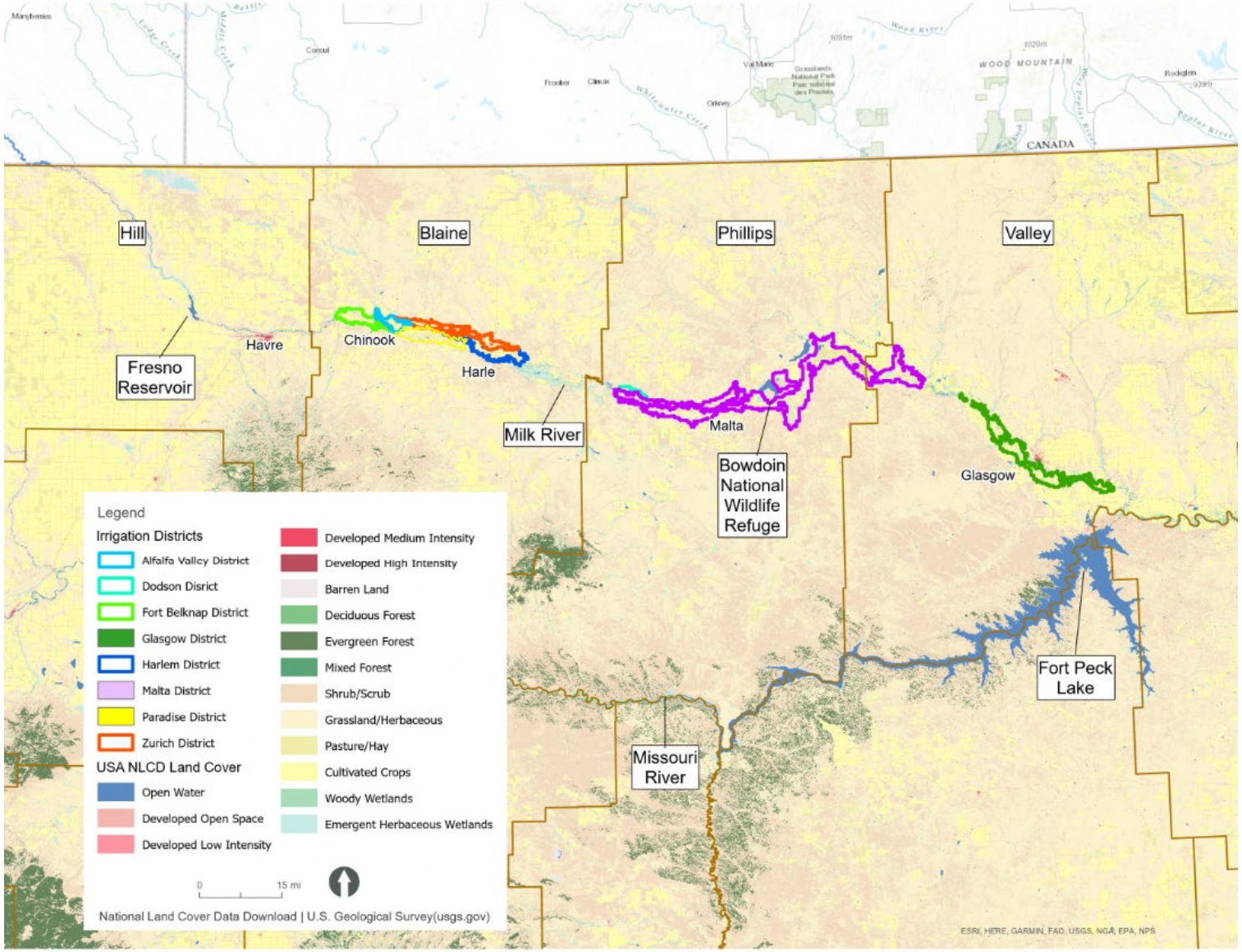

Figure 3-5. Land Cover in Service Area

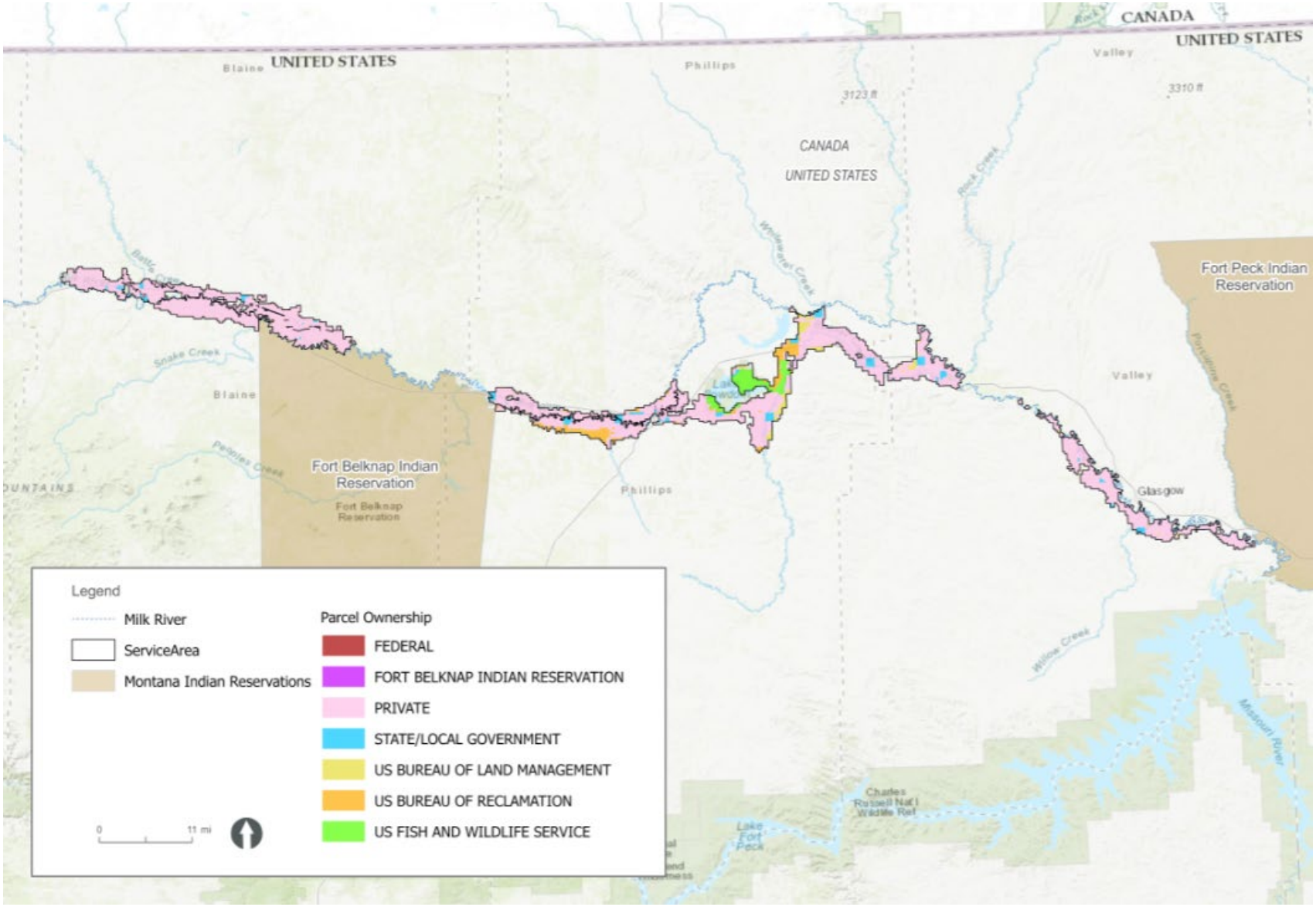

Figure 3-6. Land Ownership in Service Area

3.2 Soils

The study area for soils is the project area because this is the area that would have the potential to be affected directly and indirectly by project construction and implementation. Soil characteristics within the project area were reviewed to inform the following sections. These qualities include soil density, permeability, strength, compressibility, and its reaction/relationship with water. Other soil properties were reviewed, including depth to restrictive layer (or bedrock) and depth to water table.

3.2.1 Soils

According to the NRCS Web Soil Survey, 23 soil types are present within the project area. Table 3-4 shows the soil types present in the project area and soil properties that have the potential to affect earthwork and water conveyance or loss. Many of the soils present are associated with gently sloped areas and 0 to 4 percent slopes and are rated either not hydric or minimally hydric. As shown in Table 3-4, many of the soils within the project area are within hydrologic soil groups B and C, which are defined below. These two hydrologic soil groups indicate that the area generally has moderate to slow infiltration rates, which have higher rates of runoff potential.

- **Group A** – Soils with high infiltration rates (low runoff potential) even when thoroughly wetted. These consist chiefly of deep, well-drained sands and gravels. These soils have a final infiltration rate greater than 0.30 in/hr (7.6 mm/hr).
- **Group B** – Soils in this group have a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have a moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
- **Group C** – Soils in this group have a slow infiltration rate when thoroughly wet. These soils consist of a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Table 3-4. Properties of Soil Groups in the Project Area

Soil Name	Percent of Project Area	Hydrologic Soil Group	Wind Erodibility Group	Depth to Bedrock (inches)	Depth to Water Table (inches)
AB – Adel-Babb complex, hilly	0.9	B	6	>80	>80
AF – Fifer-Adel association, hilly	6.3	C	6	10 - 20	>80
Bb – Babb cobbly loam, gently rolling	0.3	B	7	>80	>80

Soil Name	Percent of Project Area	Hydrologic Soil Group	Wind Erodibility Group	Depth to Bedrock (inches)	Depth to Water Table (inches)
BC – Babb cobbly loam, hilly	7.4	B	7	>80	>80
Bd – Babb sandy loam, sandy subsoil variant, undulating	2.4	B	3	>80	>80
BF – Babb-Hanson complex, hilly	8.5	B	7	>80	>80
BG – Babb sandy loam, sandy subsoil variant, hilly	0.0	B	3	>80	>80
Bg – Bearmouth gravelly loam, 0 to 4 percent slopes	5.4	B	6	>80	>80
Bu – Burnette loam, undulating	0.7	C	6	>80	>80
FU – Fifer-Cheadle-Rock outcrop complex, very steep	0.5	C	6	10 - 20	16 - 24
Gp – Gravel pits	0.2	-	-	-	-
Le – Leavitt complex, undulating	14.4	B	5	>80	>80
LF – Leavitt complex, hilly	22.4	B	7	>80	>80
MZb – Mixed alluvial land	1.1	-	-	-	-
PH – Pishkun-Adel association, steep	5.1	B	6	>80	>80
Ro – Rhoades complex	0.8	C	6	48 - 60	60 - 72
RS – Riverwash	0.7	-	-	-	-
RT – Rock outcrop	0.7	-	-	-	-

Soil Name	Percent of Project Area	Hydrologic Soil Group	Wind Erodibility Group	Depth to Bedrock (inches)	Depth to Water Table (inches)
SA – Saline land	1.3	-	4L	-	-
SP – Seeped alluvial land	0.2	-	-	-	-
TN – Tinsley soils	3.9	A	5	>80	>80
W – Lakes and streams	1.4	-	-	-	-
WF – Wet land	15.6	C	5	>80	>80

Source: NRCS 2024

Particulate matter (PM) emissions from soils can occur when winds or machinery cause disturbance to the soil surface. Wind erosion and actions of machinery can cause a degradation in soil quality, including loss of topsoil, erosion, and deposition of soil in undesirable locations. Soils within the project area are not rated as highly susceptible to wind erodibility. As shown in Table 3-4, many of the soil groups within the study area were identified as 6 or 7 on the Highly Erodible Land (HEL) scale. The HEL scale ranges from 1 to 8, with 1 being highly susceptible to erosion and 8 being the least susceptible to wind erosion (NRCS 2013).

There are numerous areas of documented erosion along the St. Mary Canal System within the project area. Erosion within the St. Mary Canal System can be caused by several factors (with several being correlating factors of landslides) and may include steep bank slope angles, sharp bends in the alignment, currents/waves, canal seepage, siphon leaks, and hoofed livestock/wildlife. Erosion of banks along the canal can lead to increased risk of landslides in both previously documented landslide locations and new locations. Seepage from siphons has been documented to be problematic in previous geotechnical reports (TD&H 2008; MRJBOC 2022). Extensive repair work has been conducted previously on siphon joints; however, repairs have not solved the problem of leakage/seepage from the siphons, which then causes soil instability around the siphon supports. Instability in valley sidewalls near siphons has led to downslope movement of the steel barrels and concrete supports producing buckling in the siphon barrels and compression of the expansion/contraction joints (see Appendix D3). Erosion (both subgrade and internal) contributed to the 2020 Drop Structure 5 failure (Terracon 2020).

Soil groups with a shallow depth to bedrock have limited infiltration, a higher erosion risk, and can affect the ease of earthwork activities. While many of the soil groups in the project area have a depth to bedrock greater than 80 inches, approximately 7 percent of the soil groups in the project area have shallow bedrock at a depth of 10 to 20 inches. Approximately 95 percent of soil groups in the project area have a depth to water table greater than 80 inches, indicating that the project area is likely to have well-drained soils with a low risk of flooding.

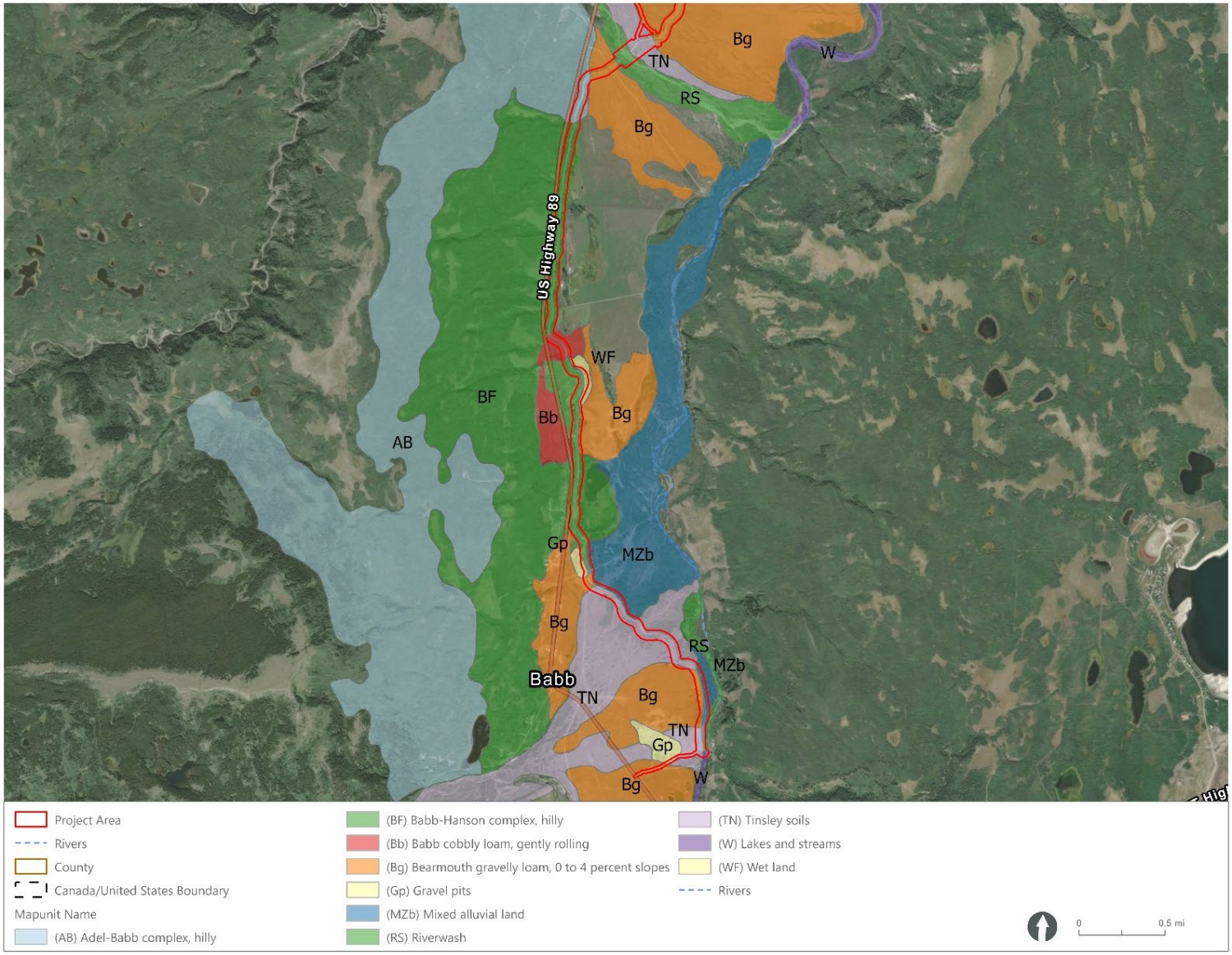

Figure 3-7. Soils in the Study Area (1 of 4)

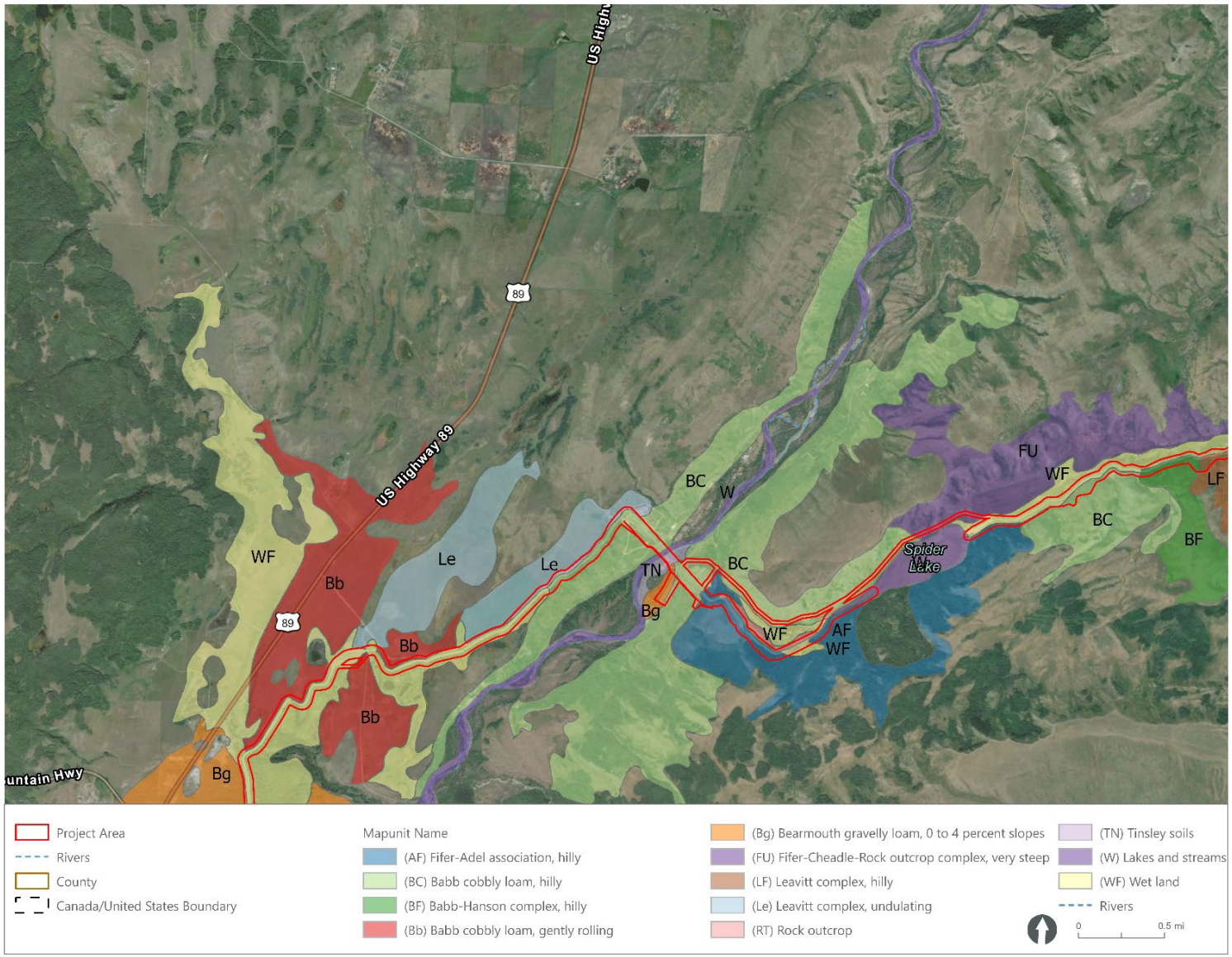

Figure 3-8. Soils in the Study Area (2 of 4)

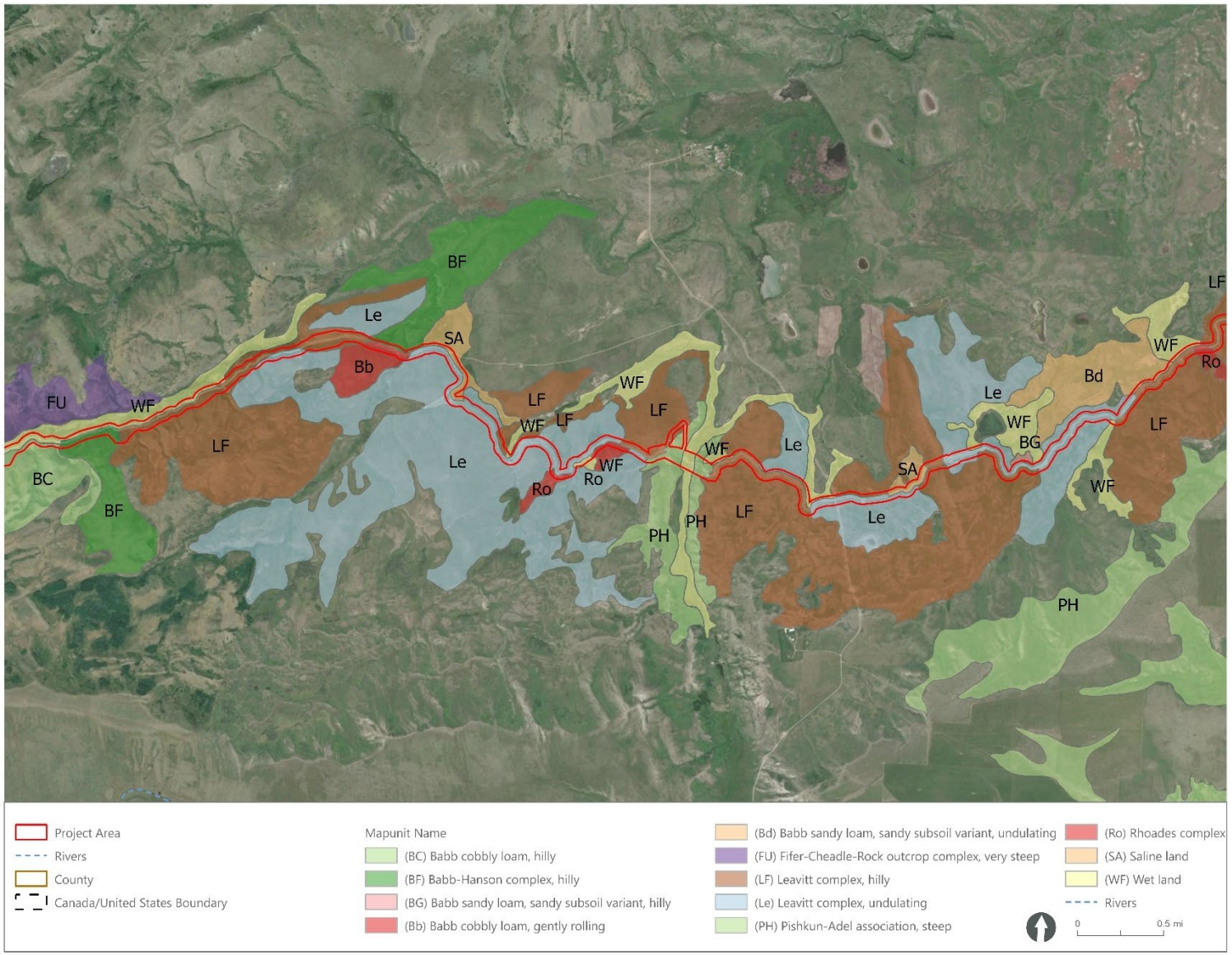

Figure 3-9. Soils in the Study Area (3 of 4)

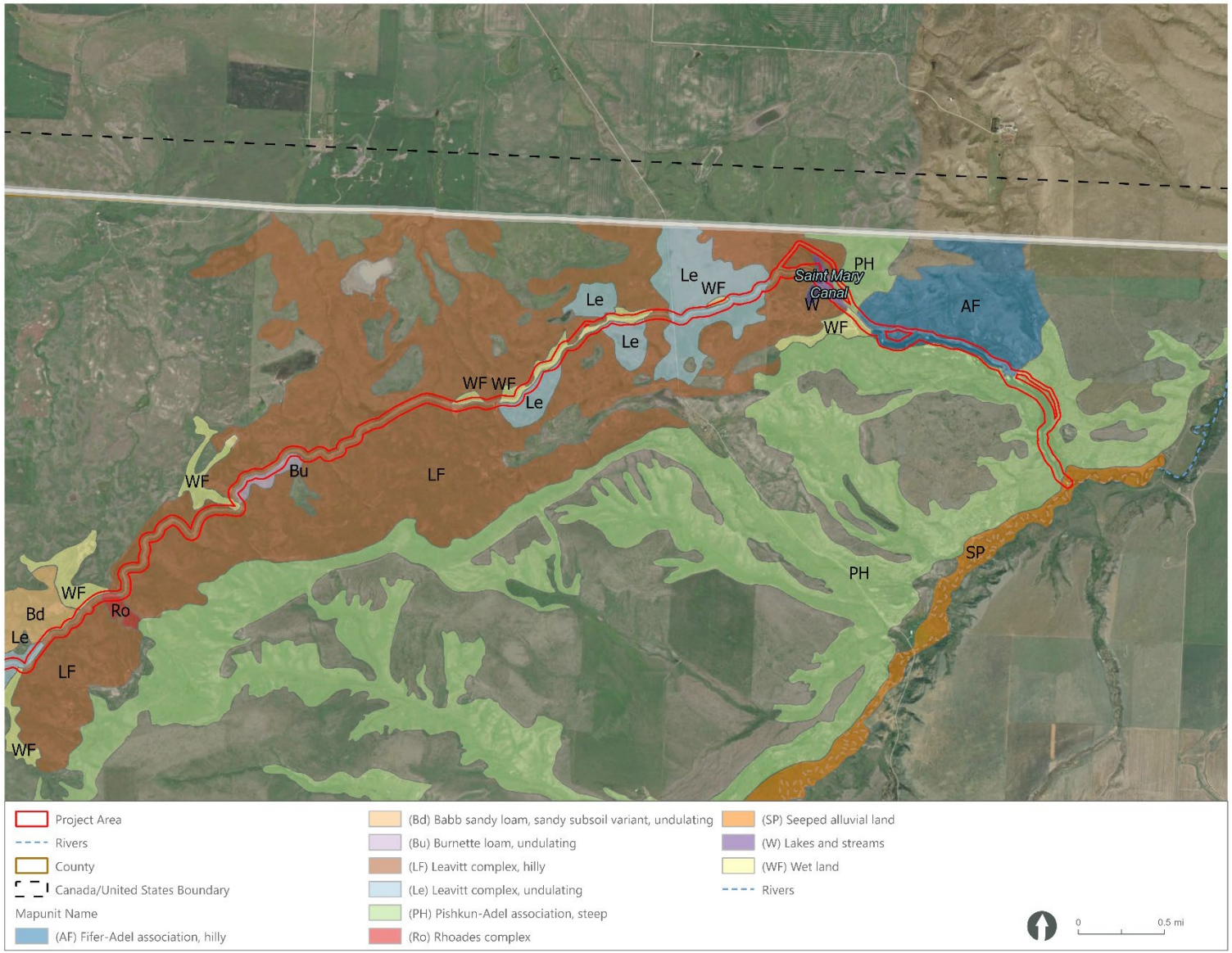

Figure 3-10. Soils in the Study Area (4 of 4)

3.2.2 Landslides

There are locations prone to landslides within the project area. Table 3-5 and Figure 3-1 depict the known landslide locations. Factors contributing to the instability within these areas include low soil shear strengths, elevated soil moisture contents, hydrostatic/artesian forces, surcharged loads, slope geometry, and toe erosion (TD&H 2008). Other factors contributing to the instability include poorly consolidated glacial sediment, over-steepened slopes and banks, and fluctuations in groundwater conditions due to canal operations and precipitation (Milk River Board of Control 2022).

Some landslide areas have not been active for years and are only being monitored visually; others remain active. Regardless of the status, the previously identified landslide locations are noted because any change to the canal could cause these areas to become unstable again. The following known landslide locations have impacted the canal:

- Dewolfe Ranch (Slide Area 1)
- DeWolfe Bridge (Slide Area 2)
- Mid-Section 22 (Slide Area 3)
- North Slope 700 (Slide Area 4)
- East Section 22 (Slide Area 5)
- Grizzly Slide (Slide Area 6)
- New Slide West of Big Cut (Slide Area 7)
- Big Cut (Slide Area 8)
- 4th of Jully (Slide Area 9)
- Gravel Road Bridge (Slide Area 10)
- Martin Slide (Slide Area 11)
- Pipeline Slide (Slide Area 12)
- New Slide (Slide Area 13)

3.3 Prime and Unique Farmlands

The study area for prime and unique farmland is the project area and the service area. NRCS has issued regulations in 7 CFR 658 requiring federal agencies to consider the effect their programs have on farmland preservation. Farmland subject to these requirements includes prime or unique farmland or farmland of statewide or local importance.

Approximately 3 acres of farmland of statewide importance exist within the project area (Figure 3-11). The service area has approximately 78,263 acres of farmland categorized as prime, unique, or of statewide importance (Figure 3-12). Some of the farmland categories are based on irrigation or drainage status, such as “farmland of statewide importance, if drained” or “prime farmland if irrigated.”

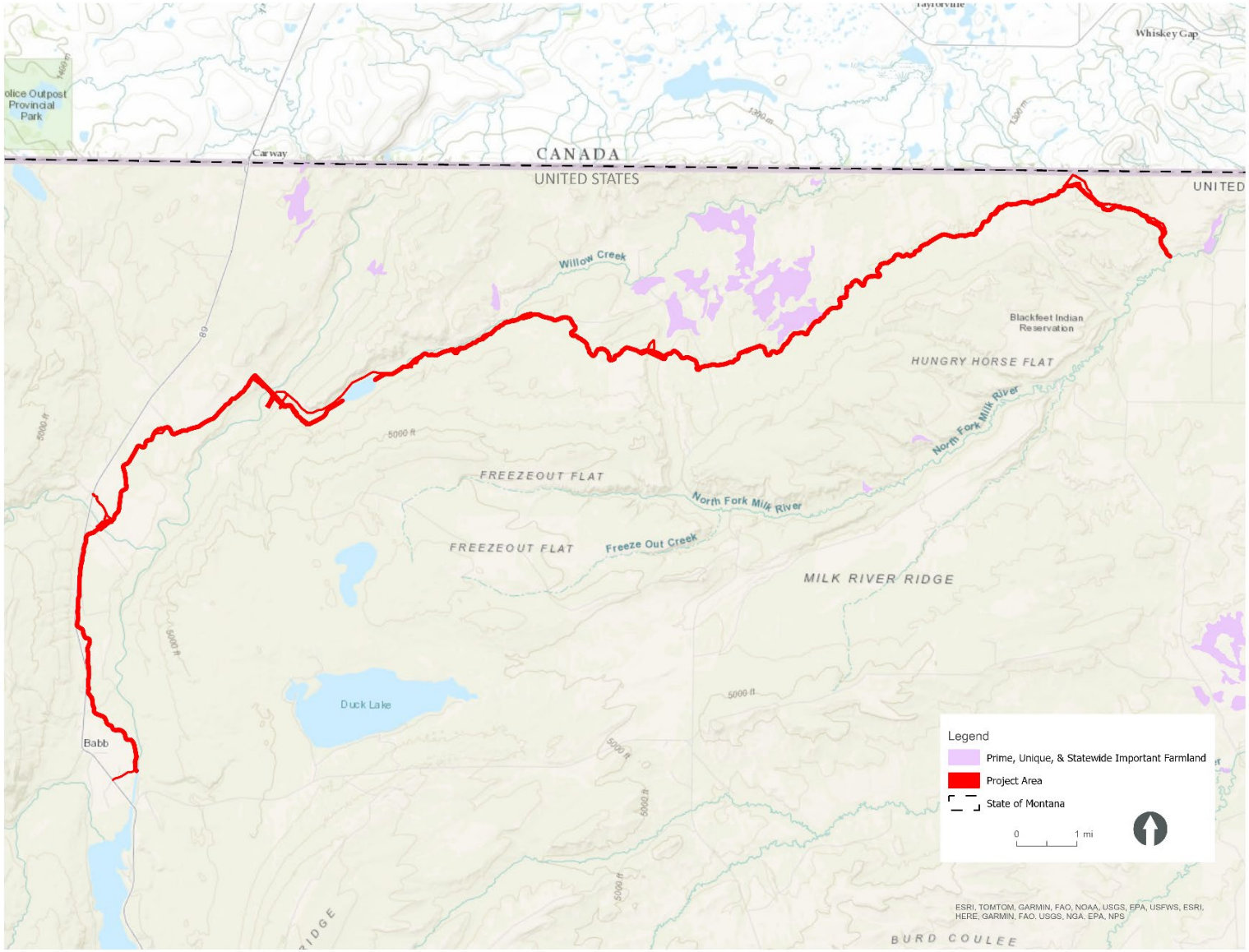

Figure 3-11. Farmland Classification Near the Project Area

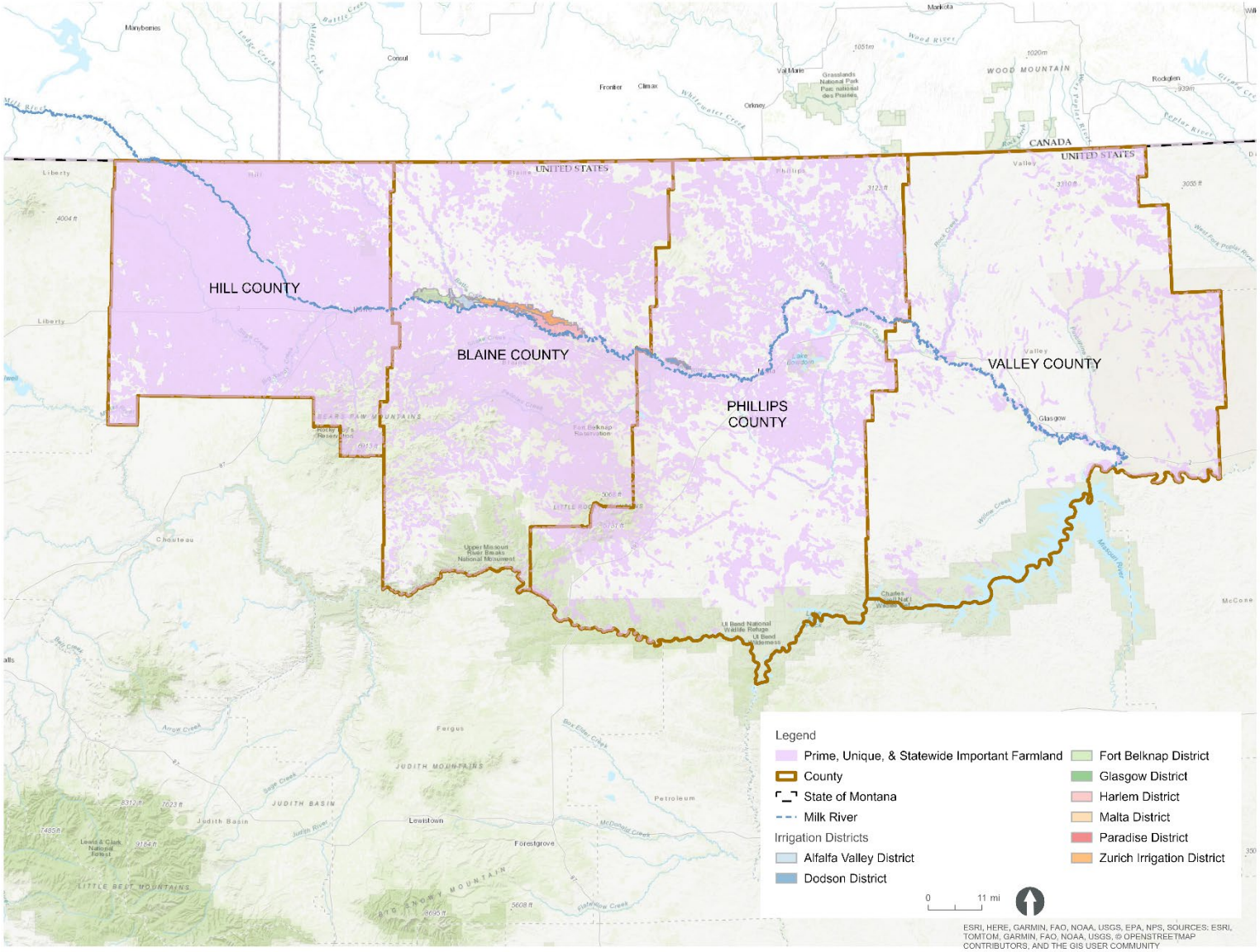

Figure 3-12. Farmland Classification for Service Area

3.4 Water Resources

Water resources include water rights, surface water (quality and quantity), groundwater, wetlands, and floodplains. The study area for water resources is the project area and an additional 0.5-mile buffer on either side of the St. Mary Canal System and, when appropriate, includes the waters associated with the Milk River Project. Figure 3-14 shows an overview of the surface water associated with the project area.

3.4.1 Water Rights and Water Supply

Montana water rights are guided by the prior appropriation doctrine (first in time is first in right). A priority date is generally established when the water was first put to beneficial use. When there is insufficient water to meet all the demands, senior water rights holders (i.e., drinking water, first rights) may operate to the exclusion of junior water rights holders. This makes priority dates particularly important in dry years. From a water rights perspective, the St. Mary and Milk River watersheds are unique because of the Boundary Waters Treaty with Canada, the transbasin diversion within the state of Montana, the existence of federal reserved water rights for three Indian Reservations, and the significant role of Milk River Project water rights. Montana water rights only apply to the U.S. share of internationally apportioned waters. This includes the St. Mary River, Milk River, and their tributaries. In general, federal reserved water rights (through compacts with the U.S.) have the earliest priority dates, followed by Reclamation's Milk River Project water rights, which encompass most of the land irrigated from the main stem of the Milk River. All other water rights are typically junior to these rights. During extreme drought, the only water in the Milk River downstream is the St. Mary River water diverted via the canal.

In Montana, beneficial use is defined as the use of water for the benefit of the appropriator, other persons, or the public, including but not limited to agricultural (stock water), domestic, fish and wildlife, industrial, mining, municipal, power, and recreational uses (MCA 85-2-102).

The following outlines the water rights for the Milk River Project:

- *Water Rights between U.S. and Canada:* The Boundary Water Treaty of 1909 is an agreement between the U.S. and Canada that divides the water supply of the St. Mary River and Milk River equally between the two countries (The Boundary Treaty 1909). The 1921 Order of the International Joint Commission (IJC) established the flows each country would be allotted (IJC 1921). Currently, Canada receives a larger appropriation of water from the St. Mary River than the U.S., and the U.S. receives a larger appropriation of water from the Milk River due to Canada's inability to store excess flows.
- *Water Rights Allocation under Montana Legislature:* Reclamation holds water rights for 850 cfs of water withdrawal from the St. Mary River to provide beneficial use by irrigation districts, individuals, and municipal use within the Milk River Basin in north-central Montana (Water Right 40T-40955-00; MT Water Court 2022).

As described in Chapter 1, the Milk River Project supplies water to irrigation districts, individual irrigators, and several communities along the Milk River (including Havre, Chinook, Harlem, and Hill County). Water is diverted from the St. Mary River through the canal on a seasonal basis, and the diversion is dictated by three main factors: water rights, water supply, and the Boundary Waters Treaty between the U.S. and Canada. Flows typically occur between April and September each year, peaking by June, and are stored within the Fresno and Nelson Reservoirs for irrigation use. The irrigation season start-up and end dates, as well as the volume of water diverted, can vary from year to year and are highly dependent on snowpack and precipitation levels in the surrounding mountainous areas. The St. Mary River provides 59 percent of the water available for diversion to the Milk River irrigators during a typical year (Figure 3-13); however, during dry years, the importance of the St. Mary Canal System water is greater because there is little natural Milk River flow available (Reclamation 2012).

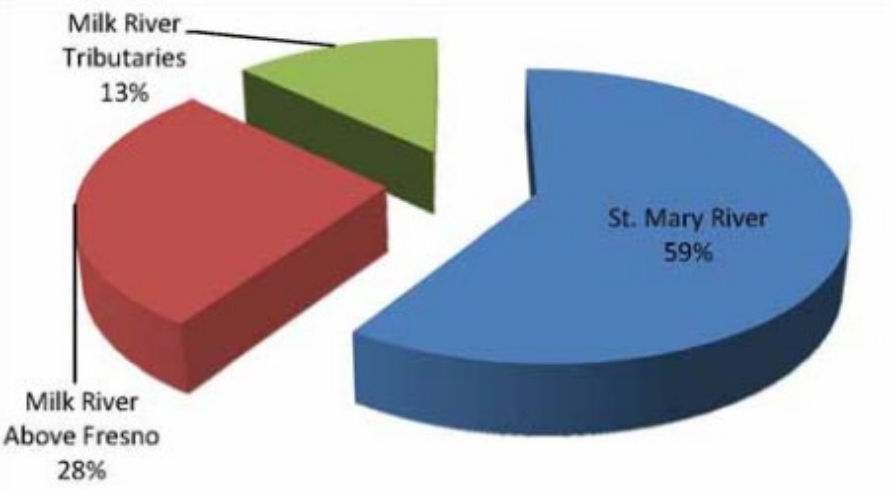

Figure 3-13. Milk River Irrigation Season Median Water Supply Available for Direct Diversion (April 1–October 1) (Reclamation 2012).

The determined safe capacity of diversion through the canal as of 2006 was approximately 650 cfs. At this capacity, the theoretical average annual diversion is 208,402 AF. Based on a 25-year period (1979-1980 through 2003-2004), the average annual natural flow of the St. Mary River at the U.S. and Canada Border was approximately 610,300 AF, of which the U.S. apportionment averaged nearly 246,500 AF. However, the same report found that, based on flow measurements over the same 25-year period, the U.S. was only diverting an average of 175,400 AF, or 71 percent of its apportionment (TD&H 2006).

Between 1979 and 2004, the average natural flow of the St. Mary River at the international boundary was 610,315 AF. This average natural flow volume was derived from a 25-year dataset (November 1, 1979–October 31, 2004) compiled by Alberta Environment and the Montana DNRC. The data was based on daily flow records from USGS Station 05020500 and Reclamation Hydromet data for Sherburne Reservoir (TD&H 2006).

Under the Boundary Waters Treaty, Canada is entitled to a prior appropriation of 500 cfs or three-fourths of the river's natural flow, whichever is less. Using the IJC accounting procedures, the maximum U.S. entitlement was calculated to be 246,447 AF. However, the actual average U.S. diversion during this period was 175,339 AF, measured at USGS Station 05018500 (St. Mary River Siphon inlet). This represents approximately 71 percent of the U.S. entitlement (TD&H 2006). Because this was at the St. Mary Siphon, seepage loss for the 9 miles was added in to the amount measured at this location to estimate the total quantity diverted into the canal.

3.4.2 Surface Waters and Water Quality

This section provides a simple overview of the major surface waters within the Milk River Project and then focuses on surface waters crossed by the project area.

Major Surface Waters of the Milk River Project

The major surface waters within the Milk River Project include the Sherburne Reservoir, St. Mary River, North Fork Milk River, Milk River, Fresno Reservoir, and Nelson Reservoir. The water that is diverted begins at the Sherburne Reservoir then flows down the St. Mary River. A portion is then diverted into the St. Mary Canal System. The St. Mary River continues to flow north into Canada. The water diverted into the St. Mary Canal System flows into the North Fork Milk River, which crosses into Canada. The water flows into the Milk River within Canada, then crosses back into Montana to then flow into the Fresno Reservoir, and then onward to Nelson Reservoir. The Fresno Reservoir provides water supply to Nelson Reservoir.

Under Section 106 of the Clean Water Act (CWA), the Blackfeet Tribe conducts water quality monitoring of the water resources within the Blackfeet Reservation. The beneficial uses assigned to the St. Mary River include migration habitat for aquatic organisms and spawning and breeding habitat for fish and wildlife. The Tribe monitors the St. Mary River at two locations: downstream of the U.S. Highway 89 bridge and the St. Mary Diversion Dam. The water quality conditions in the St. Mary River currently meet all designated water quality standards (Reclamation 2023).

The Montana Department of Environmental Quality (DEQ) monitors the water resources within Montana, except for the Tribal Reservations. The surface water classification of the Milk River is designated as B-3, which is defined as waters that are to be maintained suitable for drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming, and recreation; growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply. According to the 2020 water quality assessment, the upper reach of the Milk River at the international boundary is considered impaired for aquatic life. The causes of impairment are copper, iron, lead, and flow alteration. The source of the metals is unknown and most likely attributed to natural conditions associated with geology. The local geology is part of the Judith Formation with lignite beds and sandstone/siltstone. The primary sediment sources in the U.S. portion of the watershed are from natural runoff of the surrounding landscape (Reclamation 2023).

The Milk River downstream of the Canada border to its confluence with the Missouri River and Fresno Reservoir is listed on the state 303(d) list as an impaired waterbody. Impairments along the Milk River within this area vary but include copper, high flow regime, iron, lead, other flow regime alterations, physical substrate habitat alterations, and mercury (Montana DEQ 2016). Water quality in the Milk River watershed varies considerably, mostly because of differences in geology, erosion rate, land uses, and quality of groundwater inflow. Physical substrate habitat alterations and flow regime modifications have been noted as concerns for aquatic life in Fresno Reservoir (Montana DEQ 2021). The Fresno Reservoir has lost about 29 percent of its storage capacity to sedimentation. Reclamation is completing a feasibility study to evaluate the increase of storage within Fresno Reservoir (Reclamation 2024).

Surface Waters Associated with the Study Area

Surface waters associated with the study area include named and unnamed waterbodies, which are displayed in Table 3-5. For all surface waters that could enter the canal, underdrains convey the runoff and flow under the St. Mary Canal System to prevent additional water from entering. Siphons are in place to convey either the canal water or other large surface waters under the St. Mary Canal System. The underdrains and siphons are located at the major surface water crossings and are listed from downstream to upstream in Table 3-5. In addition to these surface waters, smaller drainages runoff toward the St. Mary Canal System.

Within the project area, water quality standards are promulgated by the Blackfeet Tribe under their tribal authority (Blackfeet Environmental Office Ordinance No. 117, Aquatic Lands Protection Ordinance 2019). The beneficial uses associated with the St. Mary Canal System operations within the Reservation include (Blackfeet Nation 2023b):

- Domestic Water
- Class 1 – Cold Water Fishery
- Recreation Class 1 – Full Body Contact
- Wildlife Growth and Propagation
- Agriculture
- Navigation and Industrial Uses
- Cultural and Spiritual

The St. Mary Canal System is not monitored for water quality parameters.

Table 3-5. Surface Waters Crossings of the Project Area

Name	Project Nexus
St. Mary River Diversion	The St. Mary River is diverted into the canal.
Kennedy Creek Siphon	St. Mary Canal System runs below Kennedy Creek through the Kennedy Siphon approximately 3.7 miles north of Babb, MT.
Powell Creek	Crosses the St. Mary Canal System between the Kennedy Creek Siphon and St. Mary Siphon.

Name	Project Nexus
St. Mary Siphon	Conveys the St. Mary Canal System over the St. Mary River crossing.
Spider Lake	The St. Mary Canal System flows into Spider Lake from the west. Flows continue east out of Spider Lake and back into the St. Mary Canal System.
Willow Creek	Portions of this creek and its associated wetlands are located within the project area northeast of Spider Lake. Creek is fed by seepage from the canal and an associated drainage crosses through an underdrain.
Halls Coulee Siphon	Conveys the St. Mary Canal System over an unnamed tributary to Willow Creek.
Cow Creek	A smaller surface water drainage that extends from Willow Creek. Crosses the canal and is conveyed with an underdrain.
Five Unnamed Waterbodies	These drainages are conveyed under the canal through underdrains.
North Fork Milk River	River receives St. Mary Canal System flows approximately 29 miles northeast of St. Mary Diversion Dam. North Fork Milk River feeds into the Milk River, which flows into Canada and eventually back into the U.S.

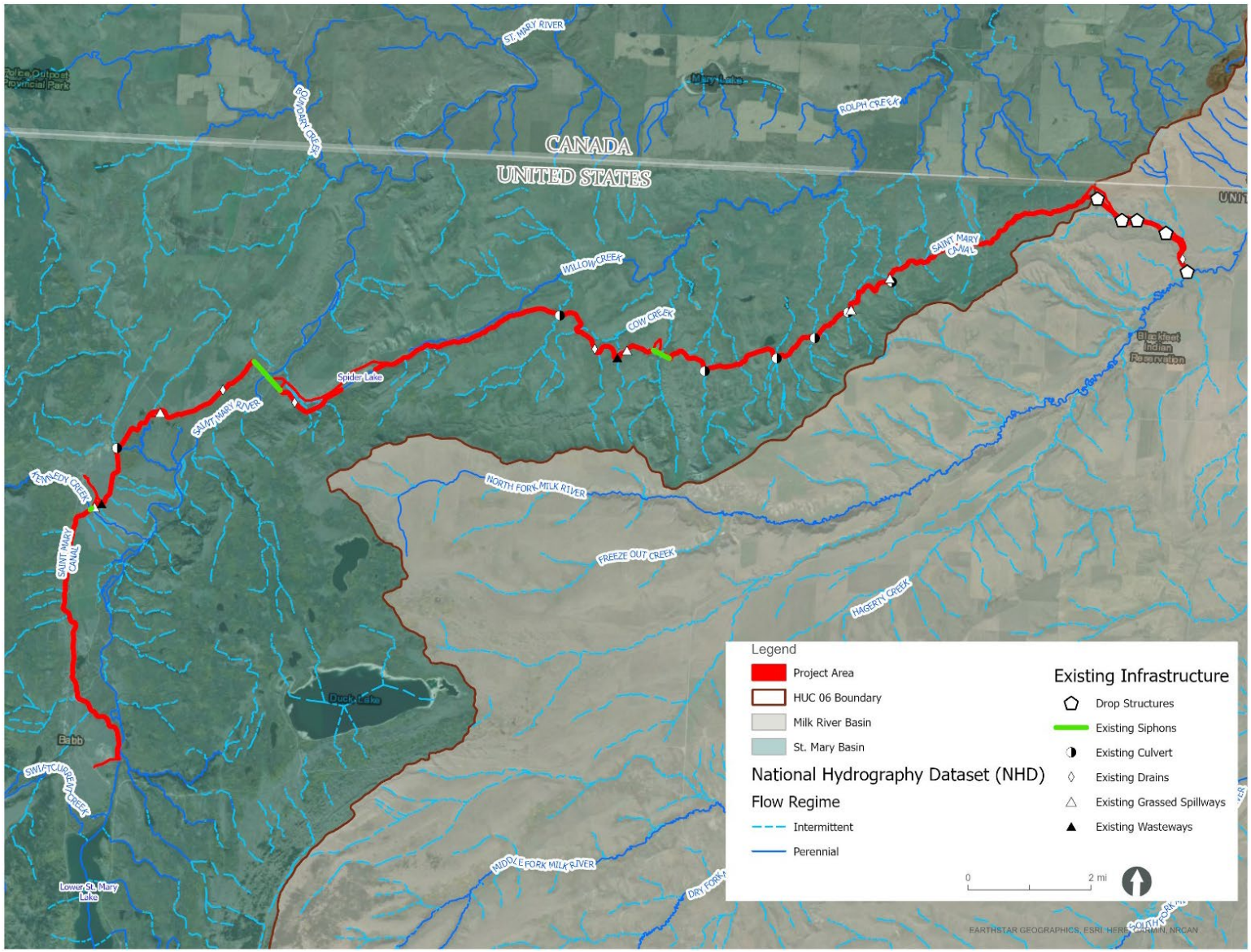

Figure 3-14. Overview of Surface Waters Along the Project Area

3.4.3 Wetlands and Waters of the U.S.

Wetlands within the U.S. are protected under the CWA and EO 11990. The CWA establishes the framework for regulating discharges of pollutants into the Waters of the U.S. (WOTUS) and regulating quality standards for surface waters. Wetlands are defined under the CWA as, “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

The USACE Montana Regulatory Office administers CWA Section 404, which requires a permit for the discharge of dredged or fill material into WOTUS, including wetlands. NRCS is the lead federal agency and, therefore, must carry out EO 11990, which requires federal agencies to avoid and minimize impacts to the extent practicable and mitigate unavoidable impacts on all natural wetlands.

Wetlands within the project area may be subject to regulation under the federal CWA, which includes Section 401 of the CWA administered by the Blackfeet Environmental Office, as well as Blackfeet Nation Ordinance 117, the Blackfeet Aquatic Lands Protection Ordinance (Blackfeet Environmental Office 2019). The Blackfeet Environmental Office Water Quality Program is responsible for administering Blackfeet Aquatic Lands Protection Ordinance regulations and permits.

Based on information from the Montana Natural Heritage Program’s (MTNHP) Wetland and Riparian Mapping Center and National Wetland Inventory (NWI) data provided by the U.S. Fish and Wildlife Service (USFWS), wetlands exist throughout the project area. Field reconnaissance was completed in September of 2023. Field reconnaissance was coordinated with and attended by the Blackfeet Tribe Wetland Manager. Results from this field reconnaissance, including detailed descriptions of wetland areas, can be found in Appendix D1. The NWI dataset was used to determine wetland presence for areas beyond the area evaluated as part of field reconnaissance. Table 3-6 summarizes the wetland area and wetland density along various segments of the St. Mary Canal System, both within the project area and within 0.5 mile from the St. Mary Canal System. Figure 3-15 displays an overview of the wetlands and identifies the project segments as summarized in Table 3-6. Refer to Appendix D1 for further information from the field reconnaissance. The following is a general characterization of wetland resources along each segment.

- *Diversion Dam to Kennedy Creek:* Wetlands are sedge-dominated (*Carex* spp.), permanent emergent wetlands (see Photo 2).
- *Kennedy Creek to St. Mary Siphon*: Small emergent wetlands fringing open waters were present. Several depressional potholes are in the vicinity.
- *St. Mary Siphon*: No wetlands were observed along the siphon or the banks of the St. Mary River (see Photo 3). The St. Mary River flows through this segment of the project.
- *St. Mary Siphon to Drop Structure 1*: Wetlands with a scrub-shrub component were observed. Dominant scrub-shrub species include Rocky Mountain maple (*Acer glabrum*), thinleaf alder (*Alnus incana*), river birch (*Betula occidentalis*), red-osier dogwood (*Cornus sericea*), hawthorn (*Crataegus spp.*), chokecherry (*Prunus virginiana*), skunkbush sumac (*Rhus trilobata*), Drummond's willow (*Salix drummondiana*), sandbar willow (*Salix exigua*), Pacific willow (*Salix lucida*), rose (*Rosa species*), silver buffaloberry, and snowberry. Permanent emergent wetlands were present where water ponds near the inlet and outlet of the canal into Spider Lake.

Photo 2. Sedge Dominated Wetland Directly Downstream of the Diversion Dam

Photo 3. St. Mary River Siphon Crossing

- *Drop Structure 1 to Drop Structure 5*: The five Drop Structures create pools and backwater features that are conducive to forming wetlands. At Drop Structure 1, a large pool exists that has adjacent wetland habitat.

Table 3-6. Preliminary Identification of Aquatic Resources

Segment	Wetland and WOTUS within Project Area (Acres)	Wetland and WOTUS Density within Project Area (Acre/Mile)	Wetland and WOTUS within 0.5 Mile from Canal (Acres)	Wetland and WOTUS Density within 0.5 Mile from Canal (Acre/Mile)
Diversion Dam to Kennedy Creek	3.61	0.76	212.56	44.75
Kennedy Creek to St. Mary Siphon	5.14	1.21	250.08	58.84
St. Mary Siphon	1.12	2.23	66.56	133.11
St. Mary Siphon to Drop Structure 1	99.90	6.09	580.33	35.39
Drop Structure 1 to Drop Structure 5	7.01	3.18	77.78	35.35
Total	116.77	--	1,187.30	--

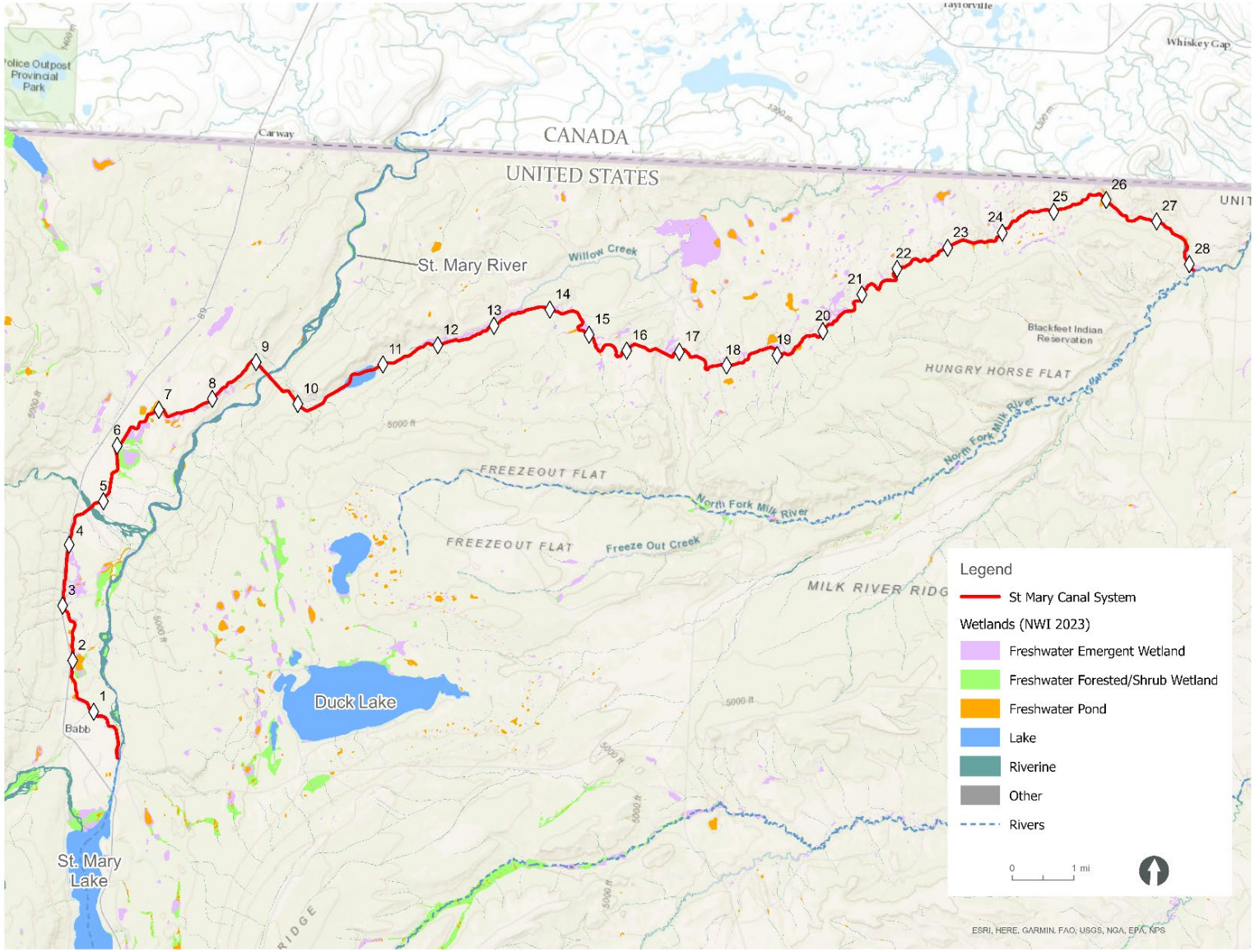

Figure 3-15. Wetlands within Project Area Vicinity

3.4.4 Groundwater

The study area for groundwater was defined as a 0.5-mile buffer on both sides of the St. Mary Canal System. The general hydrogeologic setting within the analysis area for water resources is fine-grained, low-permeability bedrock aquifers overlain in many areas by relatively thin, unconsolidated-deposit aquifers of moderate to high permeability. Groundwater from both types of aquifers is used mainly for minor stock watering and domestic supply purposes (Canon 1996).

Bedrock Aquifers

The entire canal lies within a structurally complex area known as the disturbed belt (Mudge and Earhart 1980). This is a zone of closely spaced, westward dipping thrust faults, with many folds and some normal faults. All bedrock units exposed in this area are sedimentary in origin and range in age from late Cretaceous to early Tertiary. Table 3-7 describes the bedrock formations traversed by the canal from west to east. In addition, a hydrogeology memo was completed (see Appendix D2).

Water seeping from the canal will mostly be entrained in unconsolidated deposit aquifers because they are much more permeable than the underlying bedrock aquifers. The water flows in the unconsolidated deposit aquifers for relatively short distances before it discharges to the surface through springs and creeks. A small amount of the seepage water may infiltrate through the sediments of the unconsolidated deposit aquifers to fill fractures in the underlying bedrock aquifers, but bedrock aquifers transmit only small quantities of water over very short distances. Water that flows along the top of bedrock aquifers is essentially entrained in the unconsolidated deposit aquifers, and as stated previously, these aquifers transmit water over relatively short distances before it discharges to the surface. The key point is that seepage water will not travel far from the canal before it discharges to the surface.

Table 3-7. Bedrock Formations Traversed by the Canal from West to East

Formation	Canal Mile	Description	Water-Bearing Characteristics
Two Medicine	0–10	Mudstone with some sandstone.	Mudstone in the Upper portion of the formation produces little to no water.
St. Mary River	10–20	Mostly mudstone interbedded with thin beds of fine-grained sandstone.	In general, the formation yields little water to stock or domestic wells.
Willow Creek	20–28	Variegated clay and soft sandstone with local lenses of purple-gray limestone.	Formation is not considered to be an aquifer although a few wells yield from 1 to 10 gpm. Overall, not suitable for stock or domestic water supplies.

Unconsolidated Deposit Aquifers

The bedrock units described above are overlain by unconsolidated deposits of Quaternary age, or in some areas, by gravel of late-Tertiary age. These deposits comprise the most important aquifers in many areas. Unconsolidated deposits include gravel in terraces and pediments, till

from continental ice sheets and mountain glaciers, sediments deposited in glacial lakes, rock and surficial debris in landslides, and alluvium in the channels and flood plains of many streams (Canon 1996). Each of these formations is described in Table 3-8.

Table 3-8. Unconsolidated Deposit Aquifers Traversed by the Canal from West to East

Deposit	Canal Mile	Description	Water-Bearing Characteristics
Alluvium	0–6	Alluvium. Unconsolidated gravel, sand, silt, and clay beneath floodplains of major streams and some outwash gravel from piedmont glaciers. Present around almost all stream channels on the reservation.	Thick alluvial deposits are a dependable source of water for domestic and stock wells, yielding 10 to 50 gpm. In the St. Mary area, thick alluvial deposits yield 100 gpm or more to some wells.
Till Deposited by Piedmont Glaciers	6–12	Gravelly to clayey till in moraines and gravel deposits in narrow buried channels and meltwater channels. Thickness typically from 1 to 15 feet. Till deposited by Piedmont glaciers covers much of the western and southern parts of the reservation.	Generally, a poor aquifer due to its low permeability. However, in some areas, gravel deposits between till units or underlying till are an important aquifer.
Till Deposited by Continental Ice Sheets	13–28	Pebbly clay loam or loam till containing numerous granitic and metamorphic pebbles, cobbles, and boulders.	Clayey to loamy till has low permeability and yields little to no water to wells.

Alluvium gravel beds within or beneath till, gravel in pediments and terraces, and glacial outwash are all used as sources for stock and domestic water supplies. Where bedrock is unproductive mudstone or shale, unconsolidated deposits are the only source of potable groundwater. Recharge is greatest to unconsolidated deposit aquifers in the western portion of the canal where precipitation is greatest. Gravel-capped pediments and terraces are readily recharged by percolation of rainfall and snowmelt (Canon 1996).

Discharge from unconsolidated deposit aquifers is to springs, streams, lakes, wells, and underlying bedrock aquifers. Springs are numerous along contacts between unconsolidated deposits and underlying bedrock. These contact-type springs demonstrate the greater permeability and ground-water circulation in unconsolidated deposit aquifers. The discharge of water at these features indicates that groundwater flow paths are probably relatively short. This likely prevents the aquifers from conveying water to wells that are not near the canal. The most productive unconsolidated deposit aquifers in the vicinity of the project area with the potential to sustain high-capacity wells are present near the town of St. Mary (Canon 1996).

Well Inventory and Lithologic Analysis

An inventory of the wells provided by the Montana Bureau of Mines and Geology Ground Water Information Center (GWIC) online web mapping application shows 17 wells and 12 boreholes located within approximately 2 miles of the St. Mary Canal System (Figure 3-16). Most of the 17 wells provide stock watering or domestic water supply. The average depth of the wells, not including the boreholes, is 119 feet. Of the 17 wells, 11 penetrate unconsolidated material, such as clay, silt, sand, gravel, and boulders, and do not extend into bedrock. This supports the aquifer characterizations discussed above that most groundwater is derived from shallow unconsolidated deposit aquifers because the water-bearing characteristics of bedrock aquifers are generally poor (see Appendix D2).

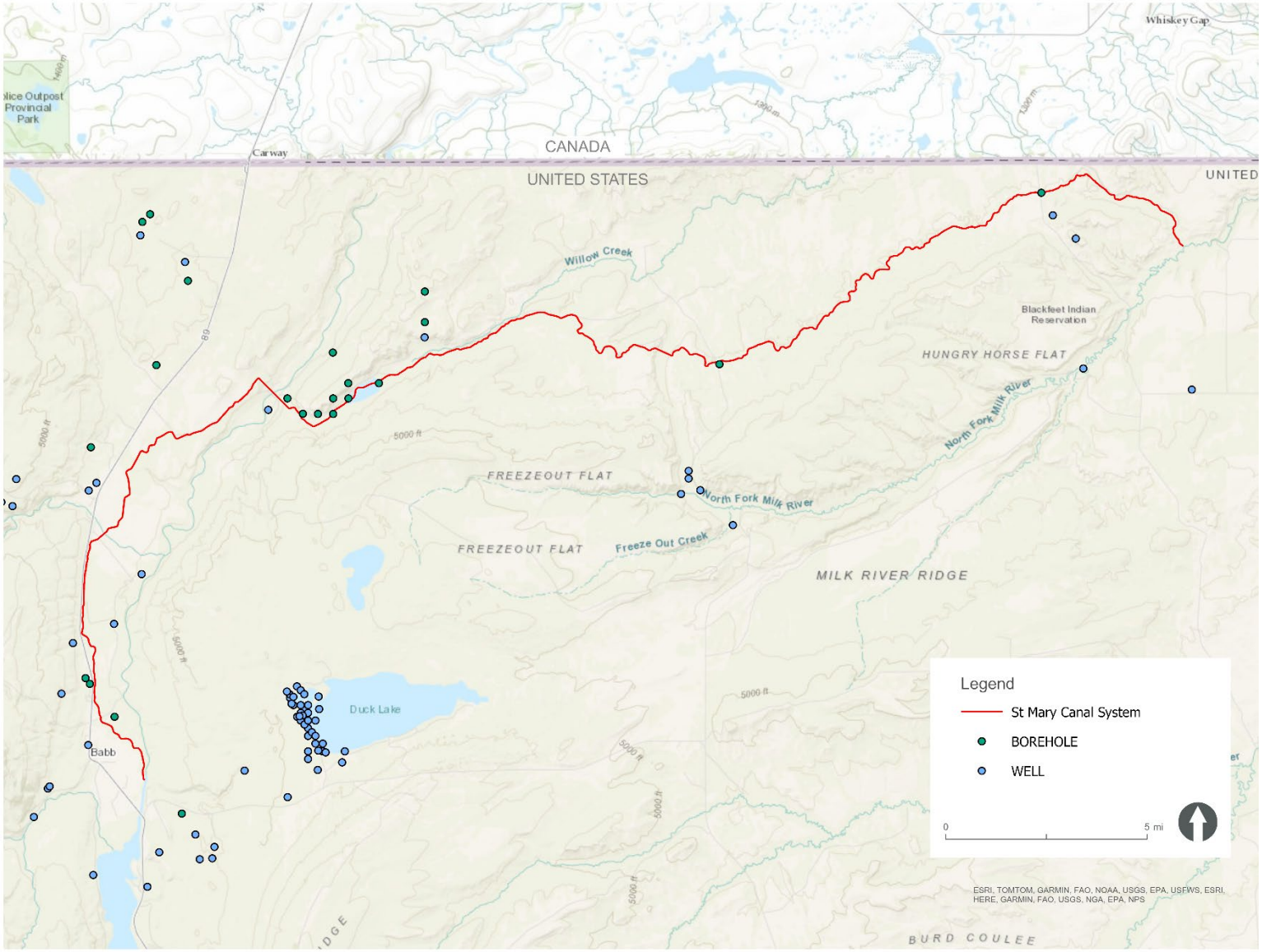

Figure 3-16. Wells and Boreholes within Five Miles of the Project Area

3.4.5 Floodplains

The study area for floodplains review is the project area. The project area falls within the Blackfeet Reservation. A local floodplain administrator would be designated by the Tribe to administer a floodplain permitting program for construction within areas designated as 100-year floodplains by the Federal Emergency Management Agency (FEMA). FEMA defines the regulatory floodway as the channel of a river or other watercourse and adjacent land areas and is reserved to discharge base flood flows without increasing the water surface elevation more than a designated height. Floodplains are land areas susceptible to being inundated by floodwaters.

The project area is in an unincorporated area of Glacier County, Montana (Flood Insurance Rate Map [FIRM] panels 300151 0006 B and Unmapped_30x017), where floodplains are not mapped and, therefore, not subject to floodplain permitting requirements. Although there are no mapped floodplains within the project area, there are natural floodplains associated with the St. Mary River and its associated underdrains and siphons.

NRCS soil survey information suggests that approximately 18 percent of the soils in the project area are within potential floodplains based on the proportion of the project area with soils that have formed within alluvial deposits. Notably, 16.2 percent of the project area consists of the soil map unit “Wet land,” which is prevalent along linear drainage areas conveyed along and under the canal. The most significant “Wet land” extends parallel to the canal for approximately 2 miles along Willow Creek beginning 3 miles downstream of where the St. Mary Siphon spans the St. Mary River.

3.5 Terrestrial and Aquatic Species

The study area for general habitat, vegetation, and terrestrial species was broadened to be an approximately 0.5-mile buffer on either side of the St. Mary Canal System to be able to characterize the more general area. This area was chosen to include the waterways of the St. Mary and Milk Rivers, which encompass any potential direct impacts from construction that occur, as well as indirect impacts on aquatic and terrestrial species that rely on the subwatersheds. The area considered for threatened and endangered species is discussed further in Section 3.5.5.

3.5.1 General Habitat and Vegetation

General habitat and vegetation are summarized using MTNHP Land Cover mapping information. The MTNHP Land Cover data was released in 2023 and was revised using ecogroups specific to Montana (Montana State Library 2025). The study area data is provided in Table 3-9.

Table 3-9. General Land Cover in the Study Area (MTNHP 2023a)

Land Cover Type	Ecological System	Approximate Acreage	Percent of Total (%)
Rocky Mountain Lower Montane, Foothill, and Valley Grassland	Grassland Systems	6,723	40
Pasture/Hay	Human Land Use	2,074	13
Great Plains Riparian	Open Water/ Wetlands and Riparian Systems	1,585	10
Great Plains Mixed Grass Prairie	Grassland Systems	1,057	7
Aspen and Mixed Conifer Forest	Forest and Woodland Systems	753	5
Alpine-Montane Wet Meadow	Open Water/Wetlands and Riparian Systems	679	4
Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland	Open Water/Wetlands and Riparian Systems	677	4
Rocky Mountain Subalpine- Upper Montaine Grassland	Grassland Systems	597	4
Open Water	Open Water/ Wetlands and Riparian Systems	577	4
Cultivated Crops	Human Land Use	574	4
Other Road	Human Land Use	416	3
--	Total	15,712	100

Note: Land Cover Types below 2% were not included in analysis.
Source = MTNHP 2023a

The predominant land cover is Rocky Mountain Lower Montane, Foothill, and Valley Grassland, which represents approximately 40 percent of the study area. According to MTNHP, this system is typified by cool-season perennial bunch grasses and forbs (greater than 25 percent) cover, with a sparse shrub cover (less than 10 percent) (MTNHP 2023b). Common grass species include rough fescue (*Festuca campestris*), Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and western wheatgrass (*Pascopyrum smithii*) (MTNHP 2023b).

The next two most common land cover types include Pasture/Hay and Great Plains Riparian. Pasture/hay is agricultural land that typically has herbaceous cover used for livestock grazing or hay production. Pasture/hay in the project vicinity is typically non-irrigated. The study area includes numerous waterways and waterbodies that support fringing zones of riparian vegetation. Dominant shrubs within the riparian zones may include Rocky Mountain maple (*Acer glabrum*), thinleaf alder (*Alnus incana*), river birch (*Betula occidentalis*), red-osier dogwood (*Cornus sericea*), hawthorn (*Crataegus spp.*), chokecherry (*Prunus virginiana*), skunkbush sumac (*Rhus trilobata*), Drummond's willow (*Salix drummondiana*), sandbar willow (*Salix exigua*), Pacific willow (*Salix lucida*), rose (*Rosa species*), silver buffaloberry, or snowberry (MTNHP 2023b). Riparian buffers, such as those found along the St. Mary Canal System, provide ecosystem services similar to wetlands. The St. Mary River provides riparian habitat both upstream and downstream of the St. Mary Diversion Dam. These areas of riparian habitat include locations within Glacier National Park and Woolford Provincial Park (located in Canada).

As shown in Table 3-2, approximately 7 percent (79.6 acres) of the project area consists of forested areas. Forested areas along the St. Mary Canal System, especially toward the southwestern end of the project, fall largely into the Northern Rocky Mountain Lower Montane Riparian Woodland Category (MTSL 2023). Tree species typical of this ecoregion include the black cottonwood (*Populus balsamifera ssp. trichocarpa*) as well as the riparian species noted above (Montana Field Guides 2025).

The St. Mary Canal System is located within the Crown of the Continent Ecosystem, which stretches from British Columbia and Alberta, Canada, south through southwestern Montana, United States (Figure 3-17). This area includes the greater Glacier National Park ecosystem and its surrounding landscapes and provides key connectivity and travel corridors for wildlife. The study area intersects the Crown of the Continent Ecosystem just east of the Rocky Mountains. The study area is located within a fragmented portion of this ecosystem with Highway 89 and the existing St. Mary Canal System already in place. The forested areas present along the St. Mary Canal System likely serve as wildlife corridors for species/individuals traveling east-west across Highway 89, including both small and large mammals. Species that may inhabit the area are detailed below in Section 3.5.2. The trees present within the study area also provide habitat for resident and migratory birds.

Figure 3-17. Crown of the Continent Ecosystem (Crown Managers Partnership)

Per the MTNHP Environmental Summary report, one vascular plant species of concern (SOC), the autumn willow (*Salix serissima*), has potential to occur in the vicinity of the study area (MTNHP 2025). This species is typically found in wetland and riparian areas.

Noxious Weeds and Invasive Vegetation Species

State-recognized noxious weeds and invasive species that may be present within the study area are listed in Table 3-10 (MTNHP 2025). Two state-recognized noxious weeds were identified during field reconnaissance conducted in September 2023: Canada thistle and spotted knapweed. Spotted knapweed was noted to be very prevalent along the operation and maintenance (O&M) roadway between the main diversion and the St. Mary Siphon (NRCS 2023). Within the study area, one invasive aquatic species may be present, the American waterlily (*Nymphaea odorata*).

Table 3-10. Noxious Weeds and Invasive Vegetative Species that may be present within Study Area

Common Name	*Scientific Name*
Yellow Starthistle	*Centaurea solstitialis*
European Common Reed	*Phragmites australis ssp. australis*
Medusahead	*Taeniatherum caput-medusae*
Dyer's Woad	*Isatis tinctoria*
Rush Skeletonweed	*Chondrilla juncea*
Purple Loosestrife	*Lythrum salicaria*
Japanese Knotweed	*Polygonum cuspidatum*
Common Buckthorn	*Rhamnus cathartica*
Tansy Ragwort	*Senecio jacobaea*
Tall Buttercup	*Ranunculus acris*
Tall Hawkweed	*Hieracium piloselloides*
Kingdevil Hawkweed	*Hieracium praealtum*
Orange Hawkweed	*Hieracium aurantiacum*
Meadow Hawkweed	*Hieracium caespitosum*
Ventenata	*Ventenata dubia*
Perennial Pepperweed	*Lepidium latifolium*
Whitetop	*Lepidium draba*
Yellow Toadflax	*Linaria vulgaris*
Spotted Knapweed	*Centaurea stoebe*
Oxeye Daisy	*Leucanthemum vulgare*
Common Hound's-tongue	*Cynoglossum officinale*
Canada Thistle	*Cirsium arvense*

Common Name	*Scientific Name*
Dalmatian Toadflax	*Linaria dalmatica*
Hoary False-alyssum	*Berteroa incana*
Sulphur Cinquefoil	*Potentilla recta*
Common St. John's-wort	*Hypericum perforatum*
Common Tansy	*Tanacetum vulgare*
Leafy Spurge	*Euphorbia virgata*
Russian Knapweed	*Acroptilon repens*
Diffuse Knapweed	*Centaurea diffusa*
Field Bindweed	*Convolvulus arvensis*
Cheatgrass	*Bromus tectorum*
Russian Olive	*Elaeagnus angustifolia*

Canada Thistle

Canada thistle is native to Europe, as well as parts of Northern Africa and Asia. This species prefers sunny and warm areas with 15 to 30 or more inches of precipitation/irrigation per year but can grow in dryer cropland and pasture sites with less precipitation. Infestations of this species typically begin on disturbed ground, and plants can colonize 10 to 12 feet per year. Seeds from the seedhead of this species typically seed within 1 year; however, they can remain viable in the seedbank for up to 20 years if they are buried deeper than 8 inches below the soil's surface (NRCS 2006a). Management of this species is complicated by the extensive root system present. Long-term management and removal of the species typically requires persistent control over several years.

Spotted Knapweed

Spotted knapweed is native to portions of Europe and has been recorded in every county of Montana. This species spreads largely through seeds but can also spread by whole plants being transported in soil and on the root balls of other plants and trees. Seeds can remain viable and dormant in the soil for 8 or more years. Flower heads attached to the undercarriages of vehicles and equipment, seeds in mud attached to equipment, and seeds dropped into shoes of hikers pose threats for long distance transportation of the invasive species. Seeds can also be spread in the currents of rivers and streams. Spotted knapweed can spread as much as a few meters per year (NRCS 2006b). Long-term management of this species often requires persistent control methods over several years.

Weed control within the project area is accomplished through an agreement with Glacier County and in accordance with the Integrated Pest Management Plan (IPMP) and Montana noxious weed laws. A list of noxious weed laws can be found in the Montana Noxious Weed Management Plan (MTDA 2017). Annual maintenance of the St. Mary Canal System within the project area involves woody vegetation removal from around the structures and dam and weed control via chemical means (Reclamation 2020). Glacier County applies herbicides to control

weeds in accordance with the IPMP, as required by Reclamation policy (Reclamation 2020). Approval of the IPMP requires the use of EPA-registered pesticides in accordance with product labeling.

3.5.2 Terrestrial Species

The study area is situated just east of Glacier National Park, which provides important year-round grassland and forested habitat for many wildlife species, including grizzly bear (*Ursus arctos horribilis*), black bear (*Ursus americanus*), moose (*Alces alces*), elk (*Cervus canadensis*), and white-tailed deer (*Odocoileus virginianus*). The study area extends from the forested foothills eastward into grassland/shrubland habitat. Wildlife periodically use the St. Mary Canal System as a water source during the irrigation season and as a dispersal corridor. Vegetation present along the project area includes scattered forested habitat (primarily west of Spider Lake) and ample grassland and shrubland. According to MTNHP, there are four terrestrial SOC that have documented occurrences within the study area (MTNHP 2025). These species include the grizzly bear (*Ursus* arctos), the North American wolverine (*Gulo gulo*), the fisher (*Pekania pennanti*), and the Gillette's checkerspot (*Euphydryas gillettii*).

A wide variety of terrestrial species may be found within the study area, including many different species of mammals, reptiles, amphibians, and invertebrates. Additional mammals typical to the area may include pronghorn (*Antilocapra americana*), gray wolf (*Canis lupus*), coyote (*Canis latrans*), mountain lion (*puma concolor*), red fox (*Vulpes vulpes*), badger (*Meles meles*), bobcat (*Lynx rufus*), American marten (*Martes americana*), fisher (*Pekania pennanti*), Canada lynx (*Lynx canadensis*), several weasel species, snowshoe hare (*Lepus americanus*), white-tailed jackrabbit (*Lepus townsendii*), mountain cottontail (*Sylvilagus nuttallii*), yellow-bellied marmot (*Marmota flaviventris*), striped skunk (*Mephitis mephitis*), multiple species of ground squirrels, and other rodents (mice, voles, shrews, etc.). The beaver (*Castor canadensis)* is also present and is a species of importance to the Blackfeet Tribe.

One stretch of Highway 89, located within the study area at the Kennedy Creek crossing, is outlined in a 2019 *Blackfeet Animal-Vehicle Collision Reduction Master Plan* as a priority location (ranked 3 on a 1 to 14 scale with 1 being the highest priority) (Fairbank et al. 2019). This area is noted to have high local conservation value due to its location within the Kennedy Creek drainage, a tributary to the St. Mary River. Blackfeet Fish & Wildlife Department noted in correspondences for this project that this is a heavy movement area for moose and other wildlife moving between the mountains to the west and the St. Mary River and wetlands/ponds to the east.

The study area includes suitable habitat for turtle, snake, and frog species due to the presence of adjacent aquatic habitats, some of which are likely influenced by hydrology from the St. Mary Canal System during the irrigation season. Based on available habitat, the western toad (*Anaxyrus boreas*), an aquatic amphibian SOC, has potential to be present within the watersheds crossed by the project and is typically found within riverine systems but has been known to be found in marshy creeks, oxbows, and wetland and floodplain pools.

3.5.3 Migratory Birds and Eagles

Several bird species documented within the study area are protected by the Migratory Bird Treaty Act (MBTA) and/or the Bald and Golden Eagle Protection Act (BGEPA). Habitat is present for numerous bird species along the entire length of the study area; the western portion of the study area includes forested habitat and dense shrub cover, and the eastern portion is predominantly grassland with intermittent shrub cover.

Bald and golden eagles, as well as other raptor species, have potential to use the study area. Suitable bald eagle habitat primarily includes forested areas along rivers and lakes, which are mostly limited to the western portion of the study area. Suitable golden eagle habitat primarily includes cliffs and large trees, and this habitat type is very limited throughout the study area. MTNHP records document observations of bald and golden eagles throughout a majority of the state; however, MTNHP does not record nest locations within the Blackfeet Indian Reservation (MTNHP 2025). MTNHP has documented observations of these species in the project vicinity with a high concentration of the observations located within Glacier National Park. Data on any documented observations or specific nesting locations was requested from the Blackfeet Nation Fish and Wildlife office; no response was received.

Several migratory bird species documented within Montana may occur within the study area. Possible species assemblages include waterfowl, shorebirds, songbirds, hawks, falcons, owls, and woodpeckers. Species adapted to open grasslands, riparian shrublands, aspen forest, wetlands, and open water are most likely to occur in the study area. Six species of birds designated as SOC in Montana have been observed within the study area (MTNHP 2025). These species include the veery (*Catharus fuscescens*), black tern (*Chlidonias niger*), Harlequin duck (*Histrionicus histrionicus*), Clark's nutcracker (*Nucifraga columbiana*), evening grosbeak (*Coccothraustes vespertinus*), and the common loon (*Gavia immer*).

3.5.4 Fish and Aquatic Resources

As noted in Section 3.4, many waterbodies and features are part of the study area, and each provides important habitat to fish communities. The canal is located adjacent to or crosses four streams that have the potential to provide habitat for fish. The canal is not hydrologically connected to these streams; their water flow remains separate and does not allow fish to be transferred into or out of the canal at these crossings, except for occasional flooding events. The canal flows through Spider Lake, which may provide suitable habitat for fish species during the growing season. The St. Mary River provides habitat for fish species; however, due to recent upgrades to the canal's inlet, fish are much less likely to enter the canal. Table 3-5 lists the streams and drainages associated with the project and their documented fish species.

A variety of fish and other aquatic species have the potential to be present within the study area. Habitat for aquatic species is abundant within the study area; however, within the canal, habitat is limited. The canal is not designed to provide long-term habitat for fish or other aquatic species. Individuals of species may become entrained within the canal and will exit the St. Mary Canal System when possible. Some individuals may become trapped and die during times of

low flow within the canal. Based on available data, Table 3-11 lists the fish species potentially present within streams in the study area.

Table 3-11. Documented Fish Species within Streams Crossed by Canal

Name	Potential Fish Species Present
St. Mary River	Alewife, bull trout, brook trout, burbot, chinook salmon, coho salmon, johnny darter, lake chub, lake herring, lake trout, lake sturgeon, lake whitefish, longnose dace, mountain whitefish, mottle sculpin, muskey, ninespine stickleback, northern pike, pink salmon, rainbow smelt, rainbow trout, Rocky Mountain cutthroat, Rocky Mountain sculpin, sea lamprey, slimy sculpin, smallmouth bass, spoonhead sculpin, spottail shiner, steelhead salmon, trout-perch, walleye, westslope cutthroat trout, white sucker, yellow perch
Kennedy Creek	Bull trout, brook trout, longnose dace, mountain whitefish, Rocky Mountain sculpin, trout-perch, westslope cutthroat trout
Powell Creek	No available data.
St. Mary Canal	Bull trout, brook trout, Rocky Mountain sculpin, spoonhead sculpin, trout-perch, westslope cutthroat trout
Spider Lake	Bull trout, mountain whitefish, trout-perch
Willow Creek	Brassy minnow, brook stickleback, fathead minnow, lake chub, longnose dace, northern redbelly dace, Rocky Mountain sculpin, white sucker
Cow Creek	Trout-perch
North Fork Milk River (Milk River)	Bigmouth buffalo, black bullhead, black crappie, blue sucker, bluegill, brassy minnow, brook stickleback, brook trout, brown trout, burbot, channel catfish, cisco, common carp, creek chub, emerald shiner, fathead minnow, flathead chub, freshwater drum, goldeye, Iowa darter, lake chub, lake whitefish, largemouth bass, longnose dace, longnose sucker, mountain sucker, Mottled sculpin, northern pike, northern redbelly dace, paddlefish, pallid sturgeon, pearl dace, plains minnow, rainbow trout, river carpsucker, sauger, shorthead redhorse, shortnose gar, shovelnose sturgeon, sicklefin chub, smallmouth bass, smallmouth buffalo, spottail shiner, stonecat, sturgeon chub, trout-perch, walleye, western silvery minnow, white crappie, white sucker, yellow perch

Sources: MTFWP 2023, MTNHP 2025, Gebhardt et al. 2002

Montana Fish, Wildlife, and Parks (MTFWP) does not maintain fisheries data on the Blackfeet Indian Reservation (MTFWP 2025). According to data available from MTFWP and the MTNHP, there are 15 species of fish with potential to be present within the study area, including five species listed as a potential SOC (PSOC) by the state of Montana (MTNHP 2025; MTFWP 2023). Of these species, the bull trout is listed as federally threatened and will be discussed further in the Threatened and Endangered Species section below. There are four SOC and one PSOC known to occur within the streams located within the study area. The five species are the trout-perch (*Percopsis omiscomaycus*), bull trout (*Salvelinus confluentus*), westslope cutthroat trout (*Oncorhynchus lewisi*), spoonhead sculpin (*Cottus ricei*), and lake trout (*Salvelinus namaycush*) (MTNHP 2025).

No known fish survey information exists for the St. Mary Canal System because it is not currently managed for fishery resources. The St. Mary Diversion Dam (Figure 3-1) has recently

been updated to include fish screens and a fish return to the St. Mary River. The inclusion of fish screens reduces the risk of fish entrapment within the St. Mary Canal System.

Kennedy Creek (Figure 3-14) is known to provide spawning habitat for bull trout as well as other fish species. The St. Mary Canal System flows beneath Kennedy Creek and does not converge with its waters during normal flows. During high flow or flooding events, waters from Kennedy Creek may overtop its banks and flow into the canal. These overflow events may cause individuals of fish and other aquatic species to become entrained within the St. Mary Canal System.

Powell Creek flows beneath the St. Mary Canal System through an existing underdrain (Figure 3-14). This stream may receive minor amounts of seepage from the canal that benefits its overall water levels. The existing underdrain likely does not impact aquatic species present within the stream. Powell Creek continues flowing southeast before converging with the St. Mary River.

Willow Creek and Cow Creek (Figure 3-14) are partially fed by seepage from the canal. The added water volumes to the streams through seepage are beneficial to aquatic species. A portion of both Cow Creek and Willow Creek are also conveyed beneath the St. Mary Canal System via existing underdrains. The existing underdrains likely do not impact aquatic species present within Cow Creek and Willow Creek.

Spider Lake (Figure 3-14) is fed predominantly by flows through the St. Mary Canal System from the St. Mary River. Any aquatic species present within this lake benefit from stable flows through the canal. Due to the lack of water inflow on a year-round basis, it is unlikely that larger fish/aquatic species live within this lake on a year-round basis. During times of low to no flow through the canal, Spider Lake's water levels often become too low for aquatic species. During this portion of the year, individuals may become trapped within the lake, and if water levels become too low, or oxygen levels within the lake become too low, these trapped individuals would likely die.

Fish and aquatic species within the North Fork Milk River benefit from the added flows delivered to the North Fork Milk River via the St. Mary Canal System (Figure 3-14). These additional flows lead to increased stability of water levels within the North Fork Milk River throughout the growing season.

3.5.5 Threatened and Endangered Species

The Endangered Species Act of 1973 (ESA) protects plant and animal species considered to be in danger of extinction and their critical habitats. An endangered species is defined as any species that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. A candidate species is defined as any species whose status is being reviewed to determine whether it warrants listing under the ESA. Federal agencies are required by Section 7(a)(2) to consult with USFWS on federal actions that may affect listed species.

In accordance with Section 7 of the ESA, a Biological Assessment (BA) is being prepared for this project. The BA includes an effect analysis of each federally listed species and identifies the mitigation commitments for each species, including construction phasing and timeframes. The St. Mary Canal System is part of the St. Mary Unit under Reclamation's management, and previous coordination has occurred for the overall operation and specific emergency actions.

For this project, the USFWS Information for Planning and Consultation (IPaC) web application was used to identify federally listed, proposed, and candidate species that may occur in the action area (Table 3-12). The action area was defined within the BA as the area that includes areas directly and indirectly affected by the federal action. For this project, the action area considered for terrestrial species is the same as the project area. The action area for the bull trout is limited to St. Mary Recovery Unit, while the project area is limited to Kennedy Creek.

On September 26–27, 2023, project environmental scientists visited the action area to review general site conditions and visually document habitat and signs of species. The project environmental scientists coordinated with the Blackfeet Tribe and the Blackfeet Wetland Manager, Emerald Grant III, who accompanied HDR on the field investigation.

Based on knowledge of species' habitat requirements, a desktop review of habitat, and observed habitat present during the site visit, project environmental scientists determined species likely to be present within the action area that should be considered further within the BA. As shown in Table 3-12, IPaC identified five federally listed species and one candidate species as potentially occurring in the action area. After a review of the habitat and coordination with USFWS, two of the five federally listed species and one candidate species were determined to likely be present in the action area. No critical habitat is present in the action area.

Table 3-12. Federally Listed Species and Critical Habitat in the Action Area

Common Name	Status	Potential to Occur	Critical Habitat	Habitat Description and Range in Action Area
Canada Lynx	T	No	No	Canada lynx prefers moist coniferous habitat above 4,000 feet in elevation. Low suitability in the action area.
Grizzly Bear	T	Yes	No	Grizzly bears can be found in woodlands, forests, alpine meadows, and prairies. In many habitats, they prefer riparian areas along rivers and streams. The action area provides moderate suitability. Grizzly bears are known to occur in the action area.
North American Wolverine	T	No	No	The action area does not provide suitable habitat or connectivity for wolverines and lacks the higher elevation that they prefer.

Common Name	Status	Potential to Occur	Critical Habitat	Habitat Description and Range in Action Area
Bull Trout and Critical Habitat	T	Yes	No	Bull trout spawn in the fall after temperatures drop below 48 °F in streams with cold water, clean gravel/cobble substrate, and gentle slopes. Spawning areas are associated with cold water springs or where flow is influenced by groundwater. May be present in the action area.
Whitebark Pine	T	No	No	Based on lack of habitat and field reconnaissance, there is no potential to occur in the action area.
Monarch Butterfly	C	Yes	N/A[1]	Monarchs have been reported throughout Montana. Presence of monarchs within the action area is unknown as no monarchs have been observed during field investigations.

[1] N/A = Not applicable. No critical habitat has been designated for this species.

Grizzly Bear

The grizzly bear (*Ursus arctos horribilis*) was listed as threatened under the ESA in 1975 in the conterminous 48 states (40 FR 31734). Habitat loss and human encroachment are the primary reasons for decline in grizzly bear populations (Reel et al. 1989). Presently, there are five regions where grizzlies are known to occur: Greater Yellowstone Ecosystem (GYE), Northern Continental Divide Ecosystem (NCDE), Cabinet-Yaak Ecosystem, Selkirk Ecosystem, and Northern Cascades Ecosystem. The action area is located within the NCDE Primary Conservation Area (PCA) grizzly bear recovery zone, Zone 1, Blackfeet Reservation Bear Management Unit (BMU). The NCDE is considered to contain the largest population of grizzly bears and is contiguous with populations in Canada (Costello et. al. 2023). In 2023, there were an estimated 1,163 grizzly bears in the NCDE Demographic Monitoring Area (DMA) (Costello et. al. 2023).

Grizzly bears are wide-ranging mammals requiring large areas of undisturbed habitat. Grizzlies occupy a wide range of habitat types and elevations throughout the year and will opportunistically occupy areas that can best meet their food requirements. Grizzlies prefer forested habitat that provides good cover (USFWS 2024). Home ranges can vary considerably, from approximately 11 to 2,000 square kilometers (7 to 1,245 square miles), and are dependent on food distribution (Reel et al. 1989). No critical habitat for grizzly bear has been designated within the action area.

Occurrence in Action Area

The action area lies within the NCDE PCA grizzly bear recovery zone, Zone 1, Blackfeet Reservation BMU. NCDE is the large ecological system containing and surrounding Glacier

National Park; it contains the largest grizzly bear population found in the lower 48 states and is connected to Canada. Critical habitat has not been designated; instead, the Interagency Grizzly Bear Committee (IGBC) issued habitat management guidelines within occupied grizzly bear habitat. Grizzly bears occurred historically throughout the area but were less common in prairie habitats (USFWS n.d).

Grizzly bears have excellent hearing and an even better sense of smell, with eyesight that is comparable to humans. This distance would alert bears to sights, sounds, and the smells of the construction site before entering the zone. In terms of habitat, the action area consists of low to moderately suitable habitat for grizzly bear (MTNHP 2023); however, grizzly bears now occur with greater frequency outside of NCDE recovery Zone 1. Grizzly bears are known to travel through the canal corridor and are known to occur within the action area. During the site visit in September of 2023, HDR biologists noted noticeable signs of bear activity, particularly between the St. Mary Diversion and Spider Lake. East of Spider Lake the habitat shifts to a more open habitat with less obvious signs of activity.

Bull Trout

USFWS defined a single distinct population segment (DPS) for bull trout (*Salvelinus confluentus*) within the conterminous U.S. and listed them as threatened under the ESA in 1999 (64 FR 58910). This single DPS is subdivided into six biologically based recovery units, of which the St. Mary River Recovery Unit includes the St. Mary River Basin from its headwaters to the international boundary with Canada (USFWS 2015).

On October 18, 2010, USFWS issued a final rule revising the designation of critical habitat for bull trout in the conterminous U.S. (75 FR 63898 through 64070), and developed implementation plans for the final bull trout recovery plan (USFWS 2015). In this final rule, the Reservation (among other Tribal lands) was excluded from critical habitat designation. Critical habitat exists within Glacier National Park and includes St. Mary Lake and several tributaries to St. Mary River.

Occurrence in Action Area

The Kennedy Creek Crossing would be the only portion of the action area that bull trout would inhabit, because they are known to use this tributary for spawning and migration. The St. Mary Canal System passes under Kennedy Creek through an inverted reinforced concrete siphon. Manufactured dikes upstream act to control channel migration. Kennedy Creek, a third-order stream, begins at Kennedy Lake and flows northeast before entering the St. Mary River downstream from Lower St. Mary Lake.

3.6 Historic Properties and Cultural Resources

Humans have inhabited northern Montana since the end of the last ice age, approximately 10,500 years ago. Oral histories and traditional cultural knowledge indicate a more extensive history of occupation. The history of the region is broadly divided into two periods—the Precontact Period and the Historic Period based on the arrival of Europeans and Euro-Americans. The earliest well documented evidence for humans in the region is the Clovis

Complex (ca. 10,500 to 10,000 years before present), although a potential pre-Clovis site has been identified at the Wally's Beach site on the St. Mary River near Cardston, Alberta. Limited evidence of Clovis age occupation has been found west of the project area within Glacier National Park, with clearer evidence of the Early Precontact Lake Linnet Complex and Red Rock Canyon Subphase. Lake Linnet marks the movement of populations from the Rocky Mountains, Columbia/Fraser Plateaus, and the Great Basin into the region, while the Red Rock Canyon Subphase is a local manifestation of the Foothills/Mountain Tradition observed in the Middle and Southern Rocky Mountains (Reeves 2003; Kornfeld et al 2010).

The Middle Precontact Period (ca. 7,750 to 1,600 years before present) showed a shift from the earlier emphasis on spear points to dart points and is locally divided into four subphases: Bellevue Hill, Many Glacier, Blue Slate Canyon, and the Waterton River Complex. These are manifestations of recognized technological traditions found in the wider Northwestern Plains. The Bellevue Hill subphase is the local variation of the Mummy Cave Complex, Many Glacier is the local version of the McKean Phase, the Blue Slate Canyon is the local form of the Pelican Lake Horizon, and the Waterton River Complex is coeval with the Besant Phase (Reeves 2003).

The transition from the Middle Precontact Period to the Late Precontact Period (ca. 1,600 to 300 years before present) is marked by the introduction of the bow and a resultant decrease in projectile point size used for arrows. The dominant group in the area during this period were the Pikáni (a group that includes the Blackfeet, Blood, and Peigan), although periodic visitation by the K'tunaxa, Coeur d'Alene, Salish, Upper Calispel, Colville, and Spokane to hunt bison is recorded. Traditional Pikáni winter camps are found along the mountain front in St. Mary and Two Medicine Valleys in Glacier National Park and in the Waterton area of Canada (Reeves 2003).

The Historic Period begins with the first known movement of Europeans and Euro-Americans into the region. The earliest such visitors to the area were likely fur trappers associated with either the Hudson Bay Company or the Northwest Company in the eighteenth century. The first well documented Euro-Americans in the region were the members of the 1805 Lewis and Clark expedition, whose July 22–26, 1806, camp (Camp Disappointment) along the Marias River is northeast of Browning. Small groups of trappers continued to frequent the area into the 1840s when the fur trade collapsed (MacDonald 2009). Permanent settlement by Euro-Americans began in the area in the mid-1870s when a number of trading posts were established along the St. Mary River (Reeves 2008).

The conditional approval of the Milk River Project occurred on March 14, 1903, by the Secretary of Interior under the Reclamation Act (PL 57-161, 32 Stat. 388). Chapter 1 discusses the historical background of the Milk River Project and St. Mary Canal System.

3.6.1 Previous Cultural Resources Investigations

Under Section 106 of the NHPA, the APE is defined as the area where direct and indirect effects could occur on historic properties and cultural resources (36 CFR § 800.16(d)). NRCS Montana currently defines the APE for this undertaking as the footprint of Alternatives 2 and 3.

This APE includes a 300-foot-wide corridor (150 feet either side of centerline) for the proposed canal, Kennedy Creek siphon modification, and wasteway modernizations; a 100-foot-wide corridor (50 feet either side of centerline) on O&M roads requiring modernization; a 1,000-foot diameter construction footprint centered on Drop Structures 1, 3, and 4; and a 100-foot buffer around the perimeters of two proposed material source pits near Babb. The diversion dam, St. Mary Siphon, Halls Coulee Siphon, and Drop Structures 2 and 5 are within the APE but are excluded from the current study because they have been repaired and replaced within the last 10 years or are in the process of being repaired and replaced under separate federal undertakings. Additional staging areas/laydown yards would likely be required for this undertaking, but these have not been identified and have not been included in the current APE. The APE is subject to refinement through development of NEPA and additional Section 106 consultation for the selected Alternative.

A Section 106 initiation letter for the project was sent to the Blackfeet Tribe, and the Blackfeet THPO to begin coordination of the project (see Appendix A6). A background literature review and limited structural field inventory of the St. Mary Canal System was then completed by HDR on behalf of NRCS Montana in the fall of 2023 and spring of 2024. In addition, the Blackfeet THPO provided Geographic Information System (GIS) data to HDR with data point locations of previously identified artifacts and features found along the St. Mary Canal System to assist the identification of unrecorded sites within the APE. The literature review identified 35 previous cultural resources inventories that overlap with the APE as it is currently defined (Table 3-13). The literature review also identified 44 archaeological sites within 0.5 mile of the project APE. Of these, 21 archaeological sites have been identified within the APE (Table 3-13).

Table 3-13. Cultural Resources Identified within the APE and NRHP Eligibility

Site No.	Resource Type	Resource Description	NRHP Eligibility
24GL0068	Historic	Vehicular/Foot Bridge	Unevaluated
24GL0069	Historic	Water Control Structure	Recommended Not Eligible
24GL0088	Historic	Vehicular/Foot Bridge	Unevaluated
24GL0155	Historic	St. Mary Canal	Determined Eligible
24GL0163	Historic	Vehicular/Foot Bridge	Determined Eligible
24GL0164	Historic	St. Mary Canal Siphon & Bridge	Determined Eligible (Destroyed)
24GL0178	Historic	Vehicular/Foot Bridge	Recommended Not Eligible
24GL0179	Historic	Vehicular/Foot Bridge	Recommended Not Eligible
24GL0846	Historic	U.S. Highway 89	Recommended Eligible
24GL1166	Multi-Component	Precontact/Historic Site	Recommended Eligible
24GL1168	Precontact	Animal Processing Area	Recommended Eligible
24GL1169	Precontact	Lithic Material Concentration	Recommended Eligible
24GL1170	Precontact	Animal Processing Area	Recommended Eligible
24GL1171	Precontact	Animal Processing Area	Recommended Not Eligible

Site No.	Resource Type	Resource Description	NRHP Eligibility
24GL1172	Precontact	Animal Processing Area	Recommended Eligible
24GL1173	Precontact	Animal Processing Area	Recommended Eligible
24GL1177	Precontact	Rock Cairn(s)	Recommended Not Eligible
24GL1178	Precontact	Rock Cairn(s)	Recommended Not Eligible
24GL1179	Precontact	Animal Processing Area	Recommended Eligible
24GL1786	Historic	Trash Dump	Recommended Not Eligible
24GL1787	Precontact	Rock Cairn(s)	Unevaluated

HDR completed a limited structural inventory on behalf of NRCS Montana in November 2023 of Alternatives 2 and 3 where repair and/or replacement of existing structural features on the St. Mary Canal are proposed. Approximately 614.20 acres (49.5 percent) of the APE has not been inventoried for cultural resources. In accordance with 36 CFR § 800.4(b)(2), NRCS Montana is currently working with consulting parties to develop a PA outlining a phased approach for further identification efforts for this undertaking. The PA for Section 106 compliance would be completed in accordance with 36 CFR § 800.14(b). The PA would establish the process to identify, evaluate, treat, and resolve any adverse effects on historic properties associated with this project. The stipulations of this PA would be followed during construction of the selected Alternative.

3.7 Visual Resources

The study area for visual resources is a 1-mile buffer on either side of the project area. A 1-mile buffer was chosen to account for potential impacts that may be visible from higher elevation areas within the vicinity of the project area. The study area includes areas of rolling Rocky Mountain foothills and open agricultural/grazing fields.

The study area generally transitions from forested areas with dense shrub cover in the approximate western half to grasslands and minimal shrub cover in the eastern half. Portions of USFWS's Glacier County Waterfowl Production Area may be visible from the western half of the St. Mary Canal System. Approximately the first 9 miles of the St. Mary Canal System is adjacent to forested areas. Glacier National Park is located approximately 4.5 miles west of the St. Mary Canal System and is visible throughout much of the study area, contributing to the visual quality. Highway 89 parallels the first 7 miles of the project. From the study area, Highway 17 branches to the west from Highway 89 and continues north to Chief Mountain and runs adjacent to Glacier National Park. No comments regarding visual impacts were gathered during public outreach conducted in 2023.

The view of the St. Mary Canal System within the project area varies dependent on the time of year and has been a part of the landscape for many years. The St. Mary Canal System generally has flowing water within it between the months of April and September. During winter months, the St. Mary Canal System is often empty or nearly empty with patches of standing

water remaining. The western half of the St. Mary Canal System has forested riparian buffers, adding variation to the overall viewshed along the St. Mary Canal System.

3.8 Public Safety

The study area for public safety is a 1-mile buffer on either side of the project area. North of Babb, there are two campgrounds (Pigeon Crossing and Glacier Elkhorn) located less than 0.5 mile from the St. Mary Canal System as well as Hook's Hideaway, which is a motel located approximately 500 feet from the St. Mary Siphon. Additionally, there are several residential properties near the St. Mary Canal System north of Babb, some of which are within 500 feet of the St. Mary Canal System.

The deteriorating condition of the St. Mary Canal System within the project area presents a safety concern. A St. Mary Canal System failure could cause water to flood out of the canal. With flows through the canal averaging 600 cfs, a breach has the potential to cause damage to adjacent properties. Failures along the St. Mary Canal System have been recorded in recent years in both 2020 and 2024. At the time of the 2020 Drop Structure 5 failure, the flow of the canal was already at a decreased level, flowing at approximately 200 cfs (or 1/3 of its flow capabilities), and water supplies within the canal were swiftly turned off to avoid additional damage to the land surrounding the failure area. Repairs on the St. Mary Canal System were completed in 22 weeks (about 5 months), during which time water was unable to flow through the canal, impacting the service area. In June of 2024, the St. Mary Siphon experienced a catastrophic failure (Figure 3-18). This failure occurred while the St. Mary Canal system was carrying 600 cfs, causing significant flooding and erosion. This failure also left washout areas between 30 and 50 feet deep, flooded local roadways and infrastructure, and posed a public safety hazard (MRJBC 2024a). Turning off water supply to the canal in an event such as a system failure during irrigation season takes on average 2 to 3 days before flows can subside.

Figure 3-18. Example of a 2024 St. Mary Canal System Failure (MRJBOC 2024)

The O&M roadway is largely used by O&M crews related to the St. Mary Canal System. However, members of the public are not barred from using this road; landowners, Tribal members, and others may use this road for a variety of reasons, including to access areas of the St. Mary Canal System for recreational purposes (e.g., swimming, fishing). Currently, the O&M roadway does not provide all-weather access, leaving many sections impassable during poor weather or wet conditions. This poses a safety threat to members of the public who may attempt to drive the roadway in poor conditions as well as staff performing O&M activities or accessing facilities. It is especially important that staff be able to reach infrastructure, such as wasteways and turnouts, during and immediately following storm events so they can manually release excess water from the canal if necessary. The O&M roadway can pose a safety threat during dry weather due to narrow width of access roads in some areas, saturation, and rutting/settling of the roadway subgrade.

3.9 Socioeconomic Resources

The study area for socioeconomic resources is the project area and service area. The analysis considered both the geographic location where the project would occur for potential direct effects, as well as the downstream counties that would benefit from the indirect effects of more reliable water.

The study area includes the Blackfeet Reservation in Glacier County, as shown in Figure 3-1. Additionally, Hill, Blaine, Phillips, and Valley Counties in the service area have social and economic links to the project area. Much of this landscape is used for agricultural uses, which are the driving forces of economic growth within the region. The agricultural lifestyle is key to the social dynamic of the communities serviced by this project.

3.9.1 Local and Regional Economy

Local Economy

The local economy includes Glacier County and the Blackfeet Reservation. The project area is completely within Census Tract 9404. These areas are supported largely by agricultural activities (much like the general regional economy). Agriculture is a large industry on the Blackfeet Reservation. The 2012 Census of Agriculture shows that the market value of agricultural products raised on the Reservation was $115,551,000 (Blackfeet Nation 2018b). Other job sectors that provide the highest percentage of employment within Glacier County and Census Tract 9404 include educational services, healthcare, and social assistance; arts, entertainment, and recreation; accommodation and food services; and public administration. The agricultural job sector shows a higher percentage of workers within the Census Tract (at 12.0 percent) than for Glacier County (7.5 percent) and the Blackfeet Reservation (7.3 percent) (U.S. Census Bureau 2021c).

Table 3-14. Percent of Total Adult Working Population by Sector

Job Sector	Glacier County	Blackfeet Reservation	Census Tract 9404
Agricultural, forestry, fishing and hunting, and mining	7.5	7.3	12.0
Construction	4.8	5.0	6.2
Manufacturing	1.6	0.7	0.6
Wholesale Trade	0.7	0.1	0.0
Retail Trade	12.5	12.5	6.7
Transportation and warehousing, and utilities	2.4	1.6	1.9
Information	0.8	0.5	0.3
Finance and insurance, and real estate and leasing	2.9	2.8	4.4
Professional, scientific, and management, and administrative and waste management services	2.4	2.2	2.6
Educational services, and health care and social assistance	32	33.3	31.1
Arts, entertainment and recreation, and accommodation and food services	13.4	14.9	20.7
Other services, except public administration	2.5	2.5	3.5
Public administration	16.6	16.6	10.1

Source: U.S. Census Bureau 2021c

Regional Economy

The regional economy includes the service area. The regional economy is influenced heavily by the agriculture economy. Much like the project's local economy, agriculturally based careers are one of the largest employment sectors within the region; however, it is often not the largest employer. U.S. Census data for employment by job sector for the four counties within the service area is presented in Table 3-15.

Despite not being the largest employer, agriculture plays a large part in the regional economy. Agricultural production made possible by St. Mary River water delivery from the St. Mary Canal System to the Milk River is an important economic driver in the service area. The St. Mary River water supports irrigation of lands that produce crops (alfalfa and barley) and pasture for grazing livestock.

Table 3-16 outlines the estimated value of farms within the service area to be nearly $300 million. Irrigation shortages affect this regional economy by changing the production of the agricultural areas and the producers' approach to diversifying the type of crops on their land (Reclamation 2023d).

Table 3-15. Percent of Total Working Adult Population by Sector

Job Sector	Blaine County	Hill County	Phillips County	Valley County
Agriculture, forestry, fishing and hunting, and mining	14.8	7.3	28.0	14.6
Construction	7.9	6.0	5.6	7.8
Manufacturing	0.0	1.0	0.0	1.9
Wholesale Trade	0.0	1.8	0.0	2.9
Retail Trade	12.1	10.2	10.8	11.6
Transportation and warehousing, and utilities	3.3	11.2	6.7	8.3
Information	1.4	3.8	0.2	1.0
Finance and insurance, and real estate and rental and leasing	6.5	3.8	1.0	5.0
Professional, scientific, and management, and administrative and waste management services	4.1	6.7	5.7	7.7
Educational services and health care and social assistance	27.2	24.2	16.8	22.3
Arts, entertainment and recreation, and accommodation and food services	5.1	11.9	10.7	7.4
Other services except public administration	6.1	4.9	5.3	4.5
Public administration	11.0	7.4	8.9	5.2

Source: U.S. Census Bureau 2021c

Table 3-16. Number of Farms and Value of Agricultural Products

	Hill County	Blaine County	Phillips County	Valley County	TOTAL
Number of Farms	802	546	507	654	2,509
Farm Acres	1,597,982	2,204,248	2,066,540	1,634,642	7,503,412
Value ($ million)	$86.6	$71.6	$60.9	$80.4	$299.5

Note: Information is for the entire counties and not just Milk River Project irrigators.
Source: Reclamation 2019 and Reclamation 2012

Value of Water

Water from the St. Mary Canal System accounts for much of the water delivered to Fresno Reservoir. Water from Fresno Reservoir is used largely for two categories, either agricultural irrigation (90.1 percent of total annual use) or municipal/industrial (M&I) and rural domestic (0.4 percent of total annual use). The value of water to the beneficiaries has been calculated by Reclamation and HDR in the equivalent of 2025 dollars. Water within this system used for agricultural irrigation is valued at $69.64/per acre-foot of water. M&I and rural domestic water use is valued at $301.43/per acre-foot. These values were based on the willingness of beneficiaries to pay for its use as well as taking into consideration the next best alternative source (see Appendix D5).

Recreational Use

Flows from the St. Mary Canal System are integral to the Fresno Reservoir, located downstream along the Milk River. Data shows that Nelson Reservoir depends on the Fresno Reservoir for approximately 18 percent of its surface area. As described in the analysis presented in Appendix D5, 75 percent of total visitors to these reservoirs are anglers; other visitors partake in activities such as camping and hiking. The average annual number of recreational visits to the two reservoirs was found to be approximately 18,586 (Fresno) and 21,355 (Nelson) visits per year under current water delivery levels of the canal. Approximately 22,660 visitors per year are affected by water inflows to Fresno Reservoir. The number of visitors to the reservoirs can be correlated to the average flow delivery each year to Fresno and Nelson Reservoirs, with increased flows leading to increased visits. The average value of a recreational day at both reservoirs was calculated to be $48.60 per visitor (see Appendix D5).

3.10 Ecosystem Services

Per PR&G requirements, an ecosystem services framework is required to provide an integrated approach for evaluating the benefits and trade-offs of alternatives on ecosystem services (USDA 2017a). Ecosystem services refer to the benefits that people and their communities derive from the natural environment in which they live. Ecosystem services are based on four service categories (USDA 2017a):

- *Provisioning Services*: Services that provide tangible goods for direct human use and consumption (e.g., food, fiber, water, timber, biomass).
- *Regulating Services*: Services that maintain a world in which people can live, providing critical benefits that buffer against environmental catastrophe (e.g., flood and disease control, water filtration, climate stabilization, crop pollination).
- *Cultural Services*: Services that make the world a place in which people want to live (e.g., spiritual, aesthetic viewsheds, Tribal values).
- *Supporting Services*: Services that refer to the underlying processes maintaining conditions for life on Earth (e.g., nutrient cycling, soil formation, primary production).

These ecosystem services contribute to people's overall quality of life but often cannot be monetized in the same way as services sold in marketplaces. Therefore, federal investment into projects that could impact ecosystems and natural resources requires an ecosystem services assessment to illuminate how management decisions would enhance, sustain, or degrade the benefits that nature provides. An assessment of links between ecological function and social well-being helps make certain that a project's beneficial ecological impacts are recognized and that detrimental impacts on the natural environment are minimized, to the extent possible (USDA 2017a).

Figure 3-19 highlights different ecosystem services related to improved water supply and links each service to its change in ecological features and its benefit or social value. Supporting services are not evaluated in this Plan-EIS because they give rise to and support the final ecosystem services (Provisioning, Regulating, and Cultural) (USDA 2017a). Project scoping (see Chapter 2) led to the determination of the ecosystem services (or resources of concern) considered in the Plan-EIS.

St. Mary River water serves a number of different lands that provide a variety of ecosystem services:

- *Provisioning Services – Water Rights and Water Supply.* Measures would help provide more secure and reliable irrigation and municipal water supply. Modernization would allow for diversion of 850 cfs, as originally designed, versus the current diversion of 600 to 650 cfs. Increasing the water quantity through the irrigation infrastructure would increase provisioning services through an increase in water availability ecosystem services via an increase in irrigation and municipal water supply. Water from the St. Mary River is diverted into the canal and conveyed to patrons for agricultural and municipal purposes. The water diverted into the St. Mary Canal System is used for activities such as domestic use, food production, feed production, and maintenance of agricultural lands.

- *Regulating Services – Terrestrial and Aquatic Species.* St. Mary River water provides a source of water for wildlife within the analysis area and surrounding lands. Water availability is a key factor in habitat choice for many species and is highly indicative of the area's species richness. The presence of wildlife within the area provides increased opportunities for recreational activities, such as wildlife viewing and hunting. Additionally, wildlife is an important piece of cultural value within the area, including Tribal culture and history. The abundance of species present within the project area helps to create and maintain an overall healthy ecosystem, both locally and regionally. Wildlife species themselves provide ecosystem services, such as pollination, soil aeration, habitat creation, and many others. Vegetated riparian buffers, such as riparian forest buffers found along portions of the canal, can help to regulate water temperatures by shading the water from the sun during peak daylight hours. This temperature regulation benefits fish and other aquatic species as well as overall water quality. Buffers provide an important source of habitat for many wildlife species found within the project area and surrounding landscape. These riparian forests can provide habitat for large and small

mammals, migratory birds, reptiles and amphibians, and others. Aquatic and riparian habitats downstream along the North Fork Milk River and Milk River benefit from the flow provided by the canal. The vegetation that grows within wetlands associated with these waterbodies allows for breeding habitat for aquatic and semi-aquatic species in the area.

- *Cultural Services – Recreation*. St. Mary River water allows for the North Fork Milk River and downstream waterbodies, such as Fresno Reservoir, to have adequate water for aquatic life and recreational activities. Activities provided by adequate flows may include fishing, boating, swimming, and other outdoor activities. Water availability has a large influence on the vegetation community surrounding the project area and provides aesthetic views. Recreation opportunities related to wildlife are important to this region of Montana. The presence of large game species within the area creates the opportunity for hunting activities. The presence of fish species within the St. Mary River, the North Fork Milk River, Milk River, and associated reservoirs makes fishing a popular activity in the region.

- *Cultural Services – Landscapes, Landforms, and Traditional Use Areas of Cultural Significance.* The project area lies at the heart of Blackfeet ancestral territory, and activities in these watersheds directly affect culturally significant landscapes, landforms, and traditional use areas. Water resources in the Milk River Basin area are important to the histories and cultures of the region. The waters that flow through the canal allow the communities throughout the region to thrive. Plant and animal resources in and adjacent to the project area are integral to the history of the Blackfeet Tribe and Montana. Wildlife has been, and still is, an important subject of Native American artwork. Similarly, there are many plant species in this area that are traditionally gathered for ceremonial and daily use by Blackfeet Tribal members. Additionally, large and small game species made it possible for the Blackfeet Tribe and early settlers to succeed in the area. To this day, residents on the Blackfeet Reservation continue to subsistence hunt, fish, and gather in the project area and adjacent lands. These resources serve important roles in the Blackfeet traditions and culture. Aesthetically pleasing viewsheds are often associated with spiritual or recreational activities as well as tourism. In some cases, aesthetic viewsheds hold sacred meaning to the ancestral inhabitants of the area. They also allow for a view into the past of what the landscape once was prior to development and other human-associated activities.

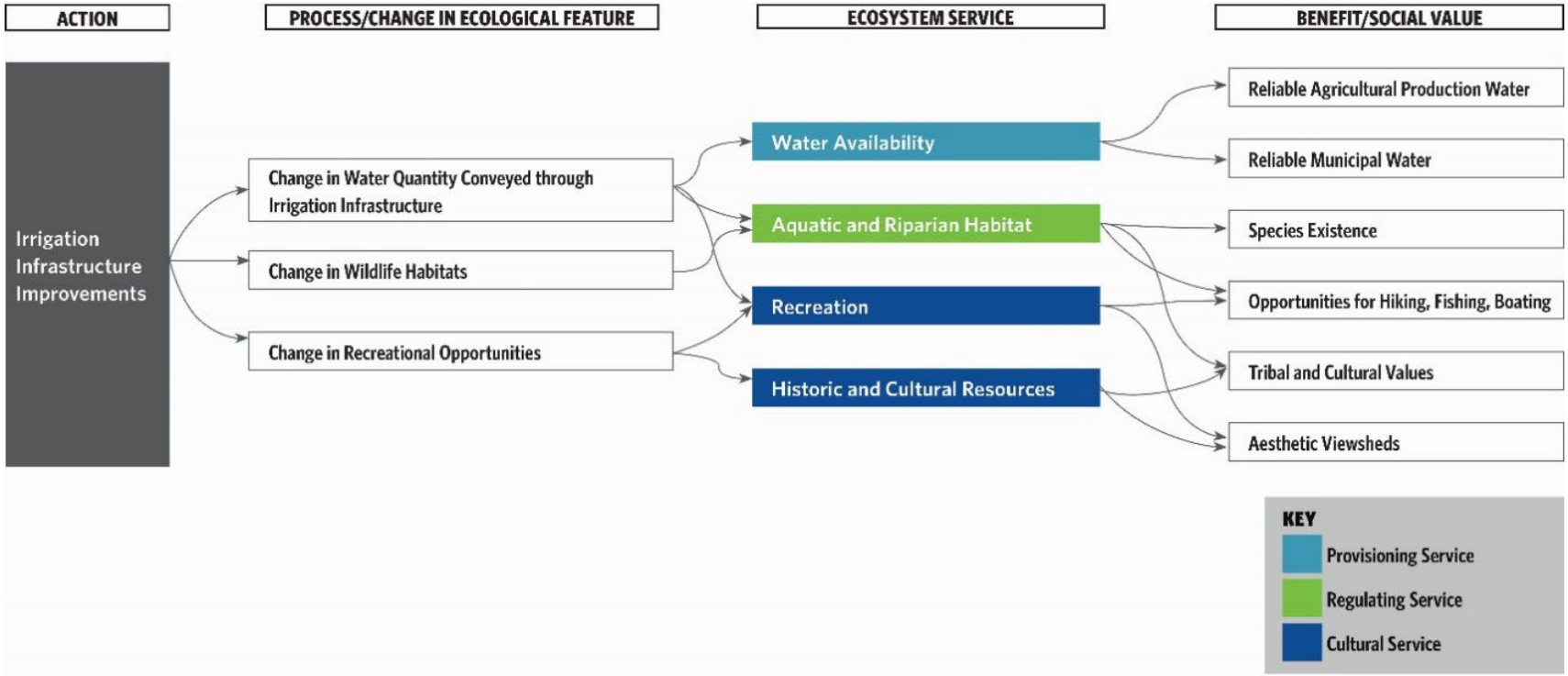

Figure 3-19. Ecosystem Services Matrix

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4 Alternatives

Chapter 4 describes how alternatives were formulated, evaluated, and screened and describes the alternatives carried forward for detailed analysis. Local, State, regional, federal, and non-governmental agencies and organizations participated in the formulation process.

A range of alternatives was developed to satisfy applicable alternatives analysis requirements, reduce time and costs, and streamline agency reviews. Table 4-1 describes each of these requirements.

This analysis satisfies the alternative development and screening criteria requirements of NEPA, Reclamation CMP 09-02, Department of Interior (DOI) Agency Specific Procedures (ASP), and USDA-NRCS ASP DM 95000-013. Additional details about alternative evaluation are provided in Appendix D3.

Table 4-1. Federal Requirements for Alternatives Analyses

NEPA[1]	PR&G[2]
NEPA requires federal agencies to assess the environmental effects of proposed major federal actions prior to making decisions.	Alternatives analysis requirements when federal funds are used for water projects. Agencies have specific guidelines, including USDA NRCS, who is providing funding for this Plan-EIS.

[1] CEQ NEPA Regulations, 40 CFR Parts 1500-1508

[2] Principles and Requirements are established pursuant to the Water Resources Planning Act of 1965 (P.L. 89-8), as amended (42 U.S.C. 1962a-2) and consistent with Section 2031 of the Water Resources Development Act of 2007 (P.L. 110-114).

4.1 Alternatives Formulation and Screening

As discussed in Chapter 1, irrigated agriculture and agricultural communities served by the Milk River Project have unreliable access to St. Mary River water and are not receiving their full allocated water right. MRJBOC is pursuing PL-566 funding to alleviate the agricultural damages that these communities are experiencing now and into the future. Extensive work with stakeholders and agencies over the last few decades has been on-going in both the St. Mary and Milk River Watersheds by federal, State, and local interests (such as the MRJBOC) to look at options on how to address the agricultural impact of unreliable St. Mary River water. The formulation of alternatives for this Plan-EIS was built on this previous work that has been completed.

Initial alternatives, including nonstructural alternatives, that were formulated included:

- Irrigation District Conveyance and On-Farm Efficiency Improvements
- Enhanced Fresno Reservoir Storage
- Water Right Policy Amendments

- Water Right Acquisition
- Reduction in Irrigated Acres
- Modernize the St. Mary Canal System
- No Action (as required by NEPA for comparison of alternatives)

When screening alternatives, it was first determined whether the alternative is reasonable, such that the alternative is technically and economically feasible and meets the purpose and need for the proposed action (40 CFR 1508.1). Alternatives were then analyzed to determine if they meet the PR&G formulation criteria.[3] More information on the alternative formulation and screening process can be found in Appendix D3.

4.2 Alternatives Considered but Eliminated from Detailed Study

The initial array of alternatives was screened to determine if they meet the purpose and need and PR&G criteria. Because of the unique way in which the Milk River Project works, unless St. Mary water is available, the purpose and need and components of the PR&G screening criteria cannot be met. The following alternatives were considered but eliminated from further analysis (see Appendix D3 for more detail):

- Increase irrigation district conveyance efficiency and on-farm efficiency – This alternative does not meet the purpose and need due to not addressing the unreliable access to St. Mary River water, and it would not be complete or effective to the extent that it addresses the identified purpose and need.
- Increase storage options for irrigation district distribution – This alternative does not meet the purpose and need due to not addressing the unreliable access to St. Mary River water, and it would not be complete or effective to the extent that it addresses the identified purpose and need.
- Change in water right policies and international water right agreements – This alternative is not reasonable to implement due to the implementation of State or international water rights being beyond the ability of MRJBOC to be party to these agreements. Therefore, this alternative would not be complete or effective to the extent that it addresses the identified purpose and need.
- Changes in type of agriculture production – This alternative does not meet the purpose and need due to not addressing the unreliable access to St. Mary River water, and it would not be complete or effective to the extent that it addresses the identified purpose and need.

[3] These alternatives were analyzed for four criteria: completeness, effectiveness, efficiency, and acceptability. Some of the initial alternatives considered did not meet these formulation criteria and were eliminated from further analysis (see Appendix D3).

The No-Action Alternative and alternatives that would focus on modernizing the St. Mary Canal System were carried forward to be considered for detailed analysis.

4.3 Alternatives Considered for Detailed Study

After determining that the No-Action Alternative and alternatives focusing on modernizing the St. Mary Canal System would be carried forward for detailed study, additional screening and development of the alternatives occurred. The following subsections describe the development of the alternatives and provide detailed descriptions of the alternatives considered for detailed analysis. See Appendix D3 for additional details regarding the development of the alternatives.

4.3.1 Development of Alternatives

As described in Chapter 1, Milk River Project beneficiaries need reliable access to St. Mary River water. The St. Mary Canal System is the only conveyance infrastructure available to move water from the St. Mary River to the Milk River. Currently, the St. Mary Canal System has issues with conveyance capacity, seepage, and reliability. Because of these issues, the St. Mary Canal System is unable to consistently deliver Milk River Project beneficiaries their allotted water right. This inability decreases Milk River Project beneficiaries' flexibility in water management and timing that is necessary to support agriculture, and it limits the ability to address climate and drought resiliency. Modernizing the St. Mary Canal System would address the purpose and need and would be aligned with the general purpose of P.L. 566, which states "furthering the conservation, development, utilization, and disposal of water."

The St. Mary Canal System is made up of many different components (siphons, Drop Structures, etc.) that are necessary for the system to function. These components, also referred to as "measures," are integral to the St. Mary Canal System to ensure reliable delivery of St. Mary River water. The following subsections provide additional information regarding the measures that make up the St. Mary Canal System and the development and screening of measures that were combined to form the alternatives considered for further analyses.

St. Mary Canal System Measures

The St. Mary Canal System consists of an earthen canal, three siphons, five Drop Structures, the access road, wasteways, and underdrains. The length of the St. Mary Canal System from the diversion of the St. Mary River to the discharge into the North Fork Milk River is 29 miles. The canal and related structures were designed to convey 850 cfs, in accordance with existing water rights. The canal water exits from Drop Structure 5 into the North Fork Milk River (Reclamation 2024). The St. Mary Canal System includes the following measures:

- The *Canal Prism* was constructed between 1907 and 1915 with a design capacity of 850 cfs. The 29-mile canal is an earthen, unlined, one-bank, contour design (see Appendix D3).
- The *Kennedy Creek Siphon* consists of a 200-foot long, 10-foot by 10-foot reinforced concrete barrel (RCB) (Reclamation 2023).

- The *St. Mary Siphon* was replaced in the summer of 2025 with construction at the site to be completed in 2026 and consists of two 90-inch steel barrels that traverse the valley from the inlet to the outlet. The barrels are approximately 3,200 feet in length and the discharge of each barrel is 425 cfs (see Appendix D3).
- The *Halls Coulee Siphon* is currently being replaced and crosses a broad valley approximately 8 miles downstream of the St. Mary Siphon. The siphon consists of 2 steel barrels that are 6.5 feet in diameter and 1,405 feet long (see Appendix D3).
- The *Drop Structures* deliver water to the Milk River. The canal achieves energy dissipation by dropping a total of 218 feet through a series of five Drop Structures. Drop Structures 2 and 5 were replaced in 2020 (see Appendix D3; MRJBOC 2020).
- The *O&M Road* is currently either a two-track path or the Canal Trail. The road runs the entire length on either side of the canal, allowing access for O&M activities.
- *Wasteways, Spillways, and Drains* serve as protective structures and facilitate the release of excess canal water when water rises above a certain level or when one component of the canal fails and water needs to be released. Drains located along the canal are not used for irrigation water delivery and, instead, are for dewatering during maintenance or system failure. The St. Mary Canal System originally included two wasteway structures that were designed to release/discharge the canal design flow. One is located downstream of the Kennedy Creek Siphon and the second is located upstream of the Halls Coulee Siphon. Both were designed for the manual release of water from the canal via manually operated gates (not designed for automatic spilling). Spillways allow for water to overtop the canal and flow out during high flow events; no manual release of water is necessary (see Appendix D3).
- *Underdrains (Culverts)* are protective structures that convey major natural drainages under the canal. The underdrains prevent additional water from entering the canal uncontrolled. The canal includes seven major underdrain structures (see Appendix D3).

Development and Screening of Measures

To better understand the issues associated with the St. Mary Canal System components and conveyance issues, MRJBOC completed a System Improvement Plan (SIP) in 2022 for the St. Mary Canal delivery system with support from NRCS (MRJBOC 2022). The SIP identified issues associated with the multiple St. Mary Canal System components. During the PL-566 process, this initial engineering was used to develop measures that could then be combined to develop alternatives focused on modernizing the St. Mary Canal System.

Measures were considered individually and screened for reasonableness, purpose and need, and PR&G requirements.[4] Some measures, such as including fencing to prevent animal

[4] Measures that do not address the purpose and need for action, do not achieve the Federal Objective and Guiding Principles, or become unreasonable because of cost, logistics, existing technology, or environmental reasons may be removed from consideration (NRCS 2024 [Section 501.37]).

intrusion, did not meet screening criteria and were not carried forward. See Appendix D3 for more details on development and screening of management measures. A description of the measures that were carried forward after screening are summarized in Table 4-2.

Table 4-2. Summary of the Current Condition of the Measures and Potential Modernization

Measure	Current Condition of the Measure	Potential Modernization of the Measure
Canal Prism	The canal is the shape of the excavated channel, or ditch. The canal has a total length of 29 miles. When constructed, only one side of the canal was constructed with an earthen berm, as the natural topography was used to form the other side. The area of the canal was designed and constructed to convey the full water right allocation of 850 cfs from the St. Mary River. Due to sloughing (erosion) of the canal embankment, the capacity of the canal has been reduced to 600 to 650 cfs. In addition, due to the natural topography acting as the right bank, the original design of the canal embankment results in an inefficient canal prism shape. This increases the opportunity for losses due to seepage and evaporation.	Reshaping of the canal prism would create a consistent channel bottom and side slopes that would convey the water within a defined area, increasing the capacity.
Canal Lining	Seepage through the bottom and/or sides of a canal lining is common and expected. However, due to the geology of the first 9 miles of the canal from the St. Mary Diversion Dam to the St. Mary Siphon intake, conditions exist for higher than acceptable seepage to occur.	Consider lining the first 9 miles of the canal bottom and side slopes with a geosynthetic liner.
Siphon Modification	Kennedy Creek Siphon allows the canal to cross under Kennedy Creek. The existing siphon is noted as lacking conveyance, resulting in the St. Mary Canal reducing its capability of mobilizing the fine sediment recruited within the St. Mary Canal, further exacerbating the lack of conveyance. Additionally, the age of the siphon means there is also a risk of failure and reliability.	Adding a 10-foot-by-10-foot reinforced concrete box (RCB) parallel to the existing siphon. Rehabbing the existing siphon, which may include coating, slip lines, or patching.
Drop Structure Replacement	Due to age and deteriorating conditions, the Drop Structures represent an opportunity for a system failure. Drop Structures 1, 3, and 4 need to be replaced with new structures, similar to the recent replacement of Drop Structures 2 and 5.	Drop Structures 1, 3, and 4 would have the concrete flume replaced. The flumes would be slightly realigned, overlapping with existing.

Measure	Current Condition of the Measure	Potential Modernization of the Measure
O&M Road Improvements	The O&M road runs the length of the St. Mary Canal System and is a low-maintenance dirt road. It is generally not wide enough or at a condition that allows for O&M activities or the maneuvering of construction equipment during more in-depth maintenance. During construction of each measure, improved construction access would be required.	Improve access road on north and/or south side of St. Mary Canal System would be integrated into the construction access requirements for other measures. The post-construction condition ad would be a 12-foot-wide, all-weather access road with 6 inches of compacted gravel surfacing.
Wasteways, Spillways, and Drains	The St. Mary Canal System includes two wasteways. The two wasteways are channels that carry off excess water from the St. Mary Canal System. Both wasteways were designed for manual release of water from the canal via manually operated gates, the gates are currently not operational. There are five existing grassed spillways along the St. Mary Canal System. These spillways are locations where water may overtop the canal at vegetated sections of the canal's alignment. The St. Mary Canal System includes the eight drains that are old, deteriorated and are no longer conveying the drainage needed.	Wasteway replacement is integral to canal reshaping. Wasteway sizing would be reviewed during final design and increased if needed. Most of the spillways along the canal would be replaced during the reshaping of the canal prism. Spillways would also be added in appropriate locations as described in Appendix D3. Drains would be replaced to the needed capacity, based of watershed runoff estimates with contingency.
Underdrains (Culverts)	The underdrains convey streams or larger drainages underneath the canal. The current underdrains do not meet the 25-year event and need to be adjusted to this design standard. The St. Mary Canal System includes seven major underdrain structures.	Replace underdrains along the St. Mary Canal System to meet the 25-year event. Underdrain replacement is integral to the canal reshaping. Culverts would be replaced in existing locations and the size of each would be increased by 6 inches, unless a larger size is needed to meet the 25-year event.
Slope Stability (Slide Mitigation) (Locations between the St. Mary Siphon and Drop Structure 1)	Locations have been identified along the St. Mary Canal System that need slope stability measures.	Address 14 slope stability areas identified by geotechnical site investigations.

Identification of Two Modernization Alternatives

The measures that met the screening elements were combined to form alternatives for a detailed analysis. Detailed analysis includes a refined preliminary design, analysis of environmental and social consequences (both beneficial and detrimental), and a detailed economic analysis.

4.4 Description of Alternatives

The following sections describe the alternatives carried forward for detailed environmental and economic analyses.

4.4.1 Alternative 1 – No Action (Future without Federal Investment[5])

Under the No-Action Alternative, federal funding through P.L. 83-566 would not be available to implement the project. MRJBOC would continue to operate and maintain the existing system in its current condition. This alternative assumes that modernization of MRJBOC's system to meet the purpose and need of the project would not be reasonably certain to occur. For the purposes of this Plan-EIS, the No-Action Alternative is a continuation of standard operating procedures.

The No-Action Alternative would not meet the purpose and need for the project. There would be no water conveyance improvement, no reduction in water loss due to seepage, and no improvement to water delivery reliability for water users. Operational inefficiencies, risk of infrastructure failure, and water delivery would remain the same and likely worsen over time. The No-Action Alternative would not accomplish the Federal Objective of maximizing sustainable economic development, minimizing social impacts, and protecting the environment. However, as required by NRCS and CEQ, the No-Action Alternative (Future without Federal Investment [FWOFI]) is carried forward for comparative purposes.

4.4.2 Alternative 2 – Canal Modernization, Line/Reshape (Future with Federal Investment[6])

Under Alternative 2, federal funding through P.L. 83-566 would be available, and the St. Mary Canal System would be modernized. Alternative 2 would have a permanent impact footprint of approximately 344.83 acres and temporary impact area of approximately 357.38 acres for a total of 702.21 acres.

Alternative 2 would meet the purpose and need and would contribute to the Federal Objectives and Guiding Principles by:

- **Improving water delivery reliability to water users** – Modernizing the St. Mary Canal System would improve operational irrigation and municipal water delivery for beneficiaries served by the Milk River Project. Alternative 2 would improve water availability and drought resilience for users throughout the MRJBOC area.
- **Improving water conservation** – Modernizing the canal would reduce water loss from seepage and evaporation.

[5] In a PR&G analysis, this benchmark is known as the Future without Federal Investment (FWOFI). FWOFI does not assume that existing conditions continue as-is into the future. Rather, it is the most likely future condition if no change to existing activities occur, and it includes any changes expected to directly, indirectly, or cumulatively result from all reasonably foreseeable actions without any of the analysis' alternatives (USDA 2017a).

[6] Future with Federal Investment (FWFI) considers if the alternative were implemented.

- **Reducing risk of infrastructure failure** – Drop Structure replacement, stabilization of landslide areas, and siphon modification would reduce the risk of infrastructure failure associated with the age of the features in the current system that are required to deliver water through the canal.

Reclamation owns, operates, and maintains the current St. Mary Canal System infrastructure included in Alternative 2. Reclamation would temporarily transfer operation, maintenance, and replacement of infrastructure to MRJBOC if any infrastructure were to be selected as part of a preferred alternative and funded through PL-566. Similar transfers have occurred with the St. Mary Siphon and St. Mary Canal portions at Drop Structures 2 and 5. A letter from Reclamation to MRJBOC confirming this transfer plan is included in Appendix E2.

The following measures would be installed under Alternative 2.

Lining and Reshaping

The canal would be reshaped from the St. Mary Diversion Dam to the St. Mary Siphon intake, from the St. Mary Siphon outlet to the Halls Coulee Siphon inlet (with no reshaping along Spider Lake), and from the Halls Coulee Siphon outlet to the Drop Structure 1 intake (approximately 20 miles). The canal would not be reshaped between the Drop Structure 1 outlet and the Drop Structure 5 inlet. Reshaping includes improving the existing embankment to establish the minimum required freeboard (distance from the channel's maximum water level to the top of the bank) in the canal and construct a new embankment on the "uphill" side of the canal (see Figure 4-3). A typical cross section of the proposed reshaped canal is shown in Figure 4-1.

The cross section of the canal would be shaped at a stable slope that earthen material would hold sufficiently without the need for riprap or immediate vegetative coverage. The proposed lining and reshaping activities would occur along the existing canal alignment. The existing canal alignment would be modified in areas to increase stability and minimize cut/fill activities. Figures are available in Appendix C1 that show the footprint of the associated grading and the ROW limits. Fill materials used for cut/fill activities would be sourced from excess materials removed from landslide areas along the canal. Vegetation and tree removal would be conducted, where necessary, for construction activities and access. Standardized best management practices (BMP) would be used, including washing all organic debris/mud/dirt off construction related equipment and vehicles prior to entering and exiting the project area, avoiding driving and walking within areas of heavy noxious weed presence, and destroying removed vegetation in heavily weeded areas following vegetation removal. Topsoil would be stockpiled for site remediation following construction, when possible. Soil stockpiles would not be left unvegetated for longer than necessary or would be covered. Topsoil in areas of heavy noxious weed/invasive species presence would be removed and replaced with topsoil from elsewhere within the project area. Topsoil tainted with noxious weed coverage would be disposed of at an approved facility.

Work areas near waterbodies would use USACE BMPs related to erosion and sediment control. These BMPs include:

- Erosion control materials used in or adjacent to WOTUS being comprised of degradable material to ensure decomposition;
- No material that includes stabilized netting or stabilized open mesh, this applies to wattles, rolled materials, and bank wraps;
- Using erosion control blankets or fabrics that break down within 24 months.

Non-degradable blankets/fabrics may be allowed on a case-specific basis if the blankets/fabrics are buried beneath riprap or structures and are not likely to be exposed. Non-degradable blanket/fabric that becomes exposed within WOTUS must be removed (USACE 2021).

Under Alternative 2, a geosynthetic liner would be installed along the bottom width and on the side slopes from the St. Mary Diversion Dam to the St. Mary Siphon intake (approximately 9 miles). The liner would extend approximately 2 feet on either side of the side slopes (Figure 4-2). The remaining approximately 20 miles of the canal would not be lined (Figure 4-1).

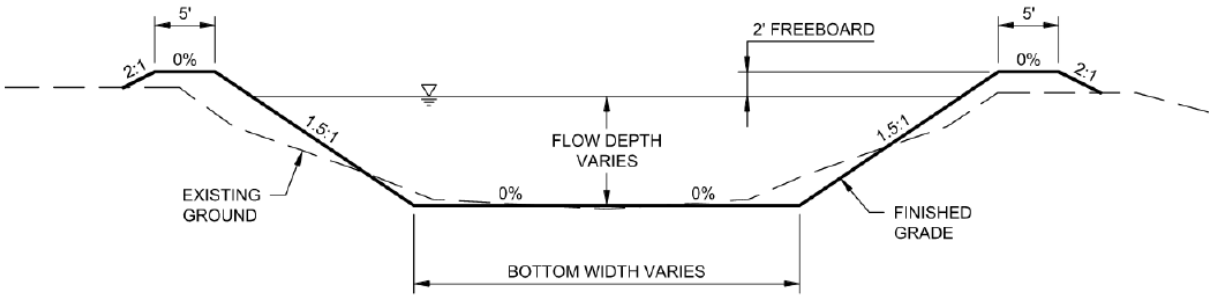

Figure 4-1. Proposed Typical Section to the Canal without Lining

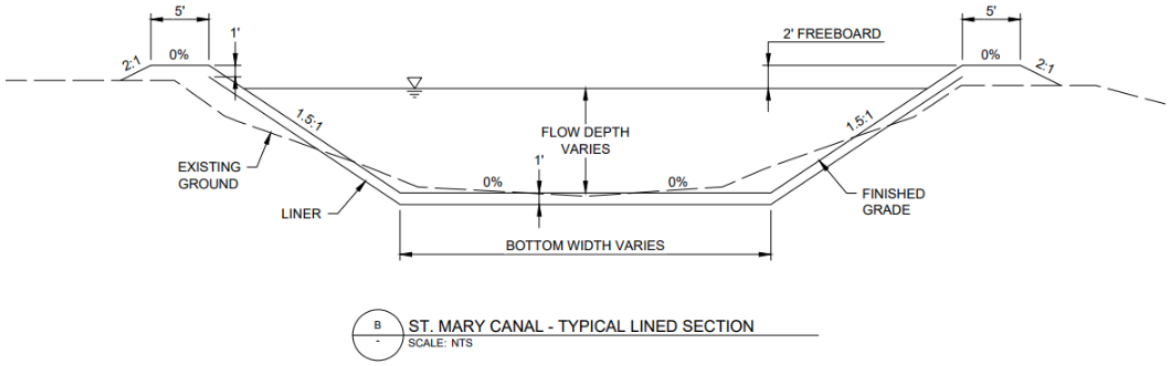

Figure 4-2. Proposed Typical Section to the Canal with Lining

Siphon Modification

Siphon modification would improve the Kennedy Creek Crossing Siphon by adding a new additional RBC adjacent to the existing siphon, leaving the siphon in place. The existing siphon would be evaluated and rehabbed, which may include coating, slip lines, or patching. The St.

Mary and Halls Coulee Siphons will not be included due to the emergency reconstruction that is occurring, which is planned to be completed in 2026.

Drop Structure Replacement

Drop Structures are concrete chutes and plunge pools that exist along the St. Mary Canal System to dissipate the hydraulic energy associated with the elevation drop between the St. Mary River to the North Fork Milk River. Drop Structures 2 and 5 have been replaced recently [7] and therefore would not be included in Alternative 2. Drop Structures 1, 3, and 4 would be reconstructed with a new concrete conveyance structure adjacent to each of the existing structures. Drop Structure 1 would be constructed approximately 150 feet northeast of the existing structure, Drop Structure 3 would be constructed approximately 70 feet north of the existing structure, and Drop Structure 4 would be constructed approximately 80 feet northeast of the existing structure. The St. Mary Canal System alignment would be modified to accommodate the inlets and outlets of the new structures. Existing characteristics of Drop Structures 1, 3, and 4 are summarized in Table 4-3. Remanent and removed materials would be placed within a designated disposal area. Any required erosion and sediment control needs would follow USACE BMPs outlined in Alternative 2 – Lining and Reshaping.

Table 4-3. Dimensions of the St. Mary Canal System Drop Structures to be Replaced

Feature	Length (ft.)	Vertical Drop (ft.)
Drop Structure 1	215	36.5
Drop Structure 3	140	27.8
Drop Structure 4	340	67.0

Slope Stability (Slide Mitigation)

Slope stability, or slide mitigation, refers to the areas along the St. Mary Canal System that are at risk of slope failure due to poorly consolidated glacial sediment, over-steepened slopes and banks, and fluctuations in groundwater conditions due to canal operations and precipitation. Locations between the St. Mary Siphon and Drop Structure 1 have been identified for slide mitigation; however, additional locations could be identified during final design. Three potential methods were considered to address slope stability and mitigate slides:

- Soil Injection Stabilization: A combination of concrete and other compounds would be injected into the slide area to stabilize the slope.
- Buried Conveyance: The canal would be buried in a box culvert (or similar structure) for the length of the slide area.
- Earthwork Mitigation: All slide areas would be stabilized via earth-moving techniques.

[7] See also Chapter 1, for additional information on the emergency repairs completed for Drop Structures 2 and 5.

Based on preliminary geotechnical analysis, the appropriate mitigation method at each slide area was determined to be earthwork mitigation. The general process for addressing the slides with earthwork mitigation would include:

1. Removing weight off the top of the slide areas, to the extent possible, by flattening the exposed slopes.

2. Relocating excavated material, placing and compacting it on the downhill side of the canal, and adding weight to the base of the slide area.

3. Increasing the soil strength, which is accomplished primarily by reducing the amount of water held in the soils within the slide area, reducing the weight driving the landslide and pore pressure.

Excess materials removed from slide areas would be used as fill material along other areas of the St. Mary Canal System. Additional information on each of the slide areas to be mitigated as part of Alternative 2 is shown in Table 4-4. Slide areas are presented in order from west to east along the canal. Some slide areas extend beyond the current canal ROW and therefore would require temporary ROW easements to complete mitigation activities. Additional earth work, vegetation removal, and tree removal would be included in this work when necessary for construction activities and access.

Table 4-4. Slide Areas

Slide Name	Slide Area (Acre)	Earthwork (Cubic Yards)
DeWolfe Ranch	5.55	92,338.42 (cut)
DeWolfe Bridge	5.80	11,440.88 (cut)
Mid-Section 22	4.60	29,577.44 (cut)
North Slope 700	1.91	3,549.84 (cut)
East Section 22	10.11	84,036.03 (cut)
Grizzly Slide	2.40	2,720.96 (cut)
New Slide West of Big Cut	1.39	TBD
Big Cut	6.88	49,220.09 (cut)
4th of July	4.36	0.00
Gravel Road Bridge	0.64	5,730.44 (cut)
Martin Slide	2.28	6,277.89 (cut)
Pipeline Slide	0.68	4,377.65 (cut)
New Slide	0.43	267 (cut)
Total	**47.03**	**--**

Operation and Maintenance Road Improvements

Existing O&M roads along the St. Mary Canal System are generally unmaintained dirt access roads with varying widths, typically 10 to 12 feet, that run adjacent to the canal. The St. Mary

Canal System is in a remote, rural area, except for the first 7 miles of the canal downstream of the St. Mary Diversion, which generally parallels Highway 89. Existing established highways and county roads that cross the St. Mary Canal System to allow access are extremely limited. As a result, access for much of the St. Mary Canal System is limited to the existing O&M roads and require traveling for long distances along the O&M roads. The existing maintenance roads would require improvement to facilitate construction of all other measures. The post-construction condition of the maintenance road would be a 12-foot-wide, all-weather access road with 6 inches of compacted gravel surfacing on the north/east side of the St. Mary Canal System. The total length of the post-construction O&M road along the St. Mary Canal System is 32.7 miles and would be completed in conjunction with the construction of the other modernization measures (Drop Structures, Kennedy Creek siphon, slide mitigation, lining and reshaping of the Canal). Vegetation removal and tree trimming would likely be required to complete improvements (see Appendix D3).

Wasteways, Spillways, and Drains

Wasteways, spillways, and drains along the St. Mary Canal System serve to facilitate the release or discharge of excess water from the canal. Drains along the St. Mary Canal System are used to release water from the canal during dewater and maintenance. For example, in the event of a failure along the St. Mary Canal System, it is critical to remove the water from the canal in an expedited fashion to work on repairing the St. Mary Canal System as soon as possible. Wasteways and drains can be used to remove excess water from the canal after a storm event discharges water into the canal. Two wasteways, the Kennedy Creek and Hall Coulee Wasteways, would be replaced with improved structures (Table 4-5). Gate configurations (automation, etc.) would be evaluated for the new structures. Grass spillways are similarly used to allow excess water to leave the canal in the identified spillway locations where the canal may overtop at vegetated sections of its alignment. Spillways would be replaced or constructed as noted in Table 4-5. The existing drains are old and deteriorating and not able to convey the volume of drainage needed. The existing drains would be replaced with new side channel spillway structures (Table 4-6). Additional details on the alternatives developed for these drains is available in Appendix D3. Remanent and removed materials would be placed within a designated disposal area. Replacement of wasteways, spillways, and drains would occur during the canal reshaping and lining as these components are integral to the overall canal prism and system.

Table 4-5. St. Mary Canal System Wasteways

Name	Structure Description	Proposed Replacement
Kennedy Creek Wasteway (Sta 279+45)	Cast-in-place concrete structure with two radial gates (Wasteway is not operational)	In kind
Halls Coulee Wasteway (Sta 888+34)	Cast-in-place concrete structure with three slide gates and baffled iron spillway (Wasteway is not operational)	In kind

Table 4-6. St. Mary Canal System Spillways

Name	Structure Description	Proposed Replacement
New Spillway 1 (Sta 130+45)	N/A	New side channel spillway
Grassed Spillway 1 (Sta 275+45)	Natural grass overflow spillway, unknown capacity	New side channel spillway upstream of Kennedy Creek Siphon
Grassed Spillway 2 (Sta 396+85)	Grass overflow spillway, unknown capacity	Leave as-is
Grassed Spillway 3 (Sta 896+50)	Grass overflow spillway, unknown capacity	New side channel spillway upstream of Halls Coulee Siphon inlet
New Spillway 2 (Sta 1045+55)	N/A	New side channel spillway
Grassed Spillway 4 (Sta 1152+00)	Grass overflow spillway, unknown capacity	New side channel spillway
Grassed Spillway 5 (Sta 1210+65)	Grass overflow spillway, unknown capacity	New side channel spillway
New Spillway 3 (Sta 1302+30)	N/A	New side channel spillway

Table 4-7. St. Mary Canal System Drains (Turnouts)

Name[1]	Structure Description	Proposed Replacement
Drain 1 (Sta 265+25)	Pipe with slide gate inlet, unknown capacity	Concrete inlet structures with slide gates, pipes, and concrete outlet structures designed to function similar to existing drains.
Drain 2 (Sta 452+55)	Pipe with slide gate inlet, unknown capacity	Concrete inlet structures with slide gates, pipes, and concrete outlet structures designed to function similar to existing drains.
Drain 3 (Sta 555+00)	Pipe with slide gate inlet, unknown capacity	Concrete inlet structures with slide gates, pipes, and concrete outlet structures designed to function similar to existing drains.
Drain 4 (Sta 685+80)	Pipe with slide gate inlet, unknown capacity	Concrete inlet structures with slide gates, pipes, and concrete outlet structures designed to function similar to existing drains.
Drain 5 (Sta 859+31.85)	Pipe with slide gate inlet, unknown capacity	Concrete inlet structures with slide gates, pipes, and concrete outlet structures designed to function similar to existing drains.
Drain 6 (Sta 890+00)	Pipe with slide gate inlet, unknown capacity	Concrete inlet structures with slide gates, pipes, and concrete outlet structures designed to function similar to existing drains.
Drain 7 (Sta 1026+00)	Pipe with slide gate inlet, unknown capacity	Concrete inlet structures with slide gates, pipes, and concrete outlet structures designed to function similar to existing drains.

Underdrains (Culverts)

Underdrains, or culverts, convey natural runoff under the canal, prevent the capture and diversion of stormwater and sediment in the canal, and allow runoff to follow the natural

drainage course (preserving ecological function). The underdrains are located at major natural drainages to convey surface drainage and runoff under the canal. The St. Mary Canal System includes seven major underdrain structures. All major underdrains would be replaced and have their capacity expanded to handle a 25-year event (see Table 4-8). Replacements would be constructed adjacent to existing structures. Flows from these drainages and creeks would flow through the existing structure until construction of the new structure is complete, at which time flows would be diverted through the newly constructed structure. Replacement of underdrains would occur during the canal reshaping and lining because these components are integral to the overall canal prism and system.

Remanent and removed materials would be placed within a designated disposal area.

Table 4-8. St. Mary Canal System Underdrains

Feature	Existing Station	Existing Structure Description	Existing Structure Length (ft.)	Proposed Sizing (Measure 2)	Proposed Sizing (Measure 3)	Replacement Length (ft)
Powell Creek Underdrain	334+00	Two 66-inch reinforced concrete pipes (RCP)	Unknown	22 x 66” RCP	2 x 78” RCP	2 x 150
Cow Creek Underdrain	802+50	54 x 66-inch RCP	180	54” x 66” RCB	72” x 72” RCB	180
Underdrain	984+00	30-inch RCP	143	30” RCP	2 x 36” RCP	2 x 144
Underdrain	1056+00	30-inch RCP	140	30” RCP	42” RCP	140
Underdrain	1100+00	30-inch RCP	168	30” RCP	36” RCP	168
Underdrain	1137+50	30-inch RCP	143	30” RCP	36” RCP	144
Underdrain	1202+75	30-inch RCP	157	30” RCP	30” RCP	158

During final design, each underdrain location will be reviewed to determine if the replacement culverts would benefit from countersinking. The USACE Omaha regional office states that, in Montana, culvert stream crossings in jurisdictional streams and a stable stream bed shall be installed with the culvert invert set below the natural stream channel flow line according to Table 4-9. This does not apply in instances where lowering the culvert invert would allow a headcut to migrate upstream of the project into an unaffected stream reach or result in lowering the elevation of the stream reach (USACE 2021).

Table 4-9. Culvert Countersink Depth

Culvert Type	Drainage Area	Minimum Distance Culvert Invert Shall Be Lowered Below Stream Flow Line
All culvert types	<100 acres	Not required
Pipe diameter <8.0 ft	100 to 640 acres	1/2-ft
Pipe Diameter <8.0 ft	>640 acres	1-ft
Pipe Diameter >8.0 ft	All drainage sizes	20% of pipe diameter
Box culvert	All drainage sizes	1-ft

Source: USACE 2021

4.4.3 Alternative 3 – Canal Modernization, Reshape (Future with Federal Investment)

Under Alternative 3, federal funding through P.L. 83-566 would be available and the St. Mary Canal System would be modernized. The measures that would be included with Alternative 3 are the same measures as Alternative 2 except for the lining. Figure 4-1 and Figure 4-2 demonstrate the difference of the earthen or lined canal. The total footprint of impacts would be the same as Alternative 2, both temporary and permanent impacts would total 702.21 acres.

Alternative 3 would meet the purpose and need and would contribute to the Federal Objectives and Guiding Principles by:

- **Improving water delivery reliability to water users** – Modernizing the St. Mary Canal System would improve operational irrigation and municipal water delivery for beneficiaries served by the Milk River Project. Alternatives 2 and 3 would improve water availability and drought resilience for users through the MRJBOC area.
- **Improving water conservation** – Modernizing the canal would reduce water loss from seepage and evaporation.
- **Reducing risk of infrastructure failure** – Drop Structure replacement, stabilization of landslide areas, and siphon modification would reduce the risk of infrastructure failure associated with the age of the features in the current system that are required to deliver water through the canal.

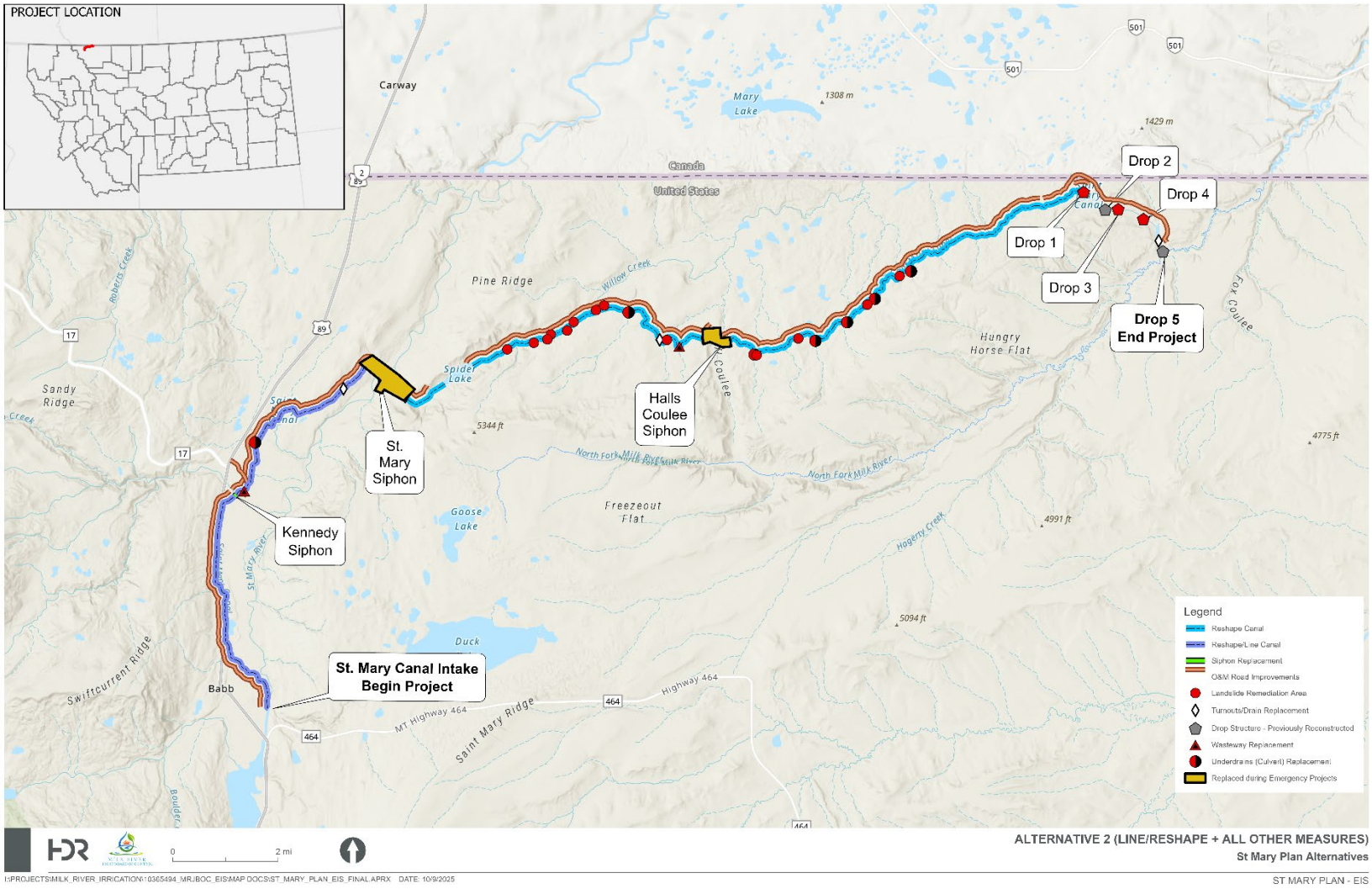

Figure 4-3. Alternative 2

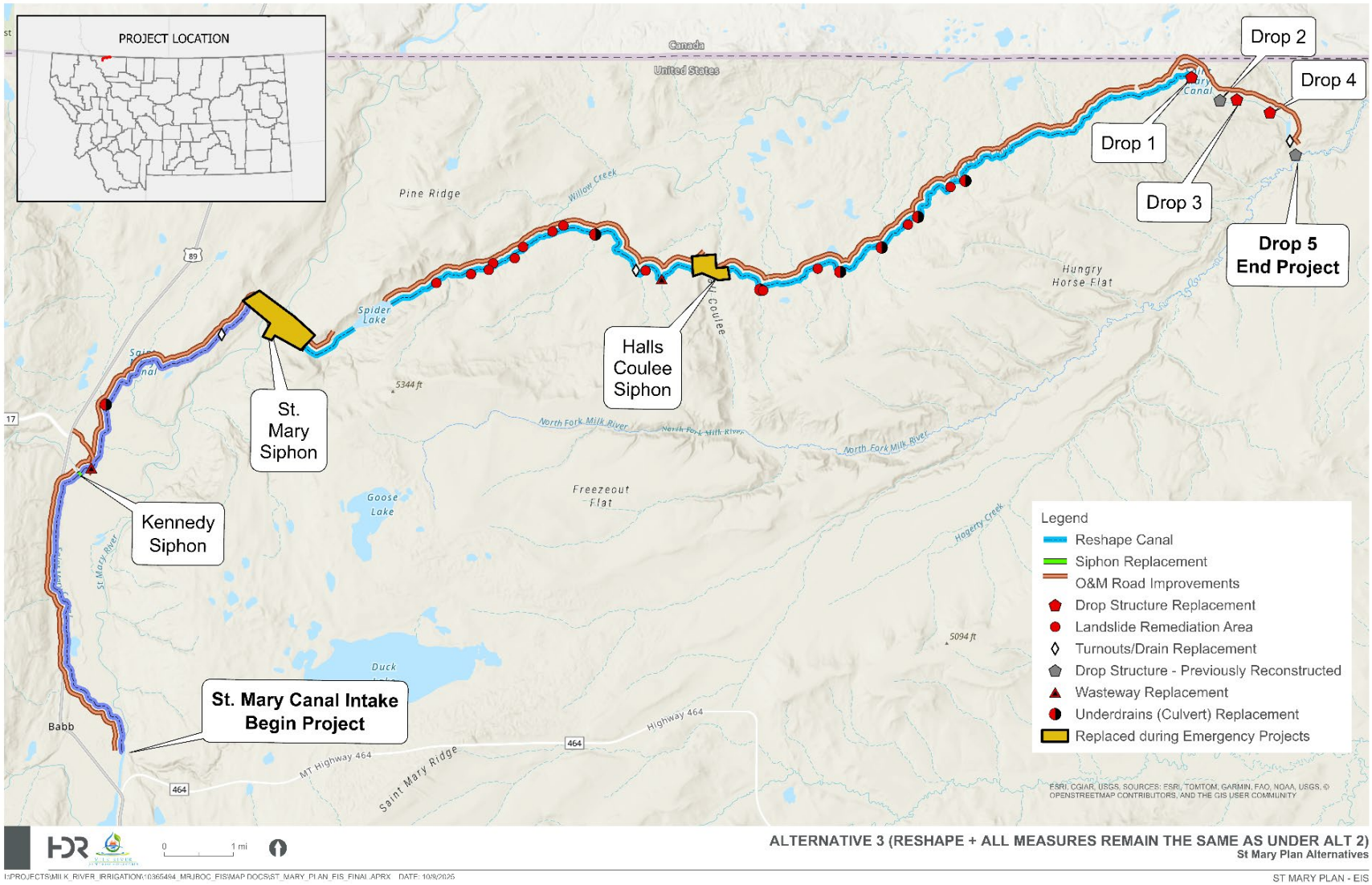

Figure 4-4. Alternative 3

4.5 Summary and Comparison of Alternatives

Table 4-10 compares Alternative 1, No Action (FWOFI), and Alternatives 2 and 3 (Future with Federal Investment [FWFI]). The table summarizes measures addressed as well as environmental, social, cultural, and economic considerations.

Table 4-10. Summary and Comparison of Alternatives

Item or Concern	Alternative 1 No Action (FWOFI) No Canal modernization measures implemented.	Alternative 2 (FWFI) Canal modernization measures implemented (with lining).	Alternative 3 (FWFI) Canal modernization measures implemented (without lining).
Alternative Plans	-	-	-
Locally Preferred	-	-	X
NEE	-	-	X
Environmentally Preferred	-	-	X
Socially Preferred	-	-	X
PR&G Guiding Principles	-	-	-
Healthy and Resilient Ecosystems	-	X	X
Sustainable Economic Development	-	X	X
Floodplains	-	X	X
Public Safety	-	X	X
Watershed Approach	-	X	X
Provisioning Services	-	-	-
Irrigation and Municipal Water	Irrigation and municipal water would continue to be unreliable.	Modernization measures would help provide more secure and reliable irrigation and municipal water.	Modernization measures would help provide more secure and reliable irrigation and municipal water.

Item or Concern	Alternative 1 No Action (FWOFI) No Canal modernization measures implemented.	Alternative 2 (FWFI) Canal modernization measures implemented (with lining).	Alternative 3 (FWFI) Canal modernization measures implemented (without lining).
Fisheries	Potential negative impact on fish species in the North Fork Milk River and Milk River due to availability of water and ability of the system to support fish species.	The canal is not suitable habitat for fish species and is not managed as fish habitat. Water delivered into the North Fork Milk River, Milk River and Fresno Reservoir would improve long-term fish habitat and habitat quality for many species. The diverted water from the St. Mary River would have a negligible to minor effect on the fisheries within the St. Mary River, since the discharge is within this range and has a reliable source from Glacier National Park. Minor to moderate permanent impacts to fisheries in streams adjacent to the canal may occur as the lining may prevent some seepage from reaching these resources. Temporary impacts to water quality may have minor impacts on fish species within the study area.	The canal is not suitable habitat for fish species and is not managed as fish habitat. Water delivered into the North Fork Milk River, Milk River and Fresno Reservoir would improve long-term fish habitat and habitat quality for many species. The diverted water from the St. Mary River would have a negligible to minor effect on the fisheries within the St. Mary River, since the discharge is within this range and has a reliable source from Glacier National Park. Temporary impacts to water quality may have minor impacts on fish species within the study area.
Regulating Services	-	-	-
Water Quality	No effect. The existing surface water quality would remain unchanged.	The measures would reduce the ability for sediment in the bed and banks of the canal to be suspended. The liner proposed for the first 9 miles would have additional benefit to stabilizing the canal, reducing the suspended	The measures would reduce the ability for sediment in the bed and banks of the canal to be suspended. Additional suspended solids could occur compared to Alternative 2 due to first 9 miles not being lined.

Item or Concern	Alternative 1 No Action (FWOFI) No Canal modernization measures implemented.	Alternative 2 (FWFI) Canal modernization measures implemented (with lining).	Alternative 3 (FWFI) Canal modernization measures implemented (without lining).
		solids compared to Alternative 3. Additional water conveyed through the canal and into the Milk River would dilute concentrations of some parameters (i.e. suspended solids) and benefit water quality. Flow reduction within the St. Mary River could change the concentrations of monitored water quality parameters, anticipated to be a minor to moderate effect.	Additional water conveyed through the canal and into the Milk River would dilute concentrations of some parameters (i.e. suspended solids) and benefit water quality. Flow reduction within the St. Mary River could change the concentrations of monitored water quality parameters, anticipated to be a minor to moderate effect.
Cultural Services	-	-	-
Historic Properties and Cultural Resources	No effect. Resources would remain unchanged.	Adverse Effect. Development of an MOA and Treatment Plan.	Adverse Effect. Development of a MOA and Treatment Plan.
Recreation	Reduced water levels within Fresno Reservoir.	Minor beneficial effect by increasing the water delivery to Fresno Reservoir and Nelson Reservoir downstream.	Minor beneficial effect by increasing the water delivery to Fresno Reservoir and Nelson Reservoir downstream.
National Economic Efficiency Analysis	-	-	-
Federal Funds[1]	$0	$147,871,104	$113,849,112
Local only or Matching P.L. 83-566	$0	$59,714,606	$40,464,463
Total	$0	$207,585,710	$154,313,575
Average Annual Cost[2] Installation			

Item or Concern	Alternative 1 No Action (FWOFI) No Canal modernization measures implemented.	Alternative 2 (FWFI) Canal modernization measures implemented (with lining).	Alternative 3 (FWFI) Canal modernization measures implemented (without lining).
Other	$0	$5,506,280	$4,303,472
Total	$0	$2,621,458	$2,004,366
	$0	$8,127,738	$6,307,838
Annual Benefits	$0	$10,266,408	$9,771,193
Annual Costs[2]	$0	$8,127,738	$6,307,838
Annual Net Benefits	$0	$2,138,670	$3,463,355
Regional Economic Impacts	-	-	-
Annual Local Jobs during Construction	0	200	178
Annual Jobs from Recreation	Not Applicable	Not Applicable	Not Applicable
Annual Jobs from Agriculture (including direct, indirect, and induced)	0	Negligible	Negligible
Beneficial Effects Annualized (Millions, 2020$)	-	-	-
Region	$0	Negligible effects related to construction employment/income, but not estimated	Negligible effects related to construction employment/income, but not estimated
Rest of Nation	$0	Not Applicable	Not Applicable
Adverse Effects Annualized (Millions, 2020$)	-	-	-
Region	Not Applicable	Not Applicable	Not Applicable
Rest of Nation	Not Applicable	Not Applicable	Not Applicable

[1] Federal funding for construction costs would be shared between NRCS (48.96%) and Reclamation (26.04%).
[2] Does not include escalation to the midpoint of construction. Average annual costs are computed as an annualization of total present value costs over a standard 100-year period and with a 3.25% discount rate.

5 Environmental Consequences

This chapter describes the anticipated environmental consequences of the No-Action Alternative and Action Alternatives. Within this chapter, each resource identified in Chapter 3 is evaluated to determine the effects of the No-Action Alternative (FWOFI) and the two Action Alternatives (FWFI) described in Chapter 4. Impacts on each resource are categorized by intensity, duration, and context. Table 5-1 defines the terms used to identify intensities and durations throughout the chapter.

The permanent and temporary impact areas are based on preliminary design. These areas remain in the calculations for efficiency and provide a more conservative impact analysis.

Table 5-1. Duration and Intensity Threshold Descriptions

Impact Categorization	Description
Impact Severity	-
Negligible	Impacts on the resource would be difficult to detect. If the impact(s) on the resource/environment were able to be detected, the changes would have little to no noticeable difference.
Minor	Impacts on the resource or environment would be small but detectable.
Moderate	Impacts on the resource or environment would be detectable and apparent.
Major	Impacts on the resource or environment would be detectable and substantial.
Impact Duration	-
Temporary	Impacts would only occur over several days or months. Conditions would return to pre-construction state.
Permanent	Resources would not return to pre-construction state. Impacts would change the resource or environment permanently.

5.1 Land Use

5.1.1 No-Action Alternative (Alternative 1 – FWOFI)

The No-Action Alternative would not affect land ownership within the project area adjacent to the St. Mary Canal System. The St. Mary Canal System would continue to be managed by Reclamation and adjacent land would be Tribally and privately owned. The No-Action Alternative would have no effect on existing USFWS easements.

The No-Action Alternative could lead to a gradual shift in land uses within the service area. Due to the lack of reliable water supply resulting from the St. Mary Canal System's deteriorating infrastructure, irrigated cropland would transition to dryland crop farming or rangeland. Reclamation's Fresno Dam Safety of Dams: Irrigation Benefits Technical Report (2019) details the national economic benefit valuation of irrigation-use surface water provided by the Milk River Project. It reports that 1.75 AF per acre is an excellent proxy for the project irrigated lands within the service area. Applying this proxy, 1 fewer irrigated acre could result from each 1.75 AF reduction in water delivery. The St. Mary Canal System's capacity has been decreased by approximately 21,538 AF annually, which equals 12,307 acres of irrigated cropland (see Appendix D5). The continued effect of the loss of irrigated cropland in the service area would be moderate to major and permanent.

Municipalities within the service area may have to limit future development; however, that risk is minimal as the municipalities currently use an average of about 2,600 AF of their contracted 4,600 AF, and water availability is not currently limiting the development of municipal areas within the service area (Reclamation 2012). Further, a negligible portion of water appropriated from the St. Mary River is consumed by municipalities compared to consumption for irrigation. Impacts of the No-Action Alternative on municipalities would be negligible.

Under the No-Action Alternative, recreational activities, such as fishing, camping, hunting, and wildlife viewing along the St. Mary Canal System and Milk River downstream of the project, would not change. The decrease in water quantity and the overall unreliability of the St. Mary Canal System during potential system failures would affect recreation opportunities for short periods or permanently if a failure were to occur.

5.1.2 Action Alternative (Alternative 2 – Canal Modernization, Line/Reshape)

Lining and Reshaping

Alternative 2 would result in temporary and permanent disturbance to agricultural lands, waters and wetlands, forested land, and developed land within the project area, as listed in Table 5-2.

Table 5-2. Land Disturbance for Alternative 2 by Land Use Type (NLCD 2021)

Land Use Cover Type	Temporary Disturbance in Project Area (acres)	Permanent Disturbance in Project Area (acres)	Total Disturbance in Project Area (acres)
Agriculture	-	-	-
Cultivated Crops	0.84	0.85	1.69
Pasture/Hay	3.70	2.59	6.29
Grassland/Herbaceous	98.62	62.02	160.64
Shrub/Scrub	153.56	164.91	318.47
Barren Land (Rock/Sand/Clay)	0	0	0

Land Use Cover Type	Temporary Disturbance in Project Area (acres)	Permanent Disturbance in Project Area (acres)	Total Disturbance in Project Area (acres)
Developed	23.20	26.17	49.37
Forested	24.84	30.30	55.14
Water/Wetlands	52.62	57.99	110.61
Total	357.38	344.83	702.21

Under this action alternative, the first 9 miles of the canal would be reshaped, and a geosynthetic liner would be placed in the bottom width and side slopes. The canal would be reshaped (without liner) for approximately 20 miles from the St. Mary Diversion to Drop Structure 5 (see Chapter 4, Alternatives). Alternative 2 would support the existing and future land uses planned within irrigation districts and municipalities that receive the water. Alternative 2 is anticipated to provide more reliable delivery of the allocated water amount, which would support existing agricultural land uses and reduce the frequency of irrigation deficiency within the service area. Overall, the impact of Alternative 2 on the service area would be moderate to major, beneficial, and permanent.

The reshaping would create a more defined boundary than current conditions between the St. Mary Canal System and adjacent land uses, because the banks of the canal have deteriorated. This alternative would have small areas of impact on the agricultural land use designation for the additional areas that would be acquired for the St. Mary Canal System ROW. Reclamation would continue to manage the existing ROW and these newly acquired areas. Constructing Alternative 2 would require new permanent ROW and temporary easements, as shown in Table 5-3. The permanent ROW, approximately 7.56 acres, would be converted and incorporated into the existing ROW for the St. Mary Canal System (Table 5-3 and Table 5-4). Temporary easement areas would be reseeded and not be converted from current ownership. Coordination with landowners would occur during final design for both areas. Trust land would require coordination with the BIA realty office during further design of the Preferred Alternative. The land conversion for permanent ROW would be required to follow the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

USFWS easements are present within the project area. Coordination occurred with the Benton Lake USFWS Wetland Management District to confirm the easement boundaries discussed in Section 3.1.1. The current design of Alternative 2 avoids the identified easements. Coordination would be required with the Benton Lake USFWS Wetland Management District if an easement is encroached upon during final design. Typically, a Special Use Permit is required for permanent and temporary easements within a wetland or grassland easement. Coordination would occur to complete the permit process.

Table 5-3. New Right-Of-Way Needs for Alternative 2 by Land Ownership

Land Ownership	Permanent ROW	Temporary Impacts
Federal- Reclamation	0.81	13.79
Tribal Trust Land- Blackfeet Reservation	1.36	4.36
Private	5.38	27.38
State or Local Government	0.00	0.00
Total	7.56	45.53

Seepage from the St. Mary Canal System would be reduced within the 9-mile segment that would be lined. The reduced seepage impacts are anticipated to extend up to 0.5 mile from the St. Mary Canal System (see Appendix D2). In the 20-mile segment that would only be reshaped, seepage would be similar to existing conditions. The reduction in seepage would not result in a change of land use; however, it may result in a decrease of forage production in areas where seepage from the canal currently augments baseline water availability. Therefore, Alternative 2 is expected to have a localized impact on forage production and grazing land that is concentrated in riparian areas where seepage from the canal augments the water supply. Because the water from the St. Mary River was never intended to be used to irrigate lands by seepage from the canal, the magnitude of impact on the adjacent land use is considered minor. The duration of the impact would be permanent.

Alternative 2 would provide a reliable delivery of water to the Fresno and Nelson Reservoirs, as well as maintain water within the St. Mary Canal System. This would maintain recreational opportunities within the area and have a minor beneficial effect. The campgrounds adjacent to the project area are open primarily during the summer, and construction would also occur during this time. These areas may experience temporary minor to moderate impacts during construction due to increased traffic, noise, and dust.

Overall, the impacts on land use in the project area from lining and reshaping the canal under Alternative 2 would be minor to moderate in intensity and temporary and permanent in duration.

Siphon Modification

A new, additional RCB would be installed adjacent to the existing Kennedy Creek siphon, and the existing siphon would remain in place and rehabbed (see Appendix E3). See the Lining and Reshaping section for the discussion on ROW and temporary easement areas. Kennedy Creek Siphon modification would improve the St. Mary Canal System's water delivery for agricultural production in Blaine, Hill, Phillips, and Valley Counties and have a permanent beneficial impact in the service area. Land use within the project area is not anticipated to be permanently impacted by the siphon modification.

Drop Structure Replacement

The effects on land use from Drop Structure replacement would be similar to the effects from lining and reshaping the St. Mary Canal System. Drop Structures would be replaced adjacent to

the current structures, resulting in the need for new ROW. ROW acquisition would convert small areas from their current use into land used for the conveyance of irrigation water, having a minor, permanent effect on existing or planned future land use for those areas (see Appendix C2).

Slope Stability (Slide Mitigation)

Impacts on land use related to slope stability are anticipated to be similar to those described above in the Lining and Reshaping and Drop Structure Replacement sections. Areas with slope stability improvements may require land acquisition for additional stabilization outside existing St. Mary Canal System ROW (see Appendix C2). These areas would be smaller, and the land use would be converted from agricultural to St. Mary Canal System ROW. This would have a minor, permanent effect on land use.

O&M Road Improvements

Impacts on land use are anticipated to be similar to those listed in the Lining and Reshaping section. Portions of the O&M road along the canal are located within an existing Reclamation ROW easement (300-foot corridor) and would not require additional temporary or permanent ROW. Minor, permanent impacts on land use are anticipated to occur. In total, approximately 32.7 miles (172,025 feet) of O&M roadway would be improved, as shown in Table 5-4.

Table 5-4. O&M Road Improvements (HDR 2022)

Reach Description	Length of O&M Road Improvements (ft)
St. Mary Diversion to Kennedy Siphon	24,846
Kennedy Siphon to St. Mary Siphon	22,279
St. Mary Siphon to Halls Coulee Siphon	41,428
Halls Coulee Siphon Emigrant Gap Road	46,471
Emigrant Gap Road to Drop 5	17,611
Drop 5 to Fox Ranch Road	4,610
Spider Lake Alternate Route	7,182
Kennedy Wasteway Access	2,984
Kennedy Siphon Access	1,140
St. Mary Diversion Access	2,283
Drop 1 Access	1,191
Total	172,025

Wasteways, Spillways, and Drains

Wasteways, spillways, and drains would have no effect on land use. Construction of the wasteways, spillways, and drains would occur within the existing St. Mary Canal System ROW.

Underdrains (Culverts)

Underdrains would have no effect on land use. Underdrain construction would occur within the existing St. Mary Canal System ROW.

5.1.3 Action Alternative (Alternative 3 – Canal Modernization, Reshape)

Alternative 3's impacts on land use would be similar to those impacts under Alternative 2. However, under Alternative 3, the first 9-mile segment of the St. Mary Canal System would not be lined and would only be reshaped. Vegetation adjacent to the St. Mary Canal System would continue to receive seepage, more than Alternative 2 and slightly more than Alternative 1, and no overall change in vegetation productivity would occur that would alter wildlife or livestock grazing activity. The additional seepage may have beneficial impacts on wetlands adjacent to the St. Mary Canal System because it would continue to feed and maintain many of the existing wetlands, similar to the No-Action Alternative.

Alternative 3 would have less efficient water delivery than Alternative 2 due to seepage. The alternative is anticipated to deliver the allocated water to the irrigation districts, but the St. Mary Canal System would be less efficient in delivering this water quantity. This may affect land use within the irrigation districts and municipalities over a longer period as the St. Mary Canal System ages.

Impacts on easements and ROW acquisition would be the same as for Alternative 2. In summary, the impacts of Alternative 3 on land use in the project area would be minor to moderate in intensity and temporary and permanent. Impacts on agricultural land uses in the service area would be moderate to major, permanent, and beneficial.

5.2 Soils

5.2.1 No-Action Alternative (Alternative 1 – FWOFI)

Soils

Without improvements, soil erosion would continue along the St. Mary Canal System, including along the main conveyance route, Kennedy Creek Siphon area, and Drop Structures. Reclamation would have increased operation and maintenance under this alternative. Additionally, emergency construction would be required if the system fails, which may lead to compacted and further disturbed soils due to earth work and the presence of large machinery. Therefore, the No-Action Alternative would have minor, permanent impacts on soils within the project area.

Landslides

The No-Action Alternative would not address concerns with slope stability that have been identified in slide mitigation areas along the St. Mary Canal System. By not addressing these areas, landslides could cause issues with water delivery to irrigation districts and municipalities by permanently blocking the St. Mary Canal System during slope failures. Therefore, the No-Action Alternative would have major, permanent effects by not addressing the potential system failure due to landslides.

5.2.2 Action Alternative (Alternative 2 – Canal Modernization, Line/Reshape)

Lining and Reshaping

Soils

Lining and reshaping would require approximately 284,525 CY of fill. This is the equivalent of approximately 117 Olympic-sized swimming pools (which each hold 490,000 gallons of water) worth of fill. Impacts on fill areas would be permanent and minor because the soils were previously disturbed during the original construction of the St. Mary Canal System. Alternative 2 would require less cut/fill activity than Alternative 3. Fill material for the canal would be sourced from nearby areas and slopes, as well as excess excavated materials from landslide areas. Any additional material needed would be locally sourced, non-engineered material. The anticipated footprint of permanent impacts associated with improvements would be approximately 344.83 acres (see Table 5-2).

Improvements to the slope under this alternative would improve canal wall erosion rates, decreasing the slope and creating a standard 1.5:1 ratio. Lining of the first approximately 9 miles of the canal with a geosynthetic liner is anticipated to reduce erosion compared to Alternatives 1 and 3. This would be a minor beneficial impact overall to the St. Mary Canal System. This liner may require repair over time when wildlife or other animals create holes.

Heavy machinery used during construction would have minor to moderate temporary impacts on soils. The total temporary impact footprint would be approximately 357.38 acres with the current design. This may include areas of compaction and other disturbances, such as grading. During final design, additional geotechnical studies and analyses would be completed to design the project in accordance with the soils present at each location to minimize these impacts.

Alternative 2 would disturb more than 1 acre and would require a National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity from the Environmental Protection Agency (EPA) (Montana DEQ 2023). The permit would require the inclusion of a Stormwater Pollution Prevention Plan (SWPPP) and BMPs for erosion prevention during construction. This would include seeding requirements to reduce erosion and effects on topsoil and the overall soil profile in areas that have been disturbed.

Landslides

Improvements to the St. Mary Canal System's conveyance would overall be beneficial to soils within and surrounding the canal by increasing stability in documented landslide areas and correcting steep slopes to prevent future slides. Soil disturbance may create some minor areas of instability; these areas would need to be monitored for safety reasons prior to and during construction activities. Following construction, the canal would have improved slopes, as shown in the cross-section figure (Figure 4-1). Excess materials removed from slide areas would be reused throughout the project area in locations requiring fill materials, when possible.

Siphon Modification

Soils

Siphon modification would require ground disturbance adjacent to the Kennedy Creek Siphon. The total permanent impact on soils with the current design is anticipated to be approximately 3.25 acres. Temporary impacts of these improvements would have an anticipated footprint of approximately 12.30 acres. Alternative 2 includes leaving the existing siphon in place.

This option would have a minor, permanent impact on the soil profile in the vicinity of the siphon because earth work would be minimized, and minimal area would be disturbed.

Siphon modification may cause localized, minor, temporary impacts on soil stability. Kennedy Creek Siphon is not located in an area along the canal with previously documented slope stability issues; however, during final design, additional geotechnical studies and analyses would be completed to design the project in accordance with the soils present to minimize bank slope stability issues.

Drop Structure Replacement

Soils

Impacts on soils associated with Drop Structure replacement would be similar to those described in Alternative 2, Lining and Reshaping. Areas disturbed by construction would be reclaimed following construction activities. Soil impacts related to Drop Structure replacement are anticipated to have a combined permanent impact of approximately 4.6 acres (for improvements to Drop Structures 1, 3, and 4) and a combined temporary impact of approximately 7.3 acres for the three Drop Structure locations.

Landslides

Drop Structure Replacement would have similar impacts and effects on landslides as discussed in Alternative 2, Lining and Reshaping.

Slope Stability (Slide Mitigation)

Soils

Slope stability improvements along the canal would occur due to reshaping to create more optimal slopes. Minor, permanent impacts on soil composition are anticipated as engineered fill from the local area would be used in these locations. Excavation areas are anticipated to be between 30 and 50 feet wide and between 10 and 25 feet deep. Permanent impacts on topsoil and the soil profile are anticipated in cut and fill areas, which were disturbed previously by the original construction of the St. Mary Canal System. Temporary impacts on soils due to the presence of heavy machinery can be expected during construction-related activities, such as cutting and filling.

Landslides

Slope stability improvements would provide permanent solutions to vulnerable landslide areas along the canal by excavating unstable materials and replacing them with engineered fill and structures for stability. While these improvements are anticipated to increase overall stability in slide mitigation areas, changes to the landscape due to earth work and other activities are anticipated.

Lining and reshaping the canal would implement slide mitigation measures at the areas with identified slope stability issues. By addressing these areas, Alternative 2 would result in more reliable water delivery to the service area by reducing the chance of a canal system failure due to landslide caused by slope instability created by canal leakage and the resulting saturated soils. Therefore, the alternative would have beneficial effects by reducing the chance for a potential system failure related to the identified landslide areas. Current design would result in approximately 10 acres of permanent impact and 13 acres of temporary impacts for slide mitigation areas.

O&M Road Improvements

Soils

Permanent impacts are anticipated to occur in areas where the existing roadway would be widened to the 12-foot standard or shifted to match the inlets and outlets of the Drop Structures and the siphon. In these instances, cutting and filling to build the roadway would cause permanent impacts on topsoil and the soil profile. Permanent impacts are anticipated in areas where the O&M road would be realigned and are anticipated to total approximately 6 acres. Temporary impacts due to grading and other construction related activities are anticipated to have a total footprint of approximately 42 acres.

Landslides

O&M road improvements are expected to have both temporary and permanent beneficial impacts on landslide areas. Shifting the roadway to allow for additional stabilization measures to be put in place would improve soil stability. Similar to lining and reshaping, work completed to improve slopes associated with the O&M road would have a minor risk of disturbing previously stable soils. Areas would be monitored following construction to identify if areas become unstable.

Wasteways, Spillways, and Drains

Soils

Wasteways and drain impacts would be similar to those described in Alternative 2, Lining and Reshaping. In addition, improvements to wasteways, spillways, and drains are anticipated to cause permanent, minor to moderate benefits by minimizing the amount of water sitting within or flowing through the soil. In excess, standing or moving water can cause soil shifting and suspension. Areas of soil disturbance associated with these elements are included in the footprint acreage provided in Alternative 2, Lining and Reshaping.

Landslides

Wasteways and drain impacts would be similar to those described in Alternative 2, Lining and Reshaping. As mentioned, these upgrades would improve drainage and water flow within areas that collect water adjacent to the canal, reducing waterlogged soils. Excess water within soils can cause soil instability, including minor to major shifting events. Overall, improvements to wasteways, spillways, and drains along the St. Mary Canal System would improve soil conditions by minimizing the amount of water within soils along the canal, reducing the overall chances of future landslide events.

Underdrains (Culverts)

Soils

Impacts associated with underdrains would be similar to those discussed in Alternative 2, Lining and Reshaping. When possible, areas disturbed by construction would be reclaimed following construction activities. Areas of soil disturbance associated with underdrains (culverts) are included in the footprint acreage provided in Alternative 2, Lining and Reshaping.

Landslides

Impacts associated with underdrains would be similar to those discussed in Alternative 2, Lining and Reshaping.

5.2.3 Action Alternative (Alternative 3 – Canal Modernization, Reshape)

Impacts on soils under Alternative 3 would be similar to Alternative 2, having a minor permanent impact. Alternative 3 would require approximately 39,000 CY more fill than Alternative 2. Soil erosion along the St. Mary Canal System would be likely to improve following reshaping of the canal, which would increase the stability of soils in the vicinity.

5.3 Prime and Unique Farmlands

5.3.1 No-Action Alternative (Alternative 1 – FWOFI)

In the event of a potential system failure in the project area, such as the Drop Structure 5 failure in 2020, impacts due to flooding/washing out of grassland/pasture could occur adjacent to the St. Mary Canal System. In the case of failure and necessary emergency construction, the effects on agricultural lands along the St. Mary Canal System, specifically the identified 3 acres of farmland of statewide importance, would experience moderate temporary impacts (Figure 3-11).

In the service area, lack of reliable delivery of St. Mary River waters would have moderate to major permanent adverse impacts on agricultural lands within the service area, specifically prime and unique farmlands (Figure 3-12). In the case of a potential failure of the St. Mary Canal System, temporary impacts would be dependent on the duration and severity of a water interruption/decreased flow event.

5.3.2 Action Alternative (Alternative 2 – Canal Modernization, Line/Reshape)

Lining and Reshaping

The improvements to the conveyance system would repair leaks within the Blackfeet Reservation and may cause minor, permanent impacts on the identified prime, unique, and statewide importance farmland within the project area. Current design anticipates approximately 1.4 acres of temporary impacts and 0.1 acre of permanent impacts; these areas may change slightly during final design. Due to the relatively small area, these impacts are not anticipated to change the land use of the agricultural areas adjacent to the St. Mary Canal System.

Lining and reshaping the canal would have beneficial impacts on prime, unique, and statewide importance farmlands within the service area. Lining and reshaping would improve water flow through the St. Mary Canal System to the original capacity of 850 cfs, allowing the agricultural lands to use the water for irrigation, including the designated prime, unique, and statewide importance farmland areas. These permanent beneficial impacts would be moderate to major.

Siphon Modification

Kennedy Creek Siphon modification is not anticipated to have direct impacts on prime, unique, and statewide importance farmlands. No areas are present adjacent to the siphon.

The effect on the designated farmlands within the service area would be similar to Alternative 2, Lining and Reshaping.

Drop Structure Replacement

No designated prime, unique, and statewide importance farmland is located within the footprint of the proposed Drop Structure replacements. Therefore, these designated farmlands would not be directly impacted.

The effect on the designated farmlands within the service area would be similar to Alternative 2, Lining and Reshaping.

Slope Stability (Slide Mitigation)

No designated prime, unique, and statewide importance farmland is located within the footprint of the proposed slope stability improvements. Therefore, these designated farmlands would not be directly impacted.

The effect on the designated farmlands within the service area would be similar to Alternative 2, Lining and Reshaping.

O&M Road Improvements

No designated prime, unique, and statewide importance farmland is located within the footprint of the proposed O&M road improvements. Therefore, these designated farmlands would not be directly impacted.

The effect on the designated farmlands within the service area would be similar to Alternative 2, Lining and Reshaping.

Wasteways, Spillways, and Drains

Impacts associated with wasteways, spillways, and drains are included within the impacts discussed in Alternative 2, Lining and Reshaping.

The effect on the designated farmlands within the service area would be similar to Alternative 2, Lining and Reshaping.

Underdrains (Culverts)

Impacts associated with underdrains are included in the impacts discussed in Alternative 2, Lining and Reshaping.

The effect on the designated farmlands within the service area would be similar to Alternative 2, Lining and Reshaping.

5.3.3 Action Alternative (Alternative 3 – Canal Modernization, Reshape)

Impacts on prime, unique, and statewide importance farmland under Alternative 3 would be similar as those described for Alternative 2.

5.4 Water Resources

5.4.1 No-Action Alternative (Alternative 1 – FWOFI)

Under the No-Action Alternative, no improvements would be made. The St. Mary Canal System and associated infrastructure (siphon, culverts, etc.) would continue to operate below the original conveyance capacity, and a higher risk of major failure would still be present and continue as the infrastructure is past its life cycle.

The No-Action Alternative would have no direct impacts on the canal, other waterways, or wetlands within the project area because no improvements would be constructed. Impacts may occur to these features during major failures of the St. Mary Canal System due to the necessary maintenance and construction.

The 2024 Reclamation Basins Study determined irrigation water shortages averaged 77,000 AF per year, which is approximately 37 percent of the total amount of water needed for optimal crop growth (Reclamation 2024). An irrigation depletion shortage is defined as unmet crop need. During the spring, the Milk River Project irrigation districts meet with Reclamation to set water

allotments for the upcoming season. In years where water shortages are anticipated, allotments for all project water users are reduced so that shortages are shared equitably. The St. Mary Canal System's deteriorating infrastructure has resulted in a 250 cfs conveyance capacity loss from the original design. Further, the annual water lost to seepage through the canal was determined to be approximately 17,180 AF (see Appendix D5). Without improvements, the risk of system failure would continue to increase, which would compromise the St. Mary Canal System's ability to deliver St. Mary River water to the beneficiaries. The current shortage of needed irrigation water compounded with the reduced delivery capacity of the St. Mary Canal System affects the agricultural production for the eight irrigation districts. This causes a reduction in productivity of irrigated agricultural lands in the service area, and a reduction in the diversity of crops that the producers can consider planting.

The worst-case scenario would be a complete system failure where water delivery through the St. Mary Canal System would be stopped. This scenario has occurred in 2020 with the failure of Drop Structure 5 and in 2024 with the failure of the St. Mary Siphon, which eliminated the St. Mary River as a water supply source for most of the irrigation season and had severe impacts on irrigated agriculture. During an average year, water diverted from the St. Mary River through St. Mary Canal accounts for 70 percent of average annual irrigation season flows in the Milk River, and as much as 95 percent during extreme drought (Reclamation 2023). This would have a major, permanent effect on the water supply users if the St. Mary Canal System was not reconstructed.

In the project area, water quality under the No-Action Alternative would experience minor adverse effects as bank erosion causes increased sediment in the canal. Impacts on water quality in the downstream service area would be negligible. No impacts on groundwater would occur.

Under the No-Action Alternative, the water quantity diverted would remain below the allotted diversion amount, and the unreliability of the St. Mary Canal System to convey the water supply for beneficial use would increase over time. Adverse permanent impacts in the service area would be moderate to major.

5.4.2 Action Alternative (Alternative 2 – Canal Modernization, Line/Reshape)

Lining and Reshaping

Water Rights and Water Supply

Alternative 2 would allow the U.S. to capture more of its share of the St. Mary River and increase the available water supply to Milk River Project beneficiaries. Reshaping the canal would restore its original conveyance capacity (850 cfs), and lining the canal would reduce seepage loss compared to current conditions in the first 9 miles. Under Alternative 2, these improvements would restore the St. Mary River's portion of the Milk River Project water rights. No additional water rights would be requested or allocated as part of this project.

In consideration of the effects of water flow changes within the St. Mary River and Milk River, representatives from Canada's Alberta Environment and Parks and the Montana DNRC cooperated as the Joint Initiative Team (JIT) to analyze the capture of the U.S. and Canada's share of the St. Mary and Milk River waters. The Water Resource Management Decision Support System (WRMDSS) was the model used to represent the reaches, structures, water supplies, and demands of the St. Mary River and Milk River Basins for long-term planning by simulating future conditions based on the past. Water supply data from 1959 to 2003 was used to project future water demands and management structures 30 years into the future. The model could generate more than 100 different results based on which structural and administrative options were chosen. Of the 100 different results, Canada continued to have over 100 percent of the annual entitlement of water rights (Joint Water Management Team 2015).

Reclamation holds a water right to divert 850 cfs year-round from the St. Mary River. However, actual diversion is constrained by watershed limitations and infrastructure capacity. Assuming no limitations from Sherburne Reservoir, Upper St. Mary Lake inflows, or IJC entitlements, the improved canal could deliver up to 279,425 AF/year (HDR 2024). However, when accounting for historical average U.S. entitlements (246,447 AF/year) and water availability constraints, the realistic average delivery is estimated at 205,937 AF/year (TD&H 2006).

Under Alternative 2, with the St. Mary Canal System improvements allowing for an increased delivery equal to 850 cfs, the alternatives could divert 303,471 AF. However, this assumes that a constant 850 cfs is diverted for the 180-day irrigation season. Given that the theoretical volume of water diverted at a constant 850 cfs (303,471 AF) is greater than the average availability in the watershed, the maximum amount diverted to the St. Mary Canal is limited to 205,993 AF. Furthermore, the estimated seepage and evaporation losses of the improved system are removed from the volume prior to the water being delivered to the North Fork of the Milk River. With the improvements proposed for Alternative 2, the seepage losses through the system are projected to decrease from 17,180 AF to 12,671 AF (HDR 2024). This is largely due to the proposed lining and canal reshaping associated with the project. Overall, Alternative 2 is projected to provide an increase in the volume delivered to the North Fork of the Milk River as noted below in Table 5-5. This increase in delivery and reliability of flows would be a moderate to major permanent benefit to the service area.

Table 5-5. Volumetric Impact of Alternative 2 Measures to Increase Conveyance

St. Mary Canal Water Deliveries	No-Action Alternative (Current System)	Alternative 2 Water Deliveries
Actual Amount of Water Diverted from St. Mary River from 1979 to 2004, assumed to continue (AF/yr)	175,339[1]	N/A
Total Max Diversion Based on Water Available (AF/yr)	182,124[4]	205,937[2]

St. Mary Canal Water Deliveries	No-Action Alternative (Current System)	Alternative 2 Water Deliveries
Additional Water Diverted Due to Increased Capacity (AF/yr)	0	23,813[3]
Seepage Losses (AF/yr) Assumes 180 days	17,180	12,671
Total Water Delivered to North Fork of Milk River (AF/yr)	164,944	193,266
Additional Water Delivered to North Fork of Milk River (AF/yr)	0	28,322

[1] TD&H 2006, Water volume at the St. Mary River Siphon inlet.
[2] TD&H 2006, Bimonthly median for 850 cfs diversion.
[3] Does not include seepage loss estimates.
[4] Utilizes 175,339 from TD&H 2006 and includes 9 miles of seepage to show the quantity diverted into the St. Mary Canal System.

Construction is anticipated to occur between March and November over many years. To the extent possible, construction would occur during times where there are no flows or minimal flows in the St. Mary Canal System. The construction season and the operation of the St. Mary Canal System would overlap, resulting in an impact on water supply during these years. Flows would be maintained to the extent possible to reduce the impact on Milk River Project beneficiaries. Construction timing would be determined through coordination with Milk River Project beneficiaries (e.g., municipalities, irrigation districts) during final design. Depending on weather and season, construction could have a temporary, minor effect on water supply.

Alternative 2 would modernize the St. Mary Canal System and reduce the risk of catastrophic failures. The St. Mary and Milk River Basins Study showed the effects of a catastrophic failure of the St. Mary Canal System on the monthly average pool elevations of the Fresno Reservoir (Figure 5-1). A St. Mary Canal System failure would cause a significant decrease in Fresno Reservoir elevations in all months of the year, with an up to 30-foot decrease in pool elevations during the peak summer season in August (Reclamation 2024). Implementation of Alternative 2 would increase flows in the St. Mary Canal System and downstream, which would increase the water available for recreational opportunities in the St. Mary Canal System, streams, and Fresno Reservoir.

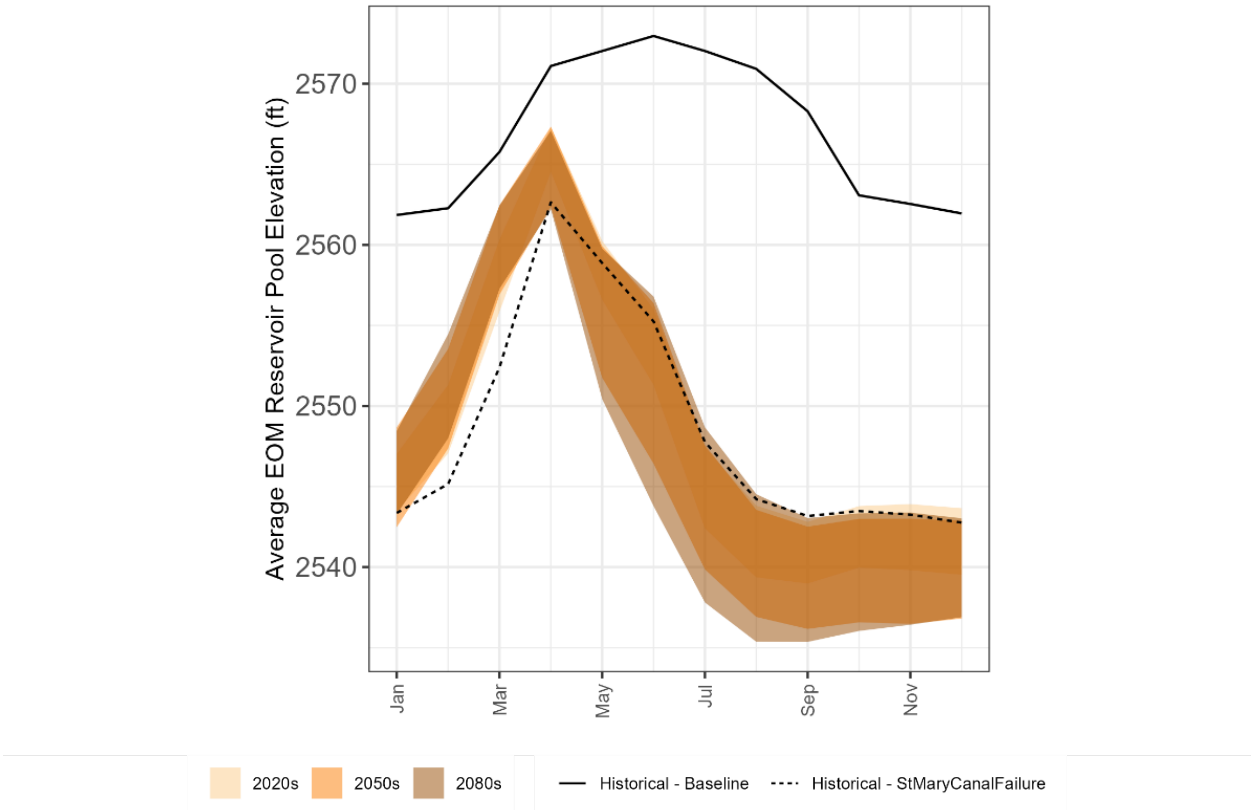

Figure 5-1. Fresno Reservoir Average End-of-Month Pool Elevation for a Canal Failure (Reclamation 2024)

Surface Waters and Water Quality

The lining within the first 9 miles of the canal would convert the canal bottom from the existing earthen bottom to a geosynthetic-lined bottom. The reshaping for the remainder of the 20 miles would use materials similar to existing.

For water quality consideration, lining and reshaping would reduce the amount of sediment eroded from the bed and banks of the canal. This reduction in sediment would improve water quality by lowering total suspended solids. The increased amount of water conveyed through the canal and into the Milk River would dilute concentrations of some parameters (e.g., total suspended solids) and benefit water quality. However, removing vegetation within and adjacent to the canal may affect water quality by increasing water temperatures slightly and decreasing nutrient cycling provided by the vegetation. Removed trees would not be replanted. Areas along the banks of the canal would be reseeded with grassland species. Beyond the banks of the canal, reestablishment of vegetative communities is anticipated; however, it is unknown which communities would ultimately establish. Therefore, there are expected to be minor, permanent, beneficial, and adverse impacts on water quality in the project area.

Under Alternative 2, St. Mary River flow downstream of the diversion dam would be reduced by 250 cfs during the times the St. Mary Canal System is in operation. Flow reduction within the St. Mary River could change the concentrations of monitored water quality parameters used to

determine if the waterbody is meeting its beneficial uses. This could cause some parameters to increase and affect the river's ability to meet its beneficial uses. The reduction in flow could change the erosion capabilities of the river, reducing the sediment transport. This change in water volume could have a minor to moderate effect on water quality within the St. Mary River from current conditions.

The Milk River's flow would be increased as shown in Table 5-5. Within the Milk River Basin, the diverted water flows from the St. Mary Canal System to the North Fork Milk River and then into the Milk River, which flows into the Fresno Reservoir. With higher flow rates, the Fresno Reservoir would receive the additional total volumes noted in Table 5-5. Montana DEQ has reported concerns with the Fresno Reservoir meeting the aquatic life beneficial use due to physical substrate habitat alterations and flow regime modifications. The changes in volume diverted to the canal would increase the sediment transport capacity and convey more sediment through the North Fork Milk River and Milk River. Per the report titled "Study of Erosion and Sedimentation on the Milk River" (2008), the additional flows conveyed to the North Fork of the Milk River and, in turn, the Milk River will potentially increase the widths of these streams through bank erosion. This water and sediment would be delivered to the Fresno Reservoir. Therefore, the increase in flow could cause minor to moderate effects on the Fresno Reservoir due to additional suspended sediment settling within the waterbody.

The canal would be disturbed during construction, and sediment may temporarily increase within the water column causing a minor, temporary effect on water quality parameters within the canal and downstream waterbodies. In addition to controlling the water velocities to a rate that will not produce erosive forces, the canal bottom and banks would be stabilized using vegetation or similar means to reduce the effects. Alternative 2 would have more than 1 acre of disturbance and would require a General Permit for Stormwater Discharges Associated with Construction Activity from EPA (Montana DEQ 2023). The permit would require the implementation of an SWPPP and BMPs for erosion prevention during construction. Additionally, work would be required to comply with Blackfeet Ordinance 117—the Blackfeet Aquatic Lands Protection Ordinance.

Wetlands and Waters of the U.S.

There are approximately 1,187.30 acres of existing wetlands present within 0.5 mile of the St. Mary Canal System along its length (see Chapter 3, Affected Environment, Section 3.4, Water Resources). Canal seepage and the direct surface connection to water flowing through the canal augments the hydrology to these wetlands due to the low permeability of the underlying unconsolidated sediments and bedrock.

The direct, permanent impacts due to lining and reshaping the canal were calculated and noted in Table 5-6. Temporary impacts during construction were calculated; these areas are anticipated to be reestablished. Refer to Appendix C3 for figures that display the impact areas. The canal reshaping included in Alternative 2 was designed largely on existing alignment to minimize impacts on wetland resources within the project and study areas. Overall, minor to moderate temporary adverse impacts are anticipated to occur during construction and moderate permanent adverse impacts are anticipated to occur with Alternative 2.

The following summarizes the calculated impacts on the wetland areas:

- *Direct, Permanent Impacts*: The wetland areas within the current grading limits for Alternative 2 were calculated. These areas would be filled, cut, and/or graded. These areas would not re-establish and would be permanently affected by Alternative 2. These areas include locations where the canal wall has essentially blown out. These blowout areas would be repaired using the fill, cut, or grading mentioned above.
- *Direct, Temporary Impacts*: Temporary impact area refers to the clearing and temporary work areas affected during construction. These areas were calculated within the upgradient side of the canal, between the grading and St. Mary Canal System ROW limits.
- *Indirect, Permanent Impacts*: Areas are anticipated to receive less seepage along the canal under Alternative 2 due to repairs to the canal's wall as well as the inclusion of the geosynthetic liner, both of which would reduce the amount of seepage available to adjacent wetlands.
- *Indirect, Neutral Effect*: Indirect effects that are neutral to positive are those impacts on wetland resources within 0.5 mile of the downgradient side of the St. Mary Canal System that are along the unlined 20 miles, are presumed to be influenced by seepage, and would receive similar seepage under Alternative 2. See Table 5-5 for the potential increase in seepage under Alternative 2.
- *Canal Wall Failure Areas*: In some locations along the canal, the bank has degraded to the extent that larger wetlands with open water areas have formed adjacent to the canal. These areas would be impacted by the reshaping of the canal, either through permanent diminishing area or by a shift in wetland type.

A detailed analysis of permanent and temporary impacts on wetlands and surface waters would be completed during final design phase of the project. As final design continues, more details of the effects would be determined and need to be coordinated with the USACE Regulatory Office, Blackfeet Environmental Resources Office, and NRCS, which has jurisdiction over EO 11990.

The following steps needed to be taken during final design of each phase of the project:

- A field delineation would need to be completed within 5 years of planned construction for each identified phase of the project.
- Upon the completion of the field delineation, an approved jurisdictional determination would be requested from the USACE Regulatory Office for each identified aquatic resource.
- A preapplication meeting would be held with the USACE Regulatory Office. The meeting would include discussion of the approach to the permitting process, mitigation requirements, and the applicability of the exemptions (404(f)(1)) of the CWA and associated requirements of discharges to WOTUS that would not require a permit (33 CFR 323.4).

- An impact analysis would be completed to determine the effects on wetlands and surface waters since those closer to the canal could be affected more, and those further away could be affected less. It is difficult to determine the exact effect since some seepage would continue, and the amount is unknown. In some cases, wetlands may continue to exist, but the change in hydrology may shift the type of wetland present. An example would be a change from a permanently flooded wetland to a semipermanent flooded wetland.
- A Section 404 permit application would be completed, if determined necessary from the preapplication meeting with USACE. Mitigation would be identified for the permanent impacts due to the project through use of mitigation banks and on-site or off-site mitigation options. A mitigation plan would be completed for each phase and included with the Section 404 permit application.
- Coordination with the Blackfeet Tribe would be completed for compliance with Section 401 as part of the Section 404 permitting process.
- Coordination would be completed with NRCS for compliance with EO 11990. Wetlands that are jurisdictional under USACE will be noted within the Section 404 permitting process. Non-jurisdictional, natural wetland impacts would need to be considered further under EO 11990, and NRCS would make a determination on the requirements due to the impacts.

Table 5-6. Wetland and WOTUS Impacts for Alternative 2

Segment	Direct, Permanent Impact[1] (acres)	Temporary Impact Area (acres)[2]	Indirect Effects (acres): Permanent (Adverse)[3]	Indirect Effects (acres): Permanent (Neutral - Positive)[4]	Permanent Impacts, Canal Wall Failure Areas (acres)[5]
Diversion Dam to St. Mary Siphon (9-Mile Segment)	12.78	10.15	313.57	0.00	11.02
St. Mary Siphon to Drop Structure 5 (20-Mile Segment)	16.31	22.50	66.41	206.25	24.80
Total Area of Wetlands and WOTUS	29.09	32.65	379.98	206.25	35.82

[1] Direct, permanent impacts are areas within the grading limits.

[2] Temporary impact area refers to the clearing and temporary work areas affected during construction.

[3] Indirect, permanent impact areas are areas that would receive less seepage due to lining.

[4] Indirect, neutral impacts are neutral to positive effects on wetlands within the 0.5-mile buffer.

[5] Permanent, bank failure areas would be impacted by the reshaping of the canal, either through permanent diminishing area or by a shift in wetland type.

Groundwater

Most wells in the vicinity of the canal probably obtain water from relatively localized unconsolidated deposit aquifers, which are recharged mainly by snowmelt. The wells may obtain minor water quantities from bedrock aquifers that are overlain by unconsolidated deposits. Because of the formation, permeability, and use of the local aquifers, it is unlikely that wells in the region are supplied to a great degree by canal seepage. Furthermore, the density of domestic and stock watering wells, especially in the vicinity of the central and eastern portions of the canal, is so low that localized unconsolidated deposit aquifers probably supply their small annual volumes with no need for additional recharge from canal seepage losses. Therefore, permanent impacts on groundwater are expected to be negligible.

During construction, the water levels within the canal are anticipated to be similar to existing conditions. Therefore, impacts on groundwater are anticipated to be negligible, temporary effects.

Floodplains

No FEMA designated floodplains occur in the project area. Minor areas of alluvial soils are located within the project area. Although there are no FEMA designated floodplain areas, floodplains do exist for the canal crossings. Areas within potential floodplains vary dependent on location along the canal but include forest/shrubland suitable for wildlife, wetland habitat that may be used by aquatic species, agricultural lands, grazing lands, and some potential temporary floodwater storage areas. These areas would be temporarily impacted by lining and reshaping. Alternative 2 would avoid catastrophic failure of the St. Mary Canal System, which causes emergency flooding to adjacent lands.

The additional 250 cfs would be part of the flow restored within the canal. The flow would continue into the North Fork Milk River, Milk River, Fresno Reservoir, and their associated floodplains (mapped and unmapped). Each floodplain previously experienced this flow before the canal became deteriorated; therefore, it is assumed their floodplains have the capacity to retain this flow during high water levels. This would result in negligible, permanent effects on floodplains.

During construction, temporary effects on the local unmapped floodplains are anticipated since the area within and adjacent to the canal would have ground disturbing activities. These effects are anticipated to be minor.

Siphon Modification

Kennedy Creek Siphon modification would have the same impacts and effects as discussed in Alternative 2, Lining and Reshaping, and are included in the wetland and surface water calculations. Of note, the impact on Kennedy Creek is anticipated to be similar. Stream flows would remain uninterrupted during the siphon modification as described in Section 4.4.2. Existing streambed materials would be replaced and regraded to pre-construction conditions to minimize impacts on the stream's flows and water quality. Additionally, impacts on wetlands and WOTUS are minimized using the phased construction method for siphon modification.

Drop Structure Replacement

Drop Structure replacement would have the same impacts and effects as discussed in Alternative 2, Lining and Reshaping, and are included in the wetland and surface water calculations. As part of this alternative, the proposed structures would be adjacent to existing structures, so impacts on wetlands and the canal would be minimal compared to siting the structures on an entirely new alignment.

Slope Stability (Slide Mitigation)

Slope stability improvements would have the same impacts and effects, except for water quality and quantity, as discussed in Alternative 2, Lining and Reshaping, and are included in the wetland and surface water calculations. Slope stability would have an additional beneficial effect on water quality as sedimentation in the water column would be reduced due to lessening the slope stability failures.

During construction, most of the proposed slope stability activities would be completed outside of the bottom and sides of the canal. A portion of the work would need to occur within the canal and, if done during the main water conveyance season, could affect the water quantity for users. This would have a minor, temporary effect and would be localized within the canal.

O&M Road Improvements

O&M road improvements would have the same impacts and effects on wetlands and surface waters for cut and fill activities as discussed in Alternative 2, Lining and Reshaping, and are included within those calculations. Impacts to wetlands and WOTUS were minimized by designing the O&M road largely on existing alignment.

Wasteways, Spillways, and Drains

Wasteways, spillways, and drains would have the same impacts and effects as discussed in Alternative 2, Lining and Reshaping, and are included in the wetland and surface water calculations. In addition, improvements to wasteways, spillways and drains are anticipated to cause improvements to drainage and flood management during times of high release and heavy precipitation. This would improve soil stability within the drainage area. Additional wasteways and drains are not included in the design for this Alternative at the time of this report.

Underdrains (Culverts)

The underdrains would be increased by 6 inches in diameter to accommodate the flows of the stream and drainage crossings under the canal. Impacts to wetlands and WOTUS are minimized by replacing underdrains at existing locations, avoiding additional disturbances within the project area. Additional underdrains may be added during final design if runoff or other drainages are noted. The underdrains would help support canal flood management by allowing efficient relief and conveyance with both the flows from streams and drainages, and during times of runoff. Flows through the underdrains would remain uninterrupted during construction as the new structures would be constructed directly adjacent to the existing ones allowing water

to continue to flow throughout the process. The impacts are included within Alternative 2, lining and reshaping, to wetlands and surface waters.

5.4.3 Action Alternative (Alternative 3 – Canal Modernization, Reshape)

Lining and Reshaping

Under Alternative 3, the first 9-mile segment of the St. Mary Canal System would not be lined and only would be reshaped. The measures identified under Alternative 2, except for the lining, would be installed to modernize the canal delivery system to improve delivery capacity and reliability. Figure 4-1 and Figure 4-2 depict the difference between the earthen or lined routes along the canal.

Water Rights and Water Supply

Under Alternative 3, the water flow and impacts would be similar to Alternative 2. Reshaping the canal would restore its original conveyance capacity (850 cfs). Table 5-7 presents the difference in volumes delivered under Alternative 3. These modeled values represent the increase in deliveries above the No-Action Alternative.

Table 5-7. Volumetric Impact of Project Measures to Increase Conveyance (HDR 2024b)

St. Mary Canal Water Deliveries	No-Action Alternative (Current System)	Alternative 3 Water Deliveries
Actual Amount of Water Diverted from St. Mary River from 1979 to 2004, assumed to continue (AF/yr)	175,339[1]	N/A
Total Max Diversion Based on Water Available (AF/yr)	182,124[4]	205,937[2]
Additional Water Diverted Due to Increased Capacity (AF/yr)	0	23,813[3]
Seepage Losses (AF/yr) Assumes 180 days	17,180	19,455
Total Water Delivered to North Fork of Milk River (AF/yr)	164,944	186,482
Additional Water Delivered to North Fork of Milk River (AF/yr)	0	21,538

[1] TD&H 2006, Water volume at the St. Mary River Siphon inlet.

[2] TD&H 2006, Bimonthly median for 850 cfs diversion.

[3] Does not include seepage loss estimates.

[4] Utilizes 175,339 from TD&H 2006 and includes 9 miles of seepage to show the quantity diverted into the St. Mary Canal System.

Surface Waters and Water Quality

Under Alternative 3, the water low impacts will be similar to Alternative 2, during operations. This change in water volume could have a minor to moderate effect on water quality within the St. Mary River from current conditions.

The Milk River's flow would be increased as shown in Table 5-7. The changes in volume conveyed by the canal due to modernization and reshaping would increase the sediment transport capacity and convey more sediment through the North Fork Milk River and Milk River. This water and sediment would be delivered to the Fresno Reservoir. Therefore, the increase in flow could cause minor to moderate effects on the Fresno Reservoir due to additional suspended sediment settling within the waterbody.

Wetlands and Waters of the U.S.

Under Alternative 3, the first 9-mile segment of the St. Mary Canal System would only be reshaped, no geosynthetic liner would be added. Canal seepage and the direct surface connection to water flowing through the canal augments the hydrology to these wetlands due to the low permeability of the underlying unconsolidated sediments and bedrock. The additional seepage may have beneficial impacts on wetlands adjacent to the St. Mary Canal System because it would continue to feed and maintain many of the existing wetlands.

Table 5-8 shows the wetland impacts for Alternative 3, of which the first 9 miles would differ due to the difference in seepage. Also see Appendix C3 for wetland impact mapping for this Alternative. Alternative 3 would have more anticipated seepage, above the existing conditions; therefore, less wetland area would be indirectly affected.

Table 5-8. Wetland and WOTUS Impacts for Alternative 3

Segment	Direct, Permanent Impact[1] (acres)	Temporary Impact Area (acres)[2]	Indirect Effects (acres): Permanent (Adverse)[3]	Indirect Effects (acres): Permanent (Neutral - Positive)[4]	Permanent Impacts, Canal Wall Failure Areas (acres)[5]
Diversion Dam to St. Mary Siphon (9-Mile Segment)	12.85	12.87	0	304.78	11.02
St. Mary Siphon to Drop Structure 5 (20-Mile Segment)	17.242	21.38	66.41	207.63	24.80
Total Area of Wetlands	30.09	34.25	66.41	512.41	35.82

[1] Direct, permanent impacts are areas within the grading limits.

[2] Temporary impact area refers to the clearing and temporary work areas affected during construction.

[3] Indirect, permanent impact areas are areas that would receive less seepage.

[4] Indirect, neutral impacts are neutral to positive effects on wetlands within the 0.5-mile buffer.

[5] Permanent, bank failure areas would be impacted by the reshaping of the canal, either through permanent diminishing area or by a shift in wetland type.

A detailed analysis of these additional permanent impacts on wetlands and surface waters would be completed during final design for each reach of the St. Mary Canal System. The analysis is needed to determine effects on wetlands and surface waters since those closer to the canal could be affected more, and those further away could be affected less. It is difficult to determine the exact effect since some seepage would continue, and the amount is unknown.

Groundwater

Impacts under Alternative 3 would be similar to Alternative 2. During construction, the water levels within the canal are anticipated to be similar to existing conditions. Therefore, impacts on groundwater are anticipated to be negligible, temporary effects.

Floodplains

Impacts under Alternative 3 would be similar to Alternative 2. During construction, temporary effects on unmapped floodplains are anticipated since the area within and adjacent to the canal would have ground disturbing activities. These effects are anticipated to be minor.

5.5 Terrestrial and Aquatic Species

5.5.1 No-Action Alternative (Alternative 1 – FWOFI)

Under the No-Action Alternative, St. Mary Canal System operations and water delivery would continue as in the past; however, the volume would likely continue to slowly diminish as seepage and leakage increase. Canal seepage would continue to contribute to the hydrology of adjacent wetlands and intersecting drainages, which would continue to have a minor to moderate beneficial impact on the terrestrial and aquatic species that use these areas as habitat or as a water source. Management of noxious weeds and invasive species would continue in accordance with Reclamation's current ongoing practices.

In the long-term, without system improvements, the potential for system failure would increase, which could result in habitat loss and mortality to smaller, slow-moving terrestrial species within and adjacent to the canal and aquatic species within the canal due to flooding or landslides in the project area. These adverse impacts would be temporary and minor to moderate.

A potential system failure would decrease or eliminate the St. Mary Canal System's ability to convey water, which would affect the quantity and availability of water needed to support wildlife and fish species downstream in the service area. Particularly, aquatic species currently benefiting from the seasonal augmented flows in the North Fork Milk River and Milk River would be affected should the St. Mary Canal System's ability to deliver water be compromised. These adverse impacts would be temporary to permanent and minor to moderate.

5.5.2 Action Alternative (Alternative 2 – Canal Modernization, Lined/Reshape)

Lining and Reshaping

General Habitat and Vegetation

Reshaping the canal and its components is anticipated to occur over several years and would require vegetation removal within the proposed grading limits for Alternative 2. Impacts on mature vegetation due to canal reshaping would be more substantial on the south/west side (the side of the St. Mary Canal System opposite from the existing O&M road). These areas include grassland, forest and woodland systems (Table 3-9). The existing grassland areas are anticipated to be reestablished. Within the forested and woodland systems, the trees and

shrubs would be removed totaling 55.14 acres of woody vegetation removal (see Appendix C2 and Table 5-2). Trees would not be replanted, and therefore, these areas within the working limits are expected to be converted to grassland. The conversion of these forested areas would impact the amount of available wooded habitat for species within the project area. This would have impacts on the corridor connection for wildlife both on a temporary and long-term basis. It is likely that during the construction of Alternative 2, wildlife would be deterred from the area due to increased human presence, heavy machinery and noise. Tree removal completed during construction would cause a permanent change to the landcover in the forested areas directly along the St. Mary Canal System. These changes would require terrestrial species to utilize grassland areas, with less cover and more exposure than forested areas, to get to the forested areas to the east of the St. Mary Canal System or travel further to adjacent forest cover. Removal of trees within the project area is anticipated to have a minor to moderate, permanent impact on current wildlife movement patterns. Minor impacts to species who utilize the forested areas directly along the St. Mary Canal System are anticipated. Many of the species impacted are anticipated to relocate to nearby forested areas.

Vegetation impacts would be minimized by limiting grading impacts on the existing canal footprint, which is largely void of mature vegetation, to the extent possible (see Appendix C1). During construction, temporary impacts on vegetation would occur due to vehicle movement, staging, and other construction activities. During construction, impacts on the vegetative community are anticipated to be moderate and would be minimized using BMPs and standard practices, such as minimizing ground and soil disturbance to the minimum amount necessary and ensuring proper erosion control measures are in place. Temporary vegetation impacts would be mitigated through implementation of a revegetation plan to ensure that temporarily disturbed areas are seeded with desirable species and monitored until vegetation has been reestablished. Under the National Pollutant Discharge Elimination System (NPDES), soil replacement and reseeding would be required.

Table 5-9. General Land Cover Affected by Alternative 2 (MTNHP 2023a)

Land Cover Type	Ecological System	Temporary Disturbance in Project Area (acres)	Permanent Disturbance in Project Area (acres)	Total Disturbance in Project Area (acres)
Open Water	Open Water/ Wetlands and Riparian Systems	97.41	161.72	259.13
Other Road	Human Land Use	75.55	114.98	190.86
Great Plains Riparian	Open Water/ Wetlands and Riparian Systems	48.44	18.40	66.84
Rocky Mountain Lower Montane, Foothill, and Valley Grassland	Grassland Systems	38.56	10.26	48.82

Land Cover Type	Ecological System	Temporary Disturbance in Project Area (acres)	Permanent Disturbance in Project Area (acres)	Total Disturbance in Project Area (acres)
Rocky Mountain Alpine-Montane Wet Meadow	Open Water/Wetlands and Riparian Systems	23.27	13.09	36.36
Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland	Open Water/Wetlands and Riparian Systems	16.55	6.32	22.87
Pasture/Hay	Human Land Use	12.40	3.59	15.99
Great Plains Mixed Grass Prairie	Grassland Systems	10.45	4.55	15.0
Developed and Urban Vegetation	Developed	7.87	3.16	11.03
Western Cool Temperate Row Crop - Close Grown Crop	Agricultural	5.18	1.15	6.33
Developed - Low and Medium Intensity	Developed	6.04	3.61	9.65
Northern Rocky Mountain Subalpine-Upper Montane Grassland	Grassland	5.16	1.47	6.63
Northern Rocky Mountain Montane-Foothill Deciduous Shrubland	Shrubland	4.08	0.43	4.51
Major Road	Developed	1.75	0.11	1.86
Middle Rocky Mountain Montane Douglas-fir Forest and Woodland	Conifer	1.04	0.49	1.53
North American Arid West Emergent Marsh	Riparian	1.17	0.47	1.64
Rock Outcrop, Scree or Rubble Land	Sparsely Vegetated	0.09	0.46	0.55
Northwestern Great Plains Shrubland	Shrubland	0.5	0.08	0.58
Rocky Mountain Foothill Limber Pine-Juniper Woodland	Conifer	0.89	0.11	1.00
Rocky Mountain Subalpine-Montane Mesic Meadow	Grassland	0.43	0.2	0.63

Land Cover Type	Ecological System	Temporary Disturbance in Project Area (acres)	Permanent Disturbance in Project Area (acres)	Total Disturbance in Project Area (acres)
Barren or Limited Vegetation	Sparse and Barren Systems	0.001	0	0.001
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest	Conifer	0.10	0.12	0.22
Northern Rocky Mountain Mesic Montane Mixed Conifer Forest	Conifer	0.11	0.06	0.17
Rocky Mountain Lodgepole Pine Forest	Conifer	0.01	0	0.01
-	**Total**	**357.38**	**344.83**	**702.21**

Noxious Weeds and Invasive Vegetation Species

As noted in Section 3.5.1, noxious weeds and their seeds are present within the project area. Construction activities associated with Alternative 2, such as earthwork, equipment movement, and increased foot traffic, could increase the risk of spreading invasive species. Without proper control measures, this alternative may contribute to further spread, especially in areas already known to have infestations (e.g., between the main diversion and the St. Mary Siphon).

The NRCS (2025) provides management and removal guidance for several noxious weed species likely present in the study area. For species not covered by NRCS, MTNHP offers additional management options. These strategies would be implemented during and after construction to minimize the spread of invasive plants, with a focus on Canada thistle and spotted knapweed, two species already well-documented in the area. Control strategies to be included for this project:

- Planting competitive native perennials, Reclamation and MRJBOC would coordinate with NRCS office to identify seed mixes for the project during final design.
- Herbicide application would be applied after construction. The most effective application is at bud stage or during fall regrowth; fall spraying can damage root systems and increase winter kill; wick applicators are preferred to minimize damage to non-target plants. Special care is needed in riparian zones along the canal to avoid herbicide contamination of water resources (MTFWP 2008).

An Integrated Pest Management (IPM) approach would be completed, emphasizing coordination with the NRCS, Reclamation, MRJBOC, Glacier County, and the Blackfeet Tribe. This would include developing a herbicide application plan and planting schedule. Along the O&M road, particularly near the main diversion and St. Mary Siphon, mowing, tilling, and

herbicide use may be applied. Disturbed areas would be revegetated as soon as possible after construction to reduce the risk of weed colonization. The IPM would also include the following BMPs:

- Cleaning all equipment and vehicles of organic debris and soil before entering or leaving the site
- Avoiding travel through heavily infested areas when possible
- Proper disposal of removed vegetation from infested zones
- Topsoil should be stockpiled and reused unless the area is already dominated by invasive species. In such cases, topsoil should be replaced with material from less infested areas. Stockpiles should be covered or revegetated promptly to prevent colonization.

Terrestrial Species

Habitat alteration would occur in areas directly affected by the cut/fill and grading activities for canal lining and reshaping. Removal of trees would permanently alter the habitat adjacent to the canal and affect terrestrial species by eliminating potential food sources or areas used for shade/cover and foraging. The conversion of these forested areas would impact the amount of available wooded habitat for species within the project area. This would have minor to moderate impacts on the corridor connection for wildlife both on a temporary and long-term basis.

Impacts on terrestrial species due to removal of shrubs and/or grasses and herbaceous vegetation would have less of an effect because these vegetation types would be able to reestablish more quickly than forested habitat following construction. The permanent ROW adjacent to the 9-mile segment of the canal that would be lined would be maintained without trees. Impacts on terrestrial species due to vegetation removal are anticipated to be minor given the ample amount of adjacent suitable habitat in the project area vicinity.

Under Alternative 2, the ability of wildlife to exit the canal is anticipated to be similar to current conditions. During the irrigation season, the canal likely serves as a barrier to most wildlife movement. The addition of the geosynthetic liner may indirectly affect adjacent wetland habitat used by terrestrial species by reducing seepage, which could diminish the habitat quality over time. Canal seepage has created watering locations for several species. The reshaping, and particularly the lining of the canal, would reduce seepage on the downgradient side and, therefore, affect some of the watering locations. However, wildlife species could use other reliable water sources within the project area vicinity. In some cases, species would need to find new locations if the water diminishes. Therefore, lining and reshaping the canal is expected to have minor to moderate, long-term impacts on terrestrial species.

During construction, large mammal species (e.g., deer, antelope, elk) and predatory species (e.g., wolves, Canada lynx, bears) within the project area are anticipated to be temporarily impacted by the increased presence of humans, noise from machinery, and other construction

activities. Most impacts on these species would be minor and temporary as the species would likely disperse from or avoid the project area and relocate to adjacent suitable habitat. These large and predatory species would likely return to the project area following completion of Alternative 2. Construction is anticipated to occur between the months of March and November. The additional traffic within the area during construction seasons may increase vehicle-animal collisions temporarily. Therefore, construction activities are anticipated to have minor, temporary impacts on large mammal species in the project area.

During construction, smaller species, such as small mammals (e.g., beaver, snowshoe hare, striped skunk), reptiles (e.g., lizards, snakes), and terrestrial amphibians (e.g., frogs, toads, salamanders) would largely experience minor to moderate short-term impacts. Impacts on these species are likely due to habitat disturbance including earth work, vegetation removal, and wetland impacts. These impacts would be minor as most individuals would be able to travel to adjacent suitable habitats. Some individuals may experience mortality during construction activities; however, many would be expected to relocate outside of the project area to similar habitats. Impacts, including death of individuals, are not anticipated to affect the regional populations or the presence of any of these smaller species.

Migratory Birds and Eagles

Numerous migratory bird species, including both SOCs as well as eagles and other raptor species, occur within or near the project area. Removal of mature trees would reduce the availability of habitat used for nesting, perching, and foraging habitat. Impacts on deciduous forest habitat would occur primarily along the western portion of the canal where forested habitat exists. The eastern portion of the St. Mary Canal System is within shrubland and grassland, which provide habitat for many migratory bird species. Removal of shrubby vegetation cover would affect habitat used by migratory species. Although habitat would be affected, the project occurs in a region with ample suitable bird habitat; therefore, a minor to moderate, long-term effect is anticipated. Indirect effects on birds are anticipated to be mixed. Reduced seepage may slowly decrease wetland habitat adjacent to the canal within the first 9 miles, and the water delivered downstream benefits the Milk River watersheds due to increased water delivery and reliability, including places like Bowdoin National Wildlife Refuge, which is an important stopover area for migratory waterfowl (USFWS 2023, Montana Department of Natural Resource Conservation 2023, Graetz 2024).

USFWS and MTFWP maintain data for known bald and golden eagle nesting sites. Before construction, Reclamation and MRJBOC would coordinate with USFWS and Blackfeet Tribal biologists to identify known active nests. A qualified biologist would field verify if any trees within 0.5 mile of the project site are actively being used for eagle nesting. If nesting is identified, coordination with USFWS would occur to incorporate BMPs during the entirety of the construction process to minimize impacts on eagles and raptors within the vicinity of the project area. To minimize impacts on migratory birds, vegetation clearing would be conducted during the non-nesting period, or a qualified biologist would survey the site before construction begins to identify any nesting sites. If sites are identified, coordination would occur with NRCS and USFWS.

Fish and Aquatic Species

Fish entrainment has been documented within the St. Mary Canal System. Although SOC/PSOC (trout-perch, bull trout, westslope cutthroat trout, spoonhead sculpin, and lake trout) have been known to occur in waterbodies within the study area, the St. Mary Canal System is not suitable long-term habitat for fish species and is not managed as fish habitat. The replacement of the St. Mary Diversion Dam has been completed prior to this project and includes improvements to the diversion structure to reduce or eliminate entrainment of fish into the canal. As such, implementation of Alternative 2 would have no effect on fish entrainment, including fish SOC, into the canal. Lining and reshaping would increase delivery reliability of the St. Mary Canal System and subsequently increase delivery of water to the North Fork Milk River, which would benefit fish and aquatic species due to the augmented flows.

Lining and reshaping would allow the canal to convey water at the original design capacity of 850 cfs. After construction, the current diversion rate is expected to increase from approximately 600 to 650 cfs to approximately 850 cfs. This would increase the quantity of water delivery to downstream waterbodies, such as the North Fork Milk River, Milk River, and Fresno Reservoir, where many fish species exist (see Alternative 2, Lining and Reshaping, for more information). Lining and reshaping would lessen potential system failure events, which create large flow changes and water quantity and quality variance that affects fish species. Minor impacts to water quality to waterbodies associated with the project are anticipated during and shortly after construction due to sediment runoff surrounding the construction sites. Standard BMPs would be used to minimize runoff into these waterbodies. Water quality impacts are not anticipated to impact fish/aquatic species long-term. Improved water delivery should improve long-term fish habitat and habitat quality for many species within the Milk River Basin, resulting in a long-term, minor, beneficial impact on fish species in downstream waterbodies in the service area. This would decrease water delivery to the St. Mary River by approximately 200 to 250 cfs. The St. Mary River discharge range is 1,000 to 5,000 cfs during the months the water would be diverted within the St. Mary Canal System (Reclamation 2023). The diverted water would have a negligible to minor effect on the fisheries within the St. Mary River, since the discharge is within this range and has a reliable source from Glacier National Park.

Some aquatic habitats, including wetlands adjacent to the canal, would be permanently impacted by reconstructing and reshaping the canal embankments. The canal improvements, and particularly lining of the canal, would reduce seepage, which would indirectly cause adjacent aquatic habitat to lose hydrology and could affect the quantity and quality of adjacent aquatic habitat. These impacts are anticipated to be minor over the long term. The 9 miles of the canal where geosynthetic liner would be installed would permanently impact areas of benthic habitat for aquatic species. This would be a minor to moderate permanent impact as the entirety of the canal would not be lined, so additional habitat would be available both upstream and downstream of the lining.

Because the canal is not intended to provide suitable aquatic habitat and because work is anticipated to occur during no and low flow periods to the extent possible, implementation of Alternative 2 is anticipated to have a minor, temporary to permanent effects.

Threatened And Endangered Species

As discussed in Section 3.5.5, a BA is currently being prepared for submittal to USFWS regarding federally listed species within the scope of Section 7 of the ESA that would be potentially affected by the project. For this project, there will be no analysis for whitebark pine (*Pinus albicaulis*), because it does not occur in the action area. In addition, the monarch butterfly will not be analyzed since neither Section 7 of the ESA, nor the implementing regulations for Section 7, contain requirements for federal agencies with respect to candidate species. If the status of the monarch butterfly should change prior to finalization of the Plan-EIS, an addendum to this BA would be prepared with updated information. The following information provides a summary from the BA of the effects determination for each threatened or endangered species noted within the IPaC:

- *Canada lynx*
  No occurrence records of Canada lynx have been documented within the project area. There is not adequate habitat available in the construction area to support Canada lynx; therefore, it is highly unlikely that Canada lynx would be present in the vicinity of construction activities. Additionally, the proposed action would not result in changes to ecological systems that would result in altered predator/prey relationships and would not increase the project footprint or human presence in the action area. Reclamation and NRCS determined the project would have no effect on Canada lynx due to lack of preferred habitat within the project area.
- *North American wolverine*
  No known wolverine occurrence records or den sites are located in or near the project area. The project area would not provide suitable habitat or connectivity for wolverines and lacks the higher elevation they prefer. Reclamation determined the project would have no effect on the North American wolverine due to the limited area affected by the activity and the availability of displacement areas. No known den sites are in or near the project area.
- *Grizzly bear*
  The duration and scale of noise disturbance associated with the proposed actions could adversely affect grizzly bear use of nearby foraging habitat. Associated construction activities would be located within the NCDE, PCA, Zone 1 and Zone 3, Blackfeet Reservation BMU for grizzly bears. It is likely that a bear could be found within these zones. Noise and disturbance associated with construction activities have the potential to extend outward up to 1 mile from the project footprint. It is likely that grizzly bears in the area would perceive this noise and likely leave the area; however, habituation could occur causing human-bear interaction. Mortality risk to the grizzly bear is expected to slightly increase because of the proposed action. Reclamation and NRCS determined the project may affect, not likely to adversely affect the grizzly bear.
- *Bull trout*
  The proposed action has the potential to affect fish that are moving through the system concurrently with construction and removal activities since bull trout are known to use Kennedy Creek as a spawning area. In-water construction has the potential to trap,

injure, or kill bull trout, and has the potential to create a temporary disturbance barrier that prevents fish from passing upstream or downstream to preferred habitats and spawning areas. The proposed action would result in short-term degradation of water quality in bull trout waters during the construction period; however, due to measures to minimize sediment inputs to the river, and the low probability of bull trout occurrence, impacts from potential elevated sediment levels associated with construction are minimal. Due to these potential impacts, Reclamation and NRCS determined the project may affect, likely to adversely affect bull trout.

No federally designated bull trout critical habitat exists within the action area; therefore, Reclamation determined the project would have no effect on bull trout critical habitat.

Conservation Measures

To mitigate short-term construction-related impacts on grizzly bears, specific conservation measures would be implemented. This includes compliance with the Blackfeet Nation Fish and Wildlife Code Chapter 4. The Blackfeet Nation implements and monitors for compliance with attractant storage regulations in areas of normal grizzly occupancy—which includes the project's study area. Proper food storage containers would be required to be used on site, this includes storage in a bear-resistant manner. Containers should comply with the latest standards set by the Interagency Grizzly Bear Committee. Purchasers, employees, contractors, and subcontractors must store trash in bear-resistant containers, remove trash daily, and refrain from feeding wildlife. Regulations are enforceable by Tribal wardens and Tribal police. Additionally, any spills or litter must be cleaned promptly, and disturbed areas would be reseeded and restored post-construction with native trees and shrubs to support the local ecosystem. Construction activities would cease if grizzly bears are present in the work zone

Conservation measures to minimize short-term construction-related noise and human impacts on bull trout include limiting in-water work in Kennedy Creek to the essential tasks, such as the construction and removal of necessary support structures. Erosion control measures would be implemented to prevent sediment and turbidity from compromising water quality in Kennedy Creek. Work would be conducted within a designated in-water work window from July 15 to December 1 to facilitate fish movement. Additionally, isolating the work area would help reduce noise and turbidity while verifying that upstream and downstream passage for bull trout is maintained throughout the construction process.

Siphon Modification

Alternative 2 would require in-stream work on Kennedy Creek for the siphon modification. Standard BMPs and environmental permit conditions would be followed to minimize impacts. During construction of the new RCB at Kennedy Creek, stream flows would be maintained through one of the two braided channels throughout construction as described in Section 4.4.2 to minimize impacts to fish and aquatic species. Using this method of construction, minor to moderate, temporary impacts to resident fish and aquatic species would be anticipated at this location due to water temporary water quality impacts. Impacts to aquatic species would be further minimized by replacing existing streambed materials and regrading to pre-construction conditions as described in Section 5.4.2. No long-term effects on fish and aquatic species within

Kennedy Creek are anticipated as a result of siphon modification. Minor impacts on water quality are anticipated.

Impacts to the federally endangered bull trout may include direct mortality of fish, temporary displacement of fish from the action area, impacts to supporting aquatic or riparian habitats in the action area, and reduction of water quality caused by sediment/turbidity. The BA determined that the project would have a may affect, likely to adversely affect the bull trout.

Construction impacts are anticipated to be similar to those discussed in Alternative 2, Lining and Reshaping.

Drop Structure Replacement

Impacts would be similar to those discussed in Alternative 2, Lining and Reshaping. The Drop Structure replacements would be in locations adjacent to the existing Drop Structures. The new Drop Structure locations would remove the grassland/shrubland habitat in this area, which is approximately 600 feet long by 300 feet wide in three locations. Therefore, a minor impact on habitat is anticipated.

Slope Stability (Slide Mitigation)

Slope stability improvements would have impacts similar to those described in Alternative 2, Lining and Reshaping, due to the need to reconstruct the canal and banks at the multiple slide mitigation areas. The overall footprint and grading impacts would vary depending on the site. Slope stability improvements would have a beneficial effect by stabilizing sediment and preventing it from entering the canal where it would then be transported to the North Fork Milk River and could contribute to the total suspended solids and affect fish and other aquatic species.

O&M Road Improvements

Some vegetation impacts would occur due to the regrading and improvements to the O&M road located on the north/east side of the St. Mary Canal System. Minimal widening of the existing road would occur to achieve the proposed 12-foot width. Impacts from O&M road improvements are anticipated throughout construction of the project as well as the year following completion of St. Mary Canal System improvements. Management and restoration tactics used by the Montana Department of Transportation may be incorporated in the prevention and management of noxious/invasive species along the O&M roadway (MTDOT 2018). Additionally, traffic along the O&M road is anticipated to increase during the construction phase of this project. Overall, the O&M road improvements would have minor, permanent impacts on species.

Wasteways, Spillways, and Drains

The proposed wasteways, spillways, and drains would largely replace existing structures in approximately the same locations, and they would be similar to the existing structures; therefore, no long-term effect on terrestrial and aquatic species is anticipated. Fish and aquatic species may temporarily be impacted by construction activities as water flows through the wasteways and drains are cut off to complete work. This would have a minor, temporary impact

on these species. An additional temporary impact due to sediment and other construction runoff during this phase may have minor impacts on water quality and therefore may have minor temporary impacts on fish and aquatic species. Vegetation removal and grading would be required for drain replacements, creating temporary to short-term, minor effects on aquatic and terrestrial species. Additional spillways are not anticipated to impact species beyond the minor temporary impacts during construction. Work on wasteways, spillways, and drains will be completed concurrently with canal realignment/lining and is anticipated to occur over several years.

Underdrains (Culverts)

The proposed underdrains (culverts) would replace the existing structures in approximately the same location and operate similar to the existing structures; therefore, no long-term effect on terrestrial and aquatic species is anticipated. Replacement underdrains would be appropriately sized (sizes to be determined during final design) to allow the natural drainage flows to continue through the area and minimize impact to fish and aquatic species present within the waterbodies. Additionally, when determined to be required culverts would be appropriately countersunk to best mimic the natural environment and to improve pass ability through the culverts.

The existing underdrains would remain in place for water to continue to flow through during the construction of the new structures. Following construction of new underdrains, the old ones would either be removed or decommissioned, and water flows would be diverted to the new underdrains. Minor temporary impacts on fish and aquatic species are anticipated to occur during the construction phase of this project. Impacts would include flows through the underdrains being diverted following construction of the new underdrains as well as the potential construction/sediment runoff causing minor impacts to water quality within aquatic resources. Vegetation removal and grading would be required for the underdrain replacements, creating temporary to short-term, minor effects on aquatic and terrestrial species. This work would be completed concurrently with canal realignment/lining and is anticipated to occur over several years.

5.5.3 Action Alternative (Alternative 3 – Canal Modernization, Reshape)

The impacts due to Alternative 3 are similar to Alternative 2, except Alternative 3 does not involve the direct and indirect effects associated with the geosynthetic lining. Under Alternative 3, terrestrial species' movements across or within the canal would not be affected by a liner. Alternative 3 would be anticipated to have greater seepage along the first 9 miles of the canal with the absence of the liner. This may indirectly benefit riparian and wetland areas adjacent to the canal that remain or reestablish after construction compared to lining the canal. Benefits to the riparian and wetland areas may also provide indirect benefits to fish and aquatic species as well due to the increased water availability to these resources. As such, the effects on species would be slightly lower with Alternative 3 and include only minor, permanent effects. Additionally, benthic habitat impacted by the geosynthetic canal lining would not occur to the extent of Alternative 2.

5.6 Historic Properties and Cultural Resources

Under 36 CFR 800.5, adverse effects on historic properties are found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative. Examples of adverse effects can include physical destruction and/or damage to a property; alteration (including rehabilitation, repair, and maintenance); changes to the character of the property's physical features or use within the setting if it contributes to the historical significance of the property; the introduction of visual, audible, or atmospheric elements that diminish the property's integrity; or neglect that causes deterioration.

5.6.1 No-Action Alternative (Alternative 1 – FWOFI)

Historic properties and cultural resources would not be affected under the No-Action Alternative. Work in the study area would not be completed; therefore, no disturbances would occur.

5.6.2 Action Alternative (Alternative 2 – Canal Modernization, Lined/Reshape)

Applying the Criteria of Adverse Effect (36 CFR 800.5), NRCS Montana has determined that modernization of the St. Mary Canal System (24GL0155) under Alternative 2 of the Plan-EIS would result in adverse effects on those characteristics that qualify the historic property for inclusion in the NRHP. Specifically, the removal, replacement, or abandonment of structural features such as the Kennedy Creek Siphon, Drop Structures, and wasteways would adversely affect aspects of design, workmanship, and materials that are associated with 24GL0155. Similarly, lining or reshaping the canal would additionally affect aspects of location if the course were significantly altered.

Sites 24GL1166, 24GL1168, 24GL1169, 24GL1170, 24GL1172, 24GL1173, and 24GL1179 would be adversely affected by the proposed canal reshaping and possible lining. Each of these sites possesses surface artifacts and features immediately adjacent to the canal as well as subsurface archaeological deposits exposed in the canal wall and floor. Reshaping or lining of the canal corridor would destroy or severely impact these deposits during construction.

As noted previously, NRCS Montana is currently working with the consulting parties for this undertaking to develop a PA outlining a phased approach for further identification, evaluation, and treatment of historic properties for this undertaking. Coordination with the consulting parties is discussed in Section 3.6. The PA will outline the process for resolving adverse effects for these known historic properties and will outline the process for further identification and treatment of historic properties associated with this undertaking.

5.6.3 Action Alternative (Alternative 3 – Canal Modernization, Reshape)

Alternative 3 would have similar impacts on historic properties and cultural resources as Alternative 2, with the same footprint and disturbance corridor. The difference between the Alternatives is the canal lining, which would not change construction impacts.

5.7 Visual Resources

5.7.1 No-Action Alternative (Alternative 1 – FWOFI)

Potential system failure is more likely to occur under the No-Action Alternative and could cause impacts on visual resources and aesthetic viewsheds. The visual impacts on the project area would be temporary until emergency rehabilitation occurred. If rehabilitation were not completed, the impacts could be permanent. This could affect tourism temporarily during emergency construction and permanently if the system is not repaired.

5.7.2 Action Alternative (Alternative 2 – Canal Modernization, Lined/Reshape)

Lining and Reshaping

Lining and reshaping the canal would change the current typical section, creating more uniform banks and slopes. Under Alternative 2, the first 9 miles of the canal would include a geosynthetic liner. This liner would be overlaid on the earthen material the canal is currently shaped with and would be likely to cause a slight visual difference from the existing earthen material. The liner would extend approximately 2 feet on either side of the canal. This liner may make it more difficult for past vegetation communities to reestablish fully. Vegetation is anticipated to return to most areas where earth work would occur; however, the vegetation community may differ from preconstruction.

In forested areas, trees would not be replanted and would be reestablished as grasslands creating a permanent impact on the viewshed along this portion of the St. Mary Canal System. During the maintenance of the St. Mary Canal System after construction of Alternative 2, replanting tree species in areas within/near the geosynthetic liner, in areas with heavy tree coverage prior to construction, would not be encouraged. This lack of tree cover would have a minor to moderate, permanent impact due to the small area, approximately 2 feet on either side of the canal.

The overall reshaping of the canal under Alternative 2 may be visible from Glacier National Park, Highway 89, and Highway 17 north of Babb, MT, as well as other local roadways, the O&M roadway, USFWS waterfowl production areas in the vicinity, and some camping and short-term stay locations, such as Glacier Elkhorn Cabins/Campground, Piegan Crossing RV Park/Campground, Paul Ranch, and Hook's Hideaway (see Table 5-10). These modifications are anticipated to have negligible to moderate, permanent effects on the visual resources in the area; however, they are not anticipated to impact the overall viewshed significantly within the area.

Temporary impacts during construction would be visible from public roadways, residences, waterfowl production areas, and other recreational areas previously noted within the vicinity of the project. These impacts are likely to have minor, temporary effects throughout the duration of construction. Construction work along the canal, including lining, is anticipated to be completed in segments taking several years. Construction work would tentatively be completed each year between the months of March and November, weather dependent. Construction on this piece of the St. Mary Canal System would begin on the west end, and an estimated 4 to 5 miles would be completed each year. Vegetation would be reestablished following construction in all disturbed areas possible, per NPDES requirements.

Table 5-10. Potential Visual Receptors of Impacts

Location	Distance from Canal	Project Features Potentially Visible from Location	Views between the Project and the Location	Notable Views Beyond the Project from the Location
Leaning Tree Café and Campground	< 1 mile	N/A	Dense trees	Mountain peaks associated with Glacier National Park
Glacier Elkhorn Cabins and Campground	0.5 mile	Canal conveyance, O&M road, Kennedy Siphon, wasteway	Kennedy Creek, heavily wooded area, and open grassland	Rolling hills and St. Mary River valley
Piegan Crossing RV Park and Campground	< 0.75 mile	Canal conveyance, O&M road, Kennedy Siphon, wasteway	Open grassland and Kennedy Creek	Rolling hills and St. Mary River valley
Paul Ranch	< 0.5 mile	Canal conveyance, O&M road, Kennedy Siphon, wasteway	Open grassland	Rolling hills and St. Mary River/river valley
Hook's Hideaway	< 0.25 mile	St. Mary Siphon and O&M road	St. Mary River	Chief Mountain and other peaks associated with Glacier National Park
Highway 89	< 0.25 mile	Canal conveyance, O&M road, wasteways, culvert, drain	Open grasslands, heavily wooded areas, Kennedy Creek,	Rolling hills and St. Mary River/river valley

Location	Distance from Canal	Project Features Potentially Visible from Location	Views between the Project and the Location	Notable Views Beyond the Project from the Location
Local Roads/O&M Road	< 0.25 mile	All project features	Open grasslands, heavily wooded areas, Kennedy Creek, wetlands, St. Mary River, North Fork Milk River	Rolling Hills, mountain peaks associated with Glacier National Park, Kennedy Creek, St. Mary River/river valley, Spider Lake

Siphon Modification

Impacts associated with siphon modification would be similar to those listed in Alternative 2, Lining and Reshaping, and would also occur during the months of March through November during the first and second years of construction. In addition, the siphon modification would be visible from several campgrounds and short-term stay locations as well as local roadways (such as Highway 89 and the O&M roadway). The additional RCB structure planned to be constructed is expected to cause minor permanent visual impacts to the area. Overall, siphon modification is anticipated to have minor, permanent impacts to visual resources.

During construction, grading/cut/fill activities and the presence of construction crews and heavy machinery are likely to cause minor to moderate, temporary impacts on visual resources at short-term stay locations, from portions of local roadways, and portions of USFWS waterfowl production areas.

Drop Structure Replacement

Impacts associated with Drop Structure replacement under Alternative 2 would cause negligible to minor, permanent impacts on visual resources within the study area. Drop Structure replacements would be shifted slightly from the current alignment, causing minor amounts of land conversion. These impacts are not anticipated to impact the overall visual landscape of the area and are unlikely to be visible to the public, aside from anyone using the O&M roadway or wildlife viewing at the Glacier County Waterfowl Production Area, due to the remote nature of the Drop Structures.

Minor, temporary visual impacts are anticipated with the construction of these Drop Structures. Impacts would include earth work/grading and the presence of construction crews and equipment. Temporary impacts are unlikely as Drop Structure replacement activities are unlikely to be visible from residential properties, recreational/short-stay areas, or local roadways (aside from the O&M road). These impacts would occur tentatively between the months of April and November.

Slope Stability (Slide Mitigation)

Earth work under Alternative 2 is anticipated to create minor, temporary impacts on visual resources within the study area, and these areas of ground disturbance may be visible from

several local roadways, including the O&M roadway. Slope stability requires soil to be moved from slide areas and deposited in other areas along the canal, causing these impacts. Areas of additional grading and mitigation may experience temporary impacts caused by earth work and the presence of construction crews and heavy machinery. Temporary visual impacts may occur along local roadways (including the O&M roadway), within or near USFWS waterfowl production areas, and potentially near some rural residential parcels. Slide mitigation work is anticipated to take 1 year, with construction occurring between April and November.

O&M Road Improvements

The segments of O&M roadway that are anticipated to be improved total 172,025 feet, which is approximately 32.7 miles (Table 5-4). Approximately 59 acres of temporary impacts are anticipated to occur outside of the existing ROW. Impacts are likely to include earth work/grading, vegetation removal, and tree trimming in some locations. Realignment of a few small segments of the O&M roadway would cause minor, permanent impacts on the visual landscape of the area. Grading associated with O&M road improvements would likely cause long-term impacts along the existing roadways due to necessary earth work, including approximately 15 acres of permanent impacts outside of the existing ROW. Minor permanent impacts are anticipated within portions of USFWS' Glacier County Waterfowl Production Area; however, they are not anticipated to impact the overall use of these areas.

Short- to long-term impacts associated with vegetation removal along the roadways are expected. Construction work is planned to occur as needed throughout the construction period for this Alternative to complete other portions of the project, with roadway specific construction occurring between March and November of construction year 12. Temporary impacts would likely be associated with grading and the general presence of heavy machinery and construction crews. Impacts are likely to be visible from roadways, campgrounds, and short-term stay locations within the vicinity of the canal and would be similar to impacts discussed in Alternative 2, Lining and Reshaping. This may cause temporary, negative impacts on scenic beauty in some locations where construction is visible from the viewshed. Reclamation along the roadway would be completed following construction, where possible, including reseeding disturbed areas to minimize long-term impacts.

Wasteways, Spillways, and Drains

Some vegetation removal may be required in the vicinity of the wasteways, spillways, and drains and may cause minor, long-term impacts. Vegetation removal and earth work directly around the wasteways, spillways, and drains are anticipated to cause minor, permanent impacts. Many of the long-term impacts associated with these project elements are unlikely to impact viewsheds from local roadways (excluding the O&M roadway), residential properties, or recreational/short-stay locations due to their more remote nature.

Temporary impacts are anticipated during replacement due to grading and other ground disturbance. Other temporary visual resource impacts would include the presence of heavy machinery and construction crews at these locations. These temporary impacts would occur concurrently with the Lining and Reshaping improvements. Depending on the location along the

canal, wasteways, spillways, and drains would be improved between March and November of construction years 6 through 11.

Underdrains (Culverts)

Underdrain replacement would have impacts similar to those listed in Alternative 2, Lining and Reshaping. Due to the in-kind nature of the replacements, impacts would be minor and temporary. Impacts caused by these replacements are unlikely to have more than minor impacts on visual resources in the project vicinity. Similar to wasteways, spillways, and drains, improvements would be made between March and November of construction years 6 through 11, depending on the underdrain's location along the canal.

5.7.3 Action Alternative (Alternative 3 – Canal Modernization, Reshape)

Visual impacts associated with Alternative 3 would be similar to those detailed in Alternative 2, other than additional earth work (fill) would be required with Alternative 3. The additional earth work may cause a minor, temporary additional effect on visual resources compared to Alternative 2. Impacts on ecosystem services would be the same as Alternative 2.

5.8 Public Safety

5.8.1 No-Action Alternative (Alternative 1 – FWOFI)

Under the No-Action Alternative, the main risks to public safety from the St. Mary Canal System include flooding and drowning.

Under the No-Action Alternative, the St. Mary Canal System would continue to degrade. With continued degradation, the chances of a potential system failure would increase. A potential system failure could be similar to the Drop Structure 5 failure in 2020. The largest potential impact on safety due to a system failure would be flash flooding of the adjacent land. Flash flooding would be considered especially dangerous in areas of the St. Mary Canal System near residential dwellings, campgrounds, and roadways.

Under the No-Action Alternative, the degraded banks would not be improved, and drowning risks would remain. The instability of the banks and slopes could cause an animal or member of the public to fall into the canal and possibly have difficulties being able to leave the canal.

The No-Action Alternative would result in permanent moderate impacts on public safety in the project area. No impact would occur in the service area.

5.8.2 Action Alternative (Alternative 2 – Canal Modernization, Lined/Reshape)

Lining and Reshaping

Lining and reshaping would create a stable typical section throughout the canal, thus decreasing the potential for bank erosion. Unstable banks directly along the canal increase the

likelihood of landslides. This proposed alternative would reduce the risks of flash flooding of property adjacent to the canal and the subsequent losses associated with such an event (e.g., property damage, property loss, loss of life). While the risk of a canal breach and subsequent flash flooding is reduced under this alternative, the potential magnitude of a flash flood would be greater than under the No-Action Alternative due to the increase in flow capacity.

The reshaping of the canal may decrease the chances of the public falling into the canal due to unstable banks but is not anticipated to impact the overall risk of drowning. Under this alternative, the typical water depth during peak irrigation season would vary. Maximum water depth of the canal after improvements would be 9.2 feet. The lined portion of the canal is anticipated to have a shallower flow depth by approximately 2 feet compared to Alternative 3. Depending upon the geosynthetic liner selected, this could make it more difficult for animals and the public to leave the canal once they have fallen in. At the time of this report, no concerns over public safety have been raised by residents, landowners, or other parties within vicinity of the canal (Chapter 6). Alternative 2 would have a permanent benefit for reducing flash flooding risk, with a negligible to minor effect on drowning risks for animals and the public.

Temporary impacts under lining and reshaping may include minor increased risk of vehicle collisions within the project vicinity due to increased construction traffic, potential detours or road closures, and presence of large machinery. Traffic control plans would be created in consultation with Glacier County, the Blackfeet Tribe, and emergency services within the area prior to construction. Construction sites would be closed to the public and are unlikely to pose a risk to public safety.

Siphon Modification

Impacts related to siphon modification would be similar to those listed in Alternative 2, Lining and Reshaping. Improvements to the siphon area would include signage/safety markings to block access to the public. An additional minor to moderate permanent benefit of siphon modification would be the decreased risk of catastrophic failure, which has the potential to cause flash flooding to adjacent properties.

Drop Structure Replacement

Impacts would be similar to those listed in Alternative 2, Lining and Reshaping.

Slope Stability (Slide Mitigation)

Impacts would be similar to those listed in Alternative 2, Lining and Reshaping.

O&M Road Improvements

O&M road improvement impacts would be similar to those listed in Alternative 2, Lining and Reshaping. In addition, O&M road improvements would create a safer roadway during inclement weather conditions throughout the year, such as during heavy precipitation events. Widening sections of the roadway would increase safety for rural traffic and maintenance crews who may use the roadway.

Wasteways, Spillways, and Drains

Improvements to the canal would allow flow rates to reach 850 cfs, as originally designed. The risk of a system breach would always be possible if proper O&M is not practiced. However, improvements to wasteways, spillways, and drains would assist in reducing breaches and the risk of exacerbating emergencies along the St. Mary Canal System by allowing controlled releases of water from the canal when warranted. Water accumulating or flowing through soil can cause instability. Improving the ability to release excess water from the canal is important to minimize soil instability along the canal. This is especially important during times of heavy precipitation, which are known to cause shifts in unstable soils. Improvements would have moderate, permanent impacts on unstable soils and decrease the risk of impacts, such as landslides, which can cause potential system failure and flash flooding. Improvements would have moderate, permanent benefits on the O&M staff's ability to release water when needed, reducing the risk of system breaches/failures, flash flooding, and landslides.

Underdrains (Culverts)

Replacing the underdrains (culverts) would benefit the area by removing excess water from lands adjacent to the canal during high precipitation events. Removing this water from adjacent lands would prevent excess runoff from entering the canal along the conveyance route. Removal of this water helps prevent system breaches and improves soil stability, decreasing the chance of landslides that can cause flash flooding and other complications that may impact the public or nearby residences/properties.

In summary, Alternative 2 would have temporary minor adverse impacts on public safety in the project area during construction. Following construction, permanent minor to moderate beneficial impacts would occur. No impact on public safety would occur in the service area.

5.8.3 Action Alternative (Alternative 3 – Canal Modernization, Reshape)

Impacts on public safety would be similar to those listed under Alternative 2, aside from additional impacts associated with lining and reshaping. Under Alternative 3, the first 9 miles of the canal would be approximately 2 feet deeper than Alternative 2 and would not include the geosynthetic liner. The increased canal depth and lack of liner may have minor impacts on public safety over the long-term; however, these impacts are not anticipated to be significant.

5.9 Socioeconomic Resources

5.9.1 No-Action Alternative (Alternative 1 – FWOFI)

No Action

Local and Region Economy

In the event of a system failure, impacts on the local economy adjacent to the canal could occur due to system failure causing a flash flood. Flooding of residential properties, cropland, roadways, and other infrastructure could occur, depending on the system failure's location. This

flooding could cause costly damage to homes and crops. Roadways and other infrastructure damaged by flash flooding would likely cost local taxpayers and/or the irrigation district money to repair or replace and could temporarily impact daily life due to downed communications, impeded roadways, or other flash flooding impacts.

An economic analysis was completed for this project, including a calculation for increased water conveyance (see Appendix D5). The analysis determined the value of water for consumptive purposes including irrigation and M&I users that are downstream of the Fresno Reservoir. Under the No-Action Alternative, the current reduced water conveyance, 600 to 650 cfs compared to 850 cfs, equated to approximately 21,538 to 28,322 AF/year. The loss to beneficiaries is discussed in Appendix D5. This loss would remain under this alternative.

Additional impacts on the regional economy under the No-Action Alternative are largely dependent on the possibility of a potential system failure. The annual probability of failure within the canal's system ranges from 30 to 100 percent, depending on the St. Mary Canal System component that fails (e.g., siphon, drops, underdrain) (see Appendix D5). A system failure would affect the service area and Milk River Project beneficiaries, and a significant water supply issue would ensue (Reclamation 2023). A closure of the St. Mary Canal System would be required in the event of a system failure, and repairs could last anywhere from 0.5 month to 24 months, depending on the failure type. Potential delays in water delivery caused by these closures could cause minor to major, permanent impacts on annual crop yields for the region. However, if the St. Mary Canal System was rehabilitated, crop harvest would return after normal flows were restored. A system failure would likely cause a decrease in the amount of water available for municipal uses (see Appendix D5). The No Action Alternative would likely have permanent, moderate to major, adverse impacts on minority and low-income populations within the project area. The service area would have potential permanent moderate to major adverse impacts on all populations under this alternative.

5.9.2 Action Alternative (Alternative 2 – Canal Modernization, Lined/Reshape)

Lining and Reshaping

Local and Regional Economy

Lining and reshaping the canal would have a beneficial effect on the local economy by increasing water conveyance and enhancing reliability to the Milk River Project beneficiaries. Under Alternative 2, an additional 250 cfs would be diverted into the canal leading to an additional 28,322 AF/year being delivered. This increase in water delivery would lead to a benefit to the economy within the service area (see Appendix D5).

Increased water delivery and reliability would have a positive impact on recreation/tourism downstream at locations such as Fresno and Nelson Reservoirs. Under Alternative 2, an additional 1,205 anglers would be expected to visit Fresno Reservoir annually. The total number of additional annual visitors to the two reservoirs (anglers and other users) would be 1,958 more under Alternative 2 than under the No-Action Alternative. The recreation day value has been

determined to be $48.60 per visitor at the Fresno and Nelson Reservoirs. The total recreational benefits of increased water conveyance under Alternative 2 would be approximately $32.7 million (see Appendix D5).

During construction, a temporary increase in business foot traffic at locations such as gas stations and dining establishments may occur during typical business hours due to the presence of construction crews within the area. The project would bring additional temporary employment to the area due to a need for construction crews to complete the work. Some long-term positions may be required to complete this large-scale project and could last several years. This alternative may have minor impacts on overall tourism traffic within and adjacent to the project area due to impacts on landscapes and viewsheds. Impacts may be felt by local business owners, such as short-term stay locations within proximity to construction sites, as workers on the project would need accommodations.

A minor, temporary decrease in overall tourism traffic may occur within the project area due to detours or road closures that may be required for construction and due to impacts on landscapes and viewsheds. Short-term stay locations within the vicinity of construction activities may see a temporary drop in patrons during the construction phase due to noise and visual impacts. During construction, workers may need to stay at the available locations, which may take away from tourists staying in the area.

Overall, the service area and the regional economy is expected to experience benefits related to increased water delivery and reliability of the St. Mary Canal System.

Siphon Modification

Local and Regional Economy

Impacts on the local and regional economy are anticipated to be the same as those described in Alternative 2, Lining and Reshaping. Without improvements, the probability of a siphon failure reaches 100 percent between 2038 and 2043. A siphon failure would be more likely to occur under Alternative 1 and could take 18 to 24 months to repair. This would require a shutdown of water conveyance through the canal during this time (see Appendix D5).

Drop Structure Replacement

Local and Regional Economy

Impacts are anticipated to be similar to those discussed in Alternative 2, Lining and Reshaping. Drop Structure replacement would benefit the local and regional economy by decreasing the risk of a catastrophic failure, which could cause flash flooding and insecure water delivery within the region. A Drop Structure failure is estimated to take 4 to 5 months to repair and would result in a shutdown of water conveyance if the failure were to occur during irrigation months. The net benefits of improvements to Drop Structures are discussed in Appendix D5.

Slope Stability (Slide Mitigation)

Local and Regional Economy

Impacts on the local and regional economy would be similar to those discussed in Alternative 2, Lining and Reshaping. Compared to the No-Action Alternative, improvements to slope stability under Alternative 2 would provide an annualized benefit of approximately $12.9 million in water delivery benefits. Under Alternative 2, a month-long canal closure period for repairs following a slope stability failure would likely be avoided compared to the No-Action Alternative.

O&M Road Improvements

Local and Regional Economy

Impacts on the local and regional economy would be similar to those discussed for Alternative 2, Lining and Reshaping. A structural failure repair could be delayed an additional 2 to 3 months without improvements to O&M roads that would be provided by Alternative 2. The value of avoided loss of water delivery benefits due to maintenance road improvements was calculated in Appendix D5.

Wasteways, Spillways, and Drains

Local and Regional Economy

Impacts on the local and regional economy would be similar to those discussed in Alternative 2, Lining and Reshaping. Improvements to wasteways and spillways under Alternative 2 would increase the ability to repair infrastructure along the St. Mary Canal System in the event of a failure, improving overall repair timelines by 1 to 2 months.

Underdrains (Culverts)

Local and Regional Economy

Impacts on the local and regional economy would be similar to those discussed in Alternative 2, Lining and Reshaping. Improvements to underdrains is anticipated to decrease the chances of a required St. Mary Canal System shutdown to repair failed underdrains, which can take one month.

5.9.3 Action Alternative (Alternative 3 – Canal Modernization, Reshape)

Impacts associated with Alternative 3 would be the same as those outlined for Alternative 2, other than a difference in economic benefits. The economic benefits associated with each portion of Alternative 3 are outlined below. Under Alternative 3, the additional diverted water into the canal leading to an additional 21,538 AF/year being delivered downstream. This increase in water delivery leads to a $366 million-dollar benefit.

Increased water delivery and reliability are likely to positively impact recreation/tourism downstream at locations such as Fresno and Nelson Reservoirs. Benefits of Alternative 3 would be slightly lower than Alternative 2 because of the smaller increase in delivered water. Under Alternative 3, an additional 916 anglers would be expected to visit Fresno Reservoir annually,

and an additional 201 anglers would be expected at Nelson Reservoir. The total number of additional annual visitors to the two reservoirs (anglers and other users) would be 1,117 more under Alternative 3 than under the No-Action Alternative. The recreation day value has been determined to be $48.60 per visitor at the Fresno and Nelson Reservoirs. The total recreational benefits of increased water conveyance under Alternative 3 would be approximately $27.3 million (see Appendix D5).

5.10 Ecosystem Services

Provisioning Services, Regulating Services, and Cultural Services would be impacted by Alternative 1, Alternative 2, and Alternative 3. A discussion of the tradeoffs for each of the services is provided below.

Provisioning Services

Alternative 1, the No-Action Alternative, would continue to provide unreliable irrigation and municipal water supply. Negative impacts on fish species in the North Fork Milk River and Milk River would continue due to water availability and the system's inability to support fish species.

Alternative 2 modernization measures would help provide more secure and reliable irrigation and municipal water supply and would provide a beneficial effect on fish species within the North Fork Milk River and Milk River by increasing the canal discharge rate to the original design capacity of 850 cfs. A minor adverse effect on fish species within the St. Mary River downstream of the diversion point is anticipated due to the acclimation to a discharge rate of 600 to 650 cfs and the increase to 850 cfs.

Alternative 3 modernization measures would provide a secure and reliable irrigation and municipal water supply and would provide a beneficial effect on fish species within the North Fork Milk River and Milk River by increasing the canal discharge rate to the original design capacity of 850 cfs. A minor adverse effect on fish species within the St. Mary River downstream of the diversion point is anticipated due to the acclimation to a discharge rate of 600 to 650 cfs and the increase to 850 cfs.

Regulating Services

Alternative 1 would have no effect on existing water quality, and it would remain unchanged.

Alternative 2 would have a temporary, short-term, negligible effect on water quality from construction and a long-term, minor, beneficial effect on water to waterbodies that receive Milk River Project water.

Alternative 3 would have a temporary, short-term, negligible effect due to construction and a long-term, minor, beneficial effect on water quality to waterbodies that receive Milk River Project water.

Cultural Services

Alternative 1 would moderately impact recreation due to the reduced water levels in the Fresno Reservoir. This Alternative would have no impact on landscapes, landforms, and traditional use areas of cultural significance. These resources would remain unchanged.

Alternative 2 would result in a minor beneficial impact on recreational activities at Fresno Reservoir. Water levels would increase and be more consistent for recreational use. Alternative 2 would result in minor impacts on landscapes and landforms. Lining and reshaping the canal and O&M roadway improvements would result in temporary impacts during construction, and it would result in detectable visual impacts on the landscape. However, these impacts would not diminish the cultural significance of the landscape and associated landforms for the Blackfeet Nation. Similarly, Alternative 2 would have minor impacts on traditional use practices along the canal. Increased flow rates in the canal and changes to seepage levels would impact the availability and distribution of plant and animal resources. This would result in minor impacts on traditional practices or subsistence activities.

Alternative 3 would have similar impacts on Cultural Services as Alternative 2, with the same footprint and disturbance corridor. The difference between the Alternatives is the canal lining, which would not change construction impacts.

Summary of Impacts

Table 5-11 shows a summary of the impacts from the environmental consequences analysis for Alternatives 1, 2, and 3.

Table 5-11. Summary of Impacts Due to Alternatives

Environmental Category	No-Action Alternative	Alternative 2 (Canal Modernization, Line/Reshape)	Alternative 3 (Canal Modernization, Reshape)
Land Use and Farmland	-	-	-
Substantially altering existing land use of an area?	Project area: None Service area: Moderate to major adverse permanent impacts on irrigated croplands	Project area: Minor to moderate adverse temporary and permanent impacts associated with construction and on lands currently affected by seepage Service area: Moderate to major beneficial permanent impacts on agricultural lands	Project area: Minor to moderate adverse temporary and permanent impacts associated with construction Service area: Moderate to major beneficial permanent impacts on agricultural lands

Environmental Category	No-Action Alternative	Alternative 2 (Canal Modernization, Line/Reshape)	Alternative 3 (Canal Modernization, Reshape)
Impacts on parks or recreational areas?	Project area: Minor temporary adverse impacts Service area: Minor to moderate permanent adverse impacts	Project area: Minor temporary adverse impacts associated with construction activities Service area: Minor to moderate permanent beneficial impacts	Project area: Minor temporary adverse impacts associated with construction activities Service area: Minor to moderate permanent beneficial impacts
Impacts on farmland?	Project area: Moderate temporary impact Service area: Moderate to major permanent adverse impact	Project area: Minor adverse impact Service area: Moderate to major permanent beneficial impact	Project area: Minor adverse impact Service Area: Moderate to major permanent beneficial impact
Soil Resources	-	-	-
Impacts on erosion?	Project area: Minor to major adverse impact Service area: Minor to major permanent adverse impact	Project area: Minor adverse, temporary impact and minor to major permanent, beneficial impact Service area: Moderate to major permanent beneficial impact	Project area: Minor adverse, temporary impact and minor to major permanent, beneficial impact Service area: Moderate to major permanent beneficial impact
Water Resources	-	-	-
Change quality of water resources?	Project area: Minor permanent adverse impact Service area: Permanent negligible impacts	Project area: Minor adverse temporary impacts during construction; minor to moderate adverse and beneficial permanent impacts	Project area: Minor adverse temporary impacts during construction; minor to moderate adverse and beneficial permanent impacts
Change quantity of water?	Moderate to major adverse impact	Project area and service area: Temporary minor adverse impact during construction Service area: Permanent moderate to major beneficial impact following completion of construction	Project area and service area: Temporary minor adverse impact during construction Service area: Permanent moderate to major beneficial impact following completion of construction

Environmental Category	No-Action Alternative	Alternative 2 (Canal Modernization, Line/Reshape)	Alternative 3 (Canal Modernization, Reshape)
Impact on wetlands?	Project area: No impact Service area: No impact	Project area: Minor to moderate adverse temporary impacts and moderate adverse permanent impacts Service area: No impact	Project area: Minor to moderate adverse temporary impacts and moderate adverse permanent impacts Service area: No impact
Impact on recharge area or rate?	Project area: No impact Service area: No impact	Project area: Negligible temporary and permanent impacts Service area: No impact	Project area: Negligible temporary and permanent impacts Service area: No impact
Terrestrial and Aquatic Species	-	-	-
Change in diversity or productivity of vegetation?	Project area: Minor beneficial impact	Project area: Minor permanent adverse impacts	Project area: Minor permanent adverse impacts
Impact on wildlife habitat and nesting areas?	Project area: Temporary minor to moderate beneficial and adverse impacts Service area: Permanent minor to moderate adverse impacts	Project Area: Minor to moderate permanent and long-term adverse impacts. Temporary adverse impacts during construction Service area: Minor permanent beneficial impacts	Project Area: Minor to moderate permanent and long-term adverse impacts. Temporary adverse impacts during construction Service area: Minor permanent beneficial impacts
Impact on migratory birds?	Minor adverse impact	Project area: Minor to moderate, temporary to permanent, adverse impacts	Project area: Minor to moderate, temporary to permanent, adverse impacts
Impact on fisheries and aquatic species?	Project area: Temporary minor to moderate beneficial impacts Service area: Temporary to permanent minor to moderate adverse impacts	Project area: Permanent minor to moderate adverse impact Service area: Long-term, minor beneficial impacts	Project area: Permanent, minor adverse impact Service area: Long-term, minor beneficial impacts

Environmental Category	No-Action Alternative	Alternative 2 (Canal Modernization, Line/Reshape)	Alternative 3 (Canal Modernization, Reshape)
Historic Properties and Cultural Resources	-	-	-
Impacts on archeological or cultural sites?	Project area: No impact, except in the case of canal system failure Service area: No impact	Project area: Adverse effect determination under Section 106 Service area: No impact	Project area: Adverse effect determination under Section 106 Service area: No impact
Visual Resources	-	-	-
Effect on visual resources?	Project area: No impact, except in the case of canal system failure Service area: No impact	Project area: Temporary minor adverse impact during construction; permanent negligible to moderate adverse impacts Service area: No impact	Project area: Temporary minor adverse impact during construction; permanent negligible to moderate adverse impacts Service area: No impact
Public Safety	-	-	-
Effect on public safety?	Project area: Permanent moderate adverse impacts Service area: No impact	Project area: Temporary minor adverse impacts; permanent minor to moderate beneficial impacts Service area: No impact	Project area: Temporary minor adverse impacts; permanent minor to moderate beneficial impacts Service area: No impact

Environmental Category	No-Action Alternative	Alternative 2 (Canal Modernization, Line/Reshape)	Alternative 3 (Canal Modernization, Reshape)
Socioeconomic Resources	-	-	-
Affect vulnerable populations?	Project area: Permanent moderate to major adverse impacts on minority and low-income populations Service area: Permanent moderate to major adverse impacts on all populations, including vulnerable populations	Project area: Permanent moderate to major beneficial impacts and temporary minor beneficial and adverse impacts Service area: Permanent moderate to major beneficial impacts. Permanent impacts on minorities and low-income populations would not be disproportionate compared to other populations.	Project area: Permanent moderate to major beneficial impacts and temporary minor beneficial and adverse impacts Service area: Permanent moderate to major beneficial impacts. Permanent impacts on minorities and low-income populations would not be disproportionate compared to other populations.

5.11 Cumulative Effects

NEPA (40 CFR 1500-1508) requires that cumulative effects of a proposed action be assessed. Cumulative effects could be additively beneficial or adverse to a resource. Cumulative effects could result from individually minor but collective actions that take place over time.

Accordingly, a cumulative effects analysis identifies and defines the scope of other actions and their interrelationship with the project's alternatives if there is an overlap in space and time. Cumulative effects are most likely to occur when there is an overlapping geographic location and a coincidental or sequential timing of events. Because the environmental analysis required under NEPA is forward-looking, the aggregate effect of past actions is analyzed to the extent relevant and useful in analyzing whether the reasonably foreseeable effects of a proposed action could have a continuing, additive, and significant effect on the resource.

5.11.1 Past Actions

For the cumulative effects analysis, the resources on which the proposed action has a potential to have an adverse effect were considered. For each resource affected, the proposed action's estimated effect on the resource was considered with past, present, and reasonably foreseeable actions. Based on the analysis within this Plan-EIS, the following resources were included in the cumulative effect analysis:

- Land use
- Water resources

- Terrestrial and aquatic wildlife
- Historic properties and cultural resources
- Visual resources
- Socioeconomic resources
- Ecosystem services

5.11.2 Current and Reasonably Foreseeable Future Actions

Table 5-12 lists the past, present, and reasonably foreseeable actions considered for cumulative effects analysis. Each is discussed further in the following sections. These actions include baseline conditions known for the area and projects or actions that are known to occur within the area that are unrelated to the proposed action.

Table 5-12. Present and Reasonably Foreseeable Actions Considered for Cumulative Effects.

Action	Proponent	Description	Status
Milk River Project – St. Mary Unit	Reclamation	Proposed operation and maintenance of the St. Mary Unit; current project is the reconstruction of the diversion dam and fish protection structure that would comply with ESA	Present and future
Fresno Dam Improvements	Reclamation	Current construction to upgrade the Fresno Dam	Present and future
St. Mary Siphon Construction	Reclamation and MRJBOC	Remediation and initial construction to address the St. Mary Siphon failure	Present and future
Halls Coulee Siphon Design and Construction	Reclamation and MRJBOC	Remediation and initial construction to address the Halls Coulee Siphon	Present and future
Grassland Practices	Individual Landowners and Tribe	Pastureland	Present throughout the watersheds
Blackfeet Water Right Project	Reclamation and Blackfeet Tribe	Project to meet the Blackfeet water right from the St. Mary River	Present and future
Creating Blackfeet National Park	Blackfeet Tribe	Conserve land within 10 miles of Glacier National Park and the Helena-Lewis and Clark National Forest (Blackfeet Nation 2018b)	Reasonably foreseeable; no determined timeline
Cropland Production	Blackfeet Tribe	Upgrade irrigation systems and encourage crop diversification (Blackfeet Nation 2018b)	Reasonably foreseeable; no determined timeline

Action	Proponent	Description	Status
Glacier County Snow Fence	Montana Department of Transportation	Snow fence at specific spots on S-464, US-2, and US-89 (Reference 9619) (MDT 2023)	Reasonably foreseeable; Planned in Statewide Transportation Improvement Program 2022–2026

Past Actions in the Area

The area has been inhabited by the Amskapi Pikuni (Blackfeet), the southernmost members of an independent confederation of four Blackfoot warrior Tribes of the Northern Plains. The area was previously undisturbed forest, shrubland, and grassland. As European settlement occurred, the area was transitioned into the Reservation with developed communities and agricultural lands. The cumulative effects of converting natural areas to agriculture, urban, and managed forest land uses have made a pronounced change to hydrology, habitats, habitat connectivity, air emissions, and discharges of pollutants to receiving waters.

The St. Mary Canal System and overall Milk River Project changed the pre-project watershed conditions with the diversion of 850 cfs from the St. Mary River to the Milk River. The flow has decreased over time with the degradation of the system and recent failure events, including Drop Structure 2 and the St. Mary Siphon. The St. Mary and Milk Rivers have had this flow diverted within their watersheds for over 100 years, so the watersheds typically function with these water flow levels.

Transportation systems were constructed, including US-89, which traverses Glacier County north and south. Glacier County and township roads occur throughout the Cumulative Effects Study Area (MDT 2023).

Present Actions in the Area

Agriculture land use is prevalent throughout the Cumulative Effects Study Area, with pastureland being the primary use due to the lack of hydrology for row crops. Most of the pastureland is along the central to eastern end of the canal within shrubland and grassland areas.

Reclamation continues to manage the Milk River Project, which diverts water from the St. Mary River into the canal. Beginning in 2024, Reclamation started to reconstruct the St. Mary Diversion Dam, including the construction of a low-head diversion dam and rock ramp for upstream passage, new headworks structure, canal fish screen, check structure downstream of the fish screen, fish bypass to return fish to the river, O&M and control buildings, and auxiliary features. This would benefit the bull trout, which is a listed species, and improve current fish passage conditions at the diversion dam. Reclamation completes a yearly ESA review of the diversion dam with USFWS. Construction of the Diversion Dam is expected to be completed in 2027.

Starting in 2023, Reclamation began to modify the Fresno Dam. The dam provides vital flood control functions for the Milk River Basin. The spillway faces urgent safety challenges due to structural deficiencies and outdated designs, posing risks of hydraulic jacking and potential dam failure. The ongoing project will modernize the spillway to address safety concerns.

The Blackfeet Tribe has been allocated a 5,000 AF/year water right for the St. Mary River waters underneath the Compact. The Blackfeet Tribe has created a Water Rights Oversight and Implementation Committee that is coordinating with Reclamation to identify the project and infrastructure needed to meet this water right, as well as the intended use.

In June 2024, the St. Mary Siphon failed catastrophically. Upon failure, approximately 150 feet of the south pipe and 500 feet of the north pipe of the siphon were completely displaced from the pipe alignment. The uncontrolled release of water from the broken pipes eroded the foundations of both the north and south pipes on the west side of the St. Mary River. Approximately 300 feet of the north pipe support structures were completely displaced by the flows, and overburden soil was scoured to bedrock leaving an erosional gully in the hillslope up to approximately 20 feet deep. Soil beneath several of the south pipe support structures was eroded away leaving them displaced and badly damaged. In addition, approximately 20,000 cy of sediment was deposited in the St. Mary River. In July 2024, Reclamation issued a FONSI and Final Plan-EA for the St. Mary Siphon and Bridge Replacement, River Restoration, and Halls Coulee Siphon Replacement. Construction for remediation of St. Mary River, the new bridge replacement, and the new siphons has begun with the hopes that construction can be completed in the summer of 2026.

Reasonably Foreseeable Actions in the Area

Agricultural practices in the area would continue.

The Montana Department of Transportation (MDT) has a few locations where snow fence would be installed within the next 4-year Improvement Plan. There would be normal maintenance and improvement planned past the 4-year timeframe. The roadways are existing, and no new roadways are foreseen.

No land use or zoning plans were available for the area, and no known development is planned.

The Blackfeet Tribe's Climate Adaptation Plan noted the desire to create a Blackfeet National Park. The park would conserve land within 10 miles of Glacier National Park and the Helena-Lewis and Clark National Forest (Blackfeet Nation 2018a).

5.11.3 Cumulative Effects by Resource

The cumulative effect analysis reviewed the resources where the project was determined to have adverse effects within the environmental consequences analysis. If the project would have a beneficial effect on the resource, it is not included in this discussion. Refer to the respective resource sections earlier in this chapter for further discussion of these effects. A checklist to

analyze the cumulative effects on resources that have an adverse effect was adapted from NRCS guidance titled “Considering the Cumulative Effects of NRCS Activities” (NRCS 2003).

Land Use

Land use adjacent to the St. Mary Canal System, as well as other roadways, would be affected by maintenance and future infrastructure improvements. No known land use plans indicate that this area would change in use from the current agricultural and recreational uses. The area is an undeveloped, rural area used for agricultural pastureland with recreational opportunities. The project involves modernizing the existing St. Mary Canal System, which has been present since the early 1900s, and is consistent with the existing land use of the area. Therefore, cumulatively, the projects would have negligible to minor long-term effects on land use due to the low direct conversion of the specific areas, while having an overall benefit by maintaining the current land uses of the area.

Water Resources

The Cumulative Study Area reviewed for water resources included the watersheds in which the St. Mary Canal System is located: Lower St. Mary Lakes (090400010304), St. Mary International Border (090400010305), Upper Willow Creek (090400010501), and Middle North Fork Milk River (100500010202).

In the past, wetlands and surface waters have been affected by the St. Mary Canal System, infrastructure such as roadways, constructed detention areas, and agricultural practices. The project would modernize the existing St. Mary Canal System through reshaping with the alternative option of a liner. The access road and additional infrastructure would be part of the project. This, including the other proposed projects, would have effects on wetlands and surface waters in the area.

Wetlands would be affected directly due to the fill and cut activities for the St. Mary Canal System and future roadway projects. These areas would need to be considered under Section 404 of the CWA and EO 11990, potentially requiring permitting and mitigation for the permanent impacts. Mitigation would be either through available on-site or off-site wetland mitigation banks. The mitigation can include restoration of previously drained wetlands or creation of new wetland areas. Mitigation would reduce the effect on the watersheds. The project would reduce the current St. Mary Canal System seepage within the first 9 miles, causing wetland areas to be reduced. In some areas, reshaping would reestablish the bank of the canal and potentially shift the type of wetlands that occur.

Surface waters would be affected with the modernization of the St. Mary Canal System conveying additional diversion quantity. The existing infrastructure is present, and the proposed improvements would be minimal compared to proposing new structures or canals.

The project would reduce erosion occurring from bank failure and prevent future potential system failure, like the Drop Structures. The proposed Blackfeet National Park would create an area that is protected from further development and disturbance. This would create a grassland

area that would provide buffers to streams and wetlands within the area, allowing for a filtering system for pollutants. This filtering, in combination with the reduced erosion from this project, would cumulatively have a beneficial effect on water quality.

Groundwater recharge within bedrock aquifers is not anticipated to change, while unconsolidated aquifers are anticipated to have minor changes due to the reduction in seepage. This project, in conjunction with the other proposed projects, would have minor effects overall on the groundwater. The project is not anticipated to affect adjacent wells that exist and should remain in a zone of influence that is anticipated to be within 0.5 mile of the canal.

Terrestrial and Aquatic Wildlife

The past conversion of natural forest and prairie areas to developed agricultural, industrial, and residential areas has affected terrestrial and aquatic habitats by directly converting habitat and causing habitat fragmentation. Species have adapted to this previous development and conversion, using the existing habitat throughout the Cumulative Effects Study Area.

Wildlife is present throughout the Cumulative Effects Study Area with the present actions, with some fragmentation occurring. Future projects would convert or affect further habitat areas. Overall, within the entire Cumulative Effects Study Area, the habitat area affected would be a small percentage of the total area. The total area affected by the project is a small portion of the surrounding area habitat that extends across Glacier County. As discussed in Section 3.2, the surrounding area has similar land cover to the area that would be affected by this project. The remaining present and future actions would have no to low effect on fisheries. Vegetation within the canal would be removed, altering the fisheries habitat temporarily until regrowth. The more consistent flows resulting from this project may be beneficial to fisheries. Overall, cumulative effects are anticipated to have a minor, adverse effect on wildlife and fisheries.

Historic Properties and Cultural Resources

Historic properties and cultural resources within the Cumulative Effects Study Area are likely to include precontact and historical archaeological sites. A total of 22 archaeological sites have been identified in the project APE through previous investigations, and it is likely that additional archaeological sites are present in the 614.20 acres (49.5 percent) of the APE that has not been inventoried for cultural resources. Some resources may have been affected by past actions, such as canal construction and maintenance. Present and future actions have the potential to affect historic properties and cultural resources, depending on the selected Alternative. Much of the APE has remained undeveloped, and canal modernization has the potential to destroy historic properties in the APE. Therefore, the cumulative effect with past, present, and reasonably foreseeable future actions is considered a moderate, adverse effect.

Socioeconomic Resources

The original construction of the Milk River Canal System, as well as roadways and conversion of land for agricultural practices, are past actions that have occurred on the Blackfeet Tribe Reservation. These actions have affected the community populations present on the Reservation and within the Blackfeet Tribe.

EO 12898, established in 1994, requires any federal action, such as federally funded roadway construction, to consider the environmental and human health effects of federal actions and to achieve environmental protection for all communities. The communities located on the Reservation rely on the canal to provide water and irrigation to livestock and crops. The community populations of this area will likely experience moderate adverse effects during the reconstruction of the damaged canal.

6 Consultation, Coordination, and Public Participation

This chapter summarizes the consultation and coordination processes with other agencies. This chapter also describes the opportunities provided for public participation throughout the planning process, from the initial request to NRCS assistance to preparation of the final Plan-EIS.

6.1 Consultation

This section summarizes the timing, content, and results of required consultations. The consultations are described in the following sections.

6.1.1 USFWS Consultation

Reclamation led the consultation with USFWS for the project per requirements of Section 7 of the ESA. USFWS, NRCS, and Reclamation began early conferencing on the project on July 13, 2022, through a site visit to the action area. On June 26, 2023, NRCS issued a scoping period from June 26, 2023, to August 7, 2023, in which a scoping letter was sent to USFWS. On August 7, 2023, Montana Fish, Wildlife, and Parks submitted a scoping response commenting on the project, including fisheries, wildlife, parks, and outdoor recreation. Further discussion between USFWS, NRCS, and Reclamation occurred on January 30, 2024.

A draft BA is being conducted with USFWS that includes the effect determinations. A BO will be completed with final effect determinations and commitments; both will be incorporated into the Final EIS and ROD.

A summary of Formal Consultation and Determinations under Section 7 of the ESA for the St. Mary Unit to date includes:

- 2020 Effects of Operation and Maintenance of the St. Mary Unit of the Milk River Project
    - May affect, likely to adversely affect bull trout
- 2023 St. Mary Diversion Dam Replacement Project
    - May affect, likely to adversely affect bull trout
- 2024 St. Mary Siphon and Bridge Replacement and River Restoration Project
    - May affect, likely to adversely affect bull trout

6.1.2 Section 106 Consultation

Appendix A6 has a detailed log of the coordination that occurred for Section 106. The following provides an overview:

- Section 106 consultation was initiated on June 27, 2023, with a letter inviting the following:
    - Blackfeet Tribe of the Blackfeet Reservation of Montana
    - Tribal Preservation Officer, Blackfeet Tribe of the Blackfeet Reservation of Montana,
    - Milk River Joint Board of Control
    - U.S. Bureau of Reclamation, Montana Area Office
    - U.S. Bureau of Indian Affairs, Rocky Mountain Region Office
    - U.S. Army Corps of Engineers, Omaha District
- Blackfeet THPO, MRJBOC, Reclamation and USACE accepted the invitation to participate as consulting parties
- On May 10, 2024, coordination occurred with the consulting parties for:
    - Previous cultural resource inventories
    - The proposed APE
    - Determination of National Register eligibility of archaeological sites
    - The determination of project effects for Alternatives 2 and 3 of the Plan-EIS
- The consulting parties concurred with the determination of Adverse Effect for the undertaking.
- On July 18, 2024, a draft MOA and Treatment Plan was sent to the consulting parties for review and further development.
- In August 2025, NRCS ceased further work on the MOA and Treatment Plan based on comments received from a programmatic review by the NRCS National Water Management Center and the NRCS National Headquarters staff. In place of the MOA and Treatment Plan, NRCS began work on a PA in accordance with 36 CFR § 800.14(b).
- In August 2025, NRCS notified ACHP of adverse effects on historic properties from selected project Alternatives and invited its participation as a consulting party. ACHP declined further participation.
- In September 2025, NRCS provided a project update to the consulting parties and requested concurrence for the further development of the PA and revisions to the project

APE that removes construction work at the St. Mary Siphon and Halls Coulee Siphon. The consulting parties provided concurrence in November and December 2025.

- Section 106 consultation is ongoing and will continue through the execution of the PA. After that process is complete, consultation will resume to establish additional identification, evaluation, and treatment efforts for the selected project Alternative.

6.2 Coordination

Continued coordination throughout the project included:

- October 1, 2021 – Coordination with Governor Gianforte requesting continual support of the Office of the Governor to provide assistance to MRJBOC seeking PL 83-566.
- April 10, 2023 – Formal request to Reclamation Montana Area Office inviting the agency to participate in the Plan-EIS as a cooperating or participating agency.
- April 10, 2023 – Formal request to Blackfeet Tribe inviting the Tribe to participate in the Plan-EIS as a cooperating or participating agency.
- July 20, 2023 – Formal request to Montana Department of Natural Resources and Conservation inviting the agency to participate in the Plan-EIS as a cooperating agency.
- July 26, 2023 – Response to formal request from Montana Department of Natural Resources and Conservation accepting invitation to be cooperating agency.
- August 7, 2023 – Response from Montana Fish, Wildlife and Parks commenting on the project, including fisheries, wildlife, parks, and outdoor recreation.
- October 6, 2024 – Request for additional wildlife and threatened and endangered species information from the Blackfeet Nation Fish and Wildlife biologist (no response received).
- August 14, 2025 – Request for additional fisheries data from Montana, Fish, Wildlife and Parks biologist (no response received).
- September 4, 2025 – Request for additional fisheries data from Montana, Fish, Wildlife and Parks GIS coordinator.
- September 8, 2025 – Response from Montana Fish, Wildlife and Parks GIS coordinator, MTFWP does not maintain fisheries data for reservation lands.
- September 12, 2025 – Request for additional fisheries data from Blackfeet Natural Resource Office (no response received).
- October 1, 2025 – Request for additional bird nesting data from Montana, Fish, Wildlife and Parks GIS coordinator.
- October 1, 2025 – Response from Montana Fish, Wildlife and Parks GIS coordinator, MTFWP does not maintain nesting data for reservation lands.

- October 2, 2025 – Request for additional bird nesting data from Blackfeet Nation Fish and Wildlife (no response received).

6.3 Public Involvement

Public scoping meetings were conducted jointly by MRJBOC in partnership with Reclamation and NRCS. The following were the scoping meeting locations, dates, and times:

Babb Public Meeting
July 13, 2023
12:00 p.m. – 1:30 p.m.
Hooks Hideaway Motel
291 Camp Nine Road
Babb, MT 59411

Malta Public Meeting
July 18, 2023
4:30 p.m. – 5:30 p.m.
Great Northern Hotel
2 S 1st Street East
Malta, MT 59538

Havre Public Meeting
July 18, 2023
11:30 a.m. – 12:30 p.m.
Best Western Plus Havre Inn & Suites

Notices were placed in the Phillip County News, The Glacier Reporter, Glasgow Courier, and The Journal News.

6.4 Plan Development and Review

A notice of intent (NOI) to prepare the EIS was published in the Federal Register on Wednesday, June 21, 2023, Volume 88 Number 118 in the Federal Register. See Appendix A1 for the NOI. On June 26, 2023, NRCS issued a scoping period from June 26, 2023, to August 7, 2023. Letters were sent to:

- Blackfeet Nation
- U.S. Bureau of Reclamation
- U.S. Fish and Wildlife Service
- U.S. Army Corp of Engineers
- U.S. Environmental Protection Agency
- International Joint Commission
- U.S. Bureau of Indian Affairs, Rocky Mountain Region
- U.S. Geological Survey/International Joint Commission

7 Preferred Alternative

7.1 Selection and Rationale for the Preferred Alternative

Alternative 3, Canal Modernization, Reshape (FWFI), was selected as the local and agency Preferred Alternative based on its ability to best address the Federal Objective and Guiding Principles, and provide the most beneficial effects on environmental, social, and economic resources. Alternative 3 would achieve the following:

- Increase the capacity of the St. Mary Canal System to 850 cfs.
- Improve the reliability of the St. Mary Canal System by addressing the concerns with the aging canal, siphon, wasteways, underdrains, and Drop Structures.
- Deliver an additional approximately 21,538 AF/year to beneficiaries.

Alternatives 2 and 3 were considered to address the purpose and need. Alternative 2 would include a geosynthetic liner within the first 9-miles of the canal, with the remaining 20 miles as an earthen bottom and banks. Alternative 3 would have an earthen bottom and banks throughout the entire 29 miles of the canal. Alternative 2 would deliver an additional approximately 6,784 AF/year due to the inclusion of the liner but would present other concerns, such as additional wetland impacts due to seepage reduction along the 9-miles and additional maintenance to maintain the liner compared to an earthen bottom. Alternative 2 would have an additional cost of approximately $53 million.

Based on evaluation of the alternatives, Alternative 3 would have fewer impacts on wetlands and streams than Alternative 2. NRCS and MRJBOC have worked to analyze the hydrologic effects that the proposed St. Mary Canal System modernization would have on St. Mary River, Milk River, streams, groundwater, and wetlands. The public commented with concerns regarding impacts on adjacent private wells. The analysis noted that the area of influence from the St. Mary Canal System seepage is not affecting the adjacent wells (see Appendix D2). Alternative 3 would have an increase in seepage, so even if there was influence from this source, the wells would not be affected.

7.2 Ecosystem Services

When considering trade-offs of the effects on ecosystem services, Alternative 3 would have more beneficial effects than both Alternative 2 and the No-Action Alternative. The Preferred Alternative would protect ecosystem services, including regulating, provisioning, and cultural services (Section 5.10). In the face of current conditions and future environmental changes, the Preferred Alternative would support the agricultural resiliency of Milk River Project beneficiaries and the health and resiliency of the Milk River. This alternative is expected to improve conditions related to the Guiding Principles.

7.3 Measures to be Installed

Under Alternative 3, MRJBOC would reshape and modernize the infrastructure of the 29-mile St. Mary Canal System, as discussed in Chapter 4.4.3. The underdrains would be replaced and upsized 6 inches each at the existing locations. The waterways would be replaced at the existing locations and sizing would be reviewed during final design and increased if needed. Drains would be replaced at existing locations and at existing sizes. The drains would be modernized to include manual gate opening release and passive overflow level control mechanisms. Slope stability mitigation would occur at known and identified landslide areas. A new 10-foot-by-10-foot RCB would be installed parallel to the existing Kennedy Creek siphon. The existing siphon would be evaluated and rehabbed, which may include coating, slip lines, or patching. The O&M road would be widened to allow for more reliable access for O&M of the St. Mary Canal System. Information about the sizing of measures and other structural work to be completed as part of this project can be found in Chapter 4.4.2.

Construction of the Preferred Alternative would include mobilization and staging of construction equipment, delivery of piping to construction areas, excavation of the canal and trenches for pipes, fusing of pipelines, removal of existing pipe in certain areas, placement of pipe, compaction of backfill, and restoration and reseeding of the disturbed areas. In some locations, construction access would need to be created prior to bringing pipes or equipment into construction areas. This could include removal of vegetation within the construction area. Appropriately sized construction equipment would be used to minimize disturbance in the construction area. Borrow material would most likely be needed to backfill the canal surrounding pipelines. Construction would occur from April through October, with project construction beginning as early as the 2026 to 2027 season.

7.4 Irreversible or Irretrievable Commitment of Resources

The Preferred Alternative would have irreversible and irretrievable effects. Irreversible effects are those caused by the proposed program that cannot be reversed and are considered permanent. Irretrievable effects are gains and losses of outputs, such as land use, and may occur in the short term or long term.

Irretrievable and irreversible effects include the following:

- The Preferred Alternative would require construction equipment and materials and other energy in the form of labor and fossil fuels
- Implementation of the Preferred Alternative would allow for increased water diversion from the St. Mary River.
- Other permitted impacts associated with the project are discussed in Chapter 5.

7.5 Areas of Controversy

Although there were comments and questions regarding the project, there were no areas of controversy based on the way the project was described during scoping. If areas of controversy are identified during the review of the Draf Plan-EIS, they will be identified and discussed in the Final Plan-EIS.

7.6 Minimization, Avoidance, and Compensatory Mitigation Measures

Project design features and BMPs that would be applied during construction of the Preferred Alternative to avoid and minimize effects on environmental and social resources are described below.

7.6.1 Land Use

Land conversion for permanent ROW will require the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 to be followed.

7.6.2 Coordination with Landowners

Prior to construction, MRJBOC would coordinate with each landowner along the St. Mary Canal System to discuss the project and obtain a permanent or temporary easement agreement. MRJBOC would provide adjacent landowners with a construction schedule before construction begins. Where possible, work would be confined within existing St. Mary Canal System ROW. Any ROW areas acquired would follow the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. Trust land would be coordinated with the BIA during final design of the Preferred Alternative. Any impacts or easements to USFWS easements would need to be coordinated with the Benton Lake USFWS Wetland Management District, a Special Use Permit may be required for these locations.

Coordination relating to construction timing would also occur with Milk River Project beneficiaries such as municipalities and irrigation districts during final design.

7.6.3 Erosion Control

The St. Mary Canal System would be disturbed during construction, and sediment may temporarily increase causing a minor, temporary effect on water quality parameters within the canal and downstream waterbodies. The canal bottom and banks would be stabilized using riprap, vegetation, or similar means to reduce the effects. The Preferred Alternative would have more than 1 acre of disturbance and would require a general construction NPDES permit and a SWPPP. These would also help in maintaining water quality standards. Further geotechnical studies and analysis would need to occur on soils present within the action area to complete design of the project while minimizing bank and slope stability issues. Standard BMPs would be utilized to minimize runoff into adjacent waterbodies.

7.6.4 Wetlands and Surface Waters

A detailed analysis of permanent impacts on wetlands and surface waters would be completed for each phase of the St. Mary Canal System as final design occurs. A wetland delineation, including a consideration of the hydrology source (i.e. seepage, surface flow, etc.) to the wetland, would be completed within 5 years of planned construction for each identified phase of the project. A jurisdictional determination would be completed for the results of the wetland delineation. The delineated boundaries would be used to determine ways to avoid or minimize direct impacts on the wetland areas during final design for wetlands that are jurisdictional under the Clean Water Act and EO 11990.

The impacted areas would be recalculated to confirm the acreages affected. USACE and the Blackfeet Tribe were included in initial scoping and ongoing coordination has occurred during the development of this EIS. The Blackfeet Tribe wetland specialist was on site with the team to confirm the types and initial boundaries of the wetlands along the St. Mary Canal System. Continued coordination would occur with the following:

- USACE to determine (based on an approved jurisdictional determination request from MRJBOC) jurisdiction of wetlands under Section 404 of the Clean Water Act.
- USACE to review request for concurrence from MRJBOC elements of fill activities in jurisdictional WOTUS that meet the exemptions (404 (f)) to Section 404 of the Clean Water Act.
- USACE to review pre-construction notification for activities presumed to quality for Regional General Permit #23 – Irrigation Ditch Related Activities in the State of Montana and provide guidance on mitigation requirements.
- Blackfeet Tribe, who has the CWA Section 401 certification under their authority. Obtaining a permit under the Blackfeet Ordinance 117, the Blackfeet Aquatic Lands Protection Ordinance will be required. Blackfeet Ordinance 117 protects water quality and wetlands on the Blackfeet Indian Reservation and requires a permit for work within all waterbodies, aquatic and riparian lands, and wetlands within the Blackfeet Reservation.

If determined to be required by the USACE, a Section 404 permit application would be completed. Mitigation would be identified for permanent impacts caused by the project and a mitigation plan would be completed for each phase and included with the Section 404 permit application.

NRCS would review each phase and the impacts on wetlands for compliance with EO 11990. Potential mitigation options would be determined during the design phase, including any potential mitigation bank credits and off- or on-site mitigation. Coordination with each entity noted above would occur to determine the appropriate amount and type of mitigation to meet the regulations.

Additional wetland delineation and mitigation costs are included in Table 7-2 under Installation Costs, Other Funds.

7.6.5 Revegetation and Noxious Weed Management

When necessary, compacted areas, such as access roads, stream crossings, and staging and stockpiling areas, would be loosened to facilitate revegetation and improved infiltration. Disturbed areas would be revegetated following guidelines developed in partnership with the NRCS (Orloff et al. 2022) as well as guidance from the local NRCS office staff. Tree clearing would occur within the proposed construction limits, and tree plantings would not occur to avoid issues with future effects on the St. Mary Canal System due to roots. These areas would be reseeded with grassland species following completion of construction activities. Temporary vegetation impacts would be mitigated through the use of a revegetation plan and monitored until vegetation has been reestablished. Reclamation, including reseeding, of disturbed areas along the O&M Roadway would be completed following each phase of construction where possible.

Guidelines for several noxious weed species present within the project area are provided by the NRCS (NRCS 2025), additionally, the MTNHP provides management options. Strategies outlined by these organizations would be utilized during and after construction to minimize invasive and noxious species spreading. Control strategies for two specific species, the Canada thistle and spotted knapweed, will also be utilized and include:

- Planting competitive native perennials – Reclamation and MRJBOC would coordinate with the NRCS office to identify seed mixes during final design.
- Herbicide application following construction
    - Herbicide application at bud stage or during fall regrowth, fall spraying can increase winter kill
    - Wick applicators are preferred to minimize damage to non-target species
    - Special care would be taken in riparian zones to avoid herbicide contamination of water resources.

An Integrated Pest Management (IPM) approach would be completed, emphasizing coordination with the NRCS, Glacier County, and the Blackfeet Tribe. This would include developing a herbicide application plan and cultural control schedule. Along the O&M road—particularly near the main diversion and St. Mary Siphon, mowing, tilling, and herbicide use may be applied. Disturbed areas would be revegetated as soon as possible after construction to reduce the risk of weed colonization, including temporary easement areas.

BMPs during construction would include:

- Cleaning all equipment and vehicles of organic debris and soil before entering or leaving the site
- Avoiding travel through heavily infested areas when possible
- Proper disposal of removed vegetation from infested zones

Special care is needed in riparian zones along the canal to avoid herbicide contamination of water resources (MTFWP 2008).

During excavation, topsoil would be saved and replaced as the top layer after trenches are filled. In areas where infrastructure is decommissioned, topsoil would be added from off-site. Areas disturbed during access or construction would be regraded to their original contours unless the area is dominated by invasive species/noxious weeds prior to construction (as noted in MTDOT 2018). If the dominant populations of these species are present the topsoil should be removed and replaced with soil from other areas along the project if possible, to avoid replacing a seedbed of invasive weeds. Stockpiles of dirt should not be left unvegetated longer than necessary or should be covered to avoid colonization of invasive/noxious species. Soil replacement and reseeding would be required under the NPDES.

7.6.6 Historic Properties and Cultural Resources

The Preferred Alternative would require a completed PA, which is currently being developed by NRCS and the consulting parties in accordance with 36 CFR § 800.14(b). The PA would establish the process to identify, evaluate, treat, and resolve adverse effects on historic properties in the APE of the Preferred Alternative.

Selecting the Preferred Alternative would result in adverse effects on the St. Mary Canal System (24GL0155) and other historic properties located in the project APE. As such, resolution of adverse effects would require development of MOAs and Treatment Plans in consultation with the Blackfeet THPO, Reclamation, MRJBOC, and the other consulting parties for this undertaking. ACHP would also be notified and invited to participate in developing mitigation plans to resolve adverse effects. These documents would be included as appendices in the PA and would be developed as construction methods and extents are established and as project effects become more defined.

The stipulations of the mitigation plans would be followed during construction of the Preferred Alternative. Prior to the start of construction, supplemental pedestrian archaeological surveys would be completed on those portions of the project APE that have not been documented during previous research. Tribal monitors would also be required during construction. If archaeological resources are inadvertently discovered during construction, an Inadvertent Discovery Plan would be followed.

Cultural survey costs and mitigation are included in Table 7-2 under Installation Costs, Other Funds.

7.6.7 Migratory Birds and Eagles

Before construction, Reclamation, NRCS, and MRJBOC would coordinate with USFWS and Blackfeet Tribal biologists to identify known active nests. A qualified biologist would field verify if any trees within 0.5 mile of the project site are actively being used for eagle nesting. If nesting is identified, coordination with USFWS would occur to incorporate BMPs during the entirety of the construction process to minimize impacts on eagles within the vicinity of the project area. To

minimize impacts on migratory birds, vegetation clearing would be conducted during the non-nesting period, or a qualified biologist would survey the site before construction begins to identify any nesting sites. If sites are identified, coordination would occur with NRCS and USFWS.

7.6.8 Threatened and Endangered Species

Conservation measures would be implemented to minimize or eliminate short-term, adverse, construction-related and human impacts on grizzly bears. It is known that anthropogenic food, garbage, and other attractants associated with resource management activities increase the risk of grizzly bear mortality. To safeguard there are no adverse effects on grizzly bears, contractors would be required to comply with the Blackfeet Nation, Fish and Wildlife Code Chapter 4. The Blackfeet Nation implements and monitors compliance with attractant storage regulations in areas normally occupied by grizzly bears. This includes public reservation lands in the PCA and most public reservation lands in Zone 1. Residents and visitors in “normally occupied” grizzly bear habitat are required to store attractants in a bear-resistant manner. Purchasers, employees, contractors, and subcontractors must store trash in bear-resistant containers (containers listed by the Interagency Grizzly Bear Committee), remove trash daily, and refrain from feeding wildlife. Regulations are enforceable by Tribal wardens and Tribal police.

Conservation measures would be implemented to minimize or eliminate short-term, adverse, construction-related noise and human impacts on the bull trout. Conservation measures include:

- Implement measures to keep in-water work in Kennedy Creek to the minimum amount necessary. This includes, but is not limited to, construction and removal of any existing or temporary support structures that may be necessary.
- Implement erosion control measures to prevent further sediment and turbidity from affecting water quality in the creek.
- Implement an in-water work window from July 15 to December 1 to allow fish movement.
- Isolate the work area to lessen noise attenuation and turbidity.
- Maintain both upstream and downstream passage for bull trout during construction.
- Maintaining stream flow through one of the two identified braided channels throughout construction.

If the federal status of the monarch butterfly should change prior to the finalization of the Plan-EIS, and addendum to the current version of the BA would be prepared with updated information.

7.6.9 Public Safety

Traffic control plans would be created in consultation with Glacier County, the Blackfeet Tribe, and emergency services within the area prior to construction.

7.7 Permits and Compliance

MRJBOC would acquire all necessary permits prior to construction, including the permits discussed in the following subsections, as applicable. Permitting costs are included in Table 7-2 under Installation Costs, Other Funds.

7.7.1 Tribal or Local

Blackfeet Ordinance 117

A permit is required under Blackfeet Ordinance 117, the Blackfeet Aquatic Lands Protection Ordinance. Blackfeet Ordinance 117 protects water quality and wetlands on the Blackfeet Indian Reservation and requires a permit for work within all waterbodies, aquatic and riparian lands, and wetlands within the Blackfeet Reservation (Blackfeet Environmental Office 2019).

7.7.2 Federal

National Historic Preservation Act

In accordance with the NHPA of 1966 as amended (54 U.S.C. § 300320), and its implementing regulations found in 36 CFR § 800, federal agencies must take into account the potential effect of an undertaking on "historic properties," which refers to cultural resources listed in, or eligible for listing in, the NRHP. Consultation with the Blackfeet THPO and other consulting parties to fulfill Section 106 obligations should be completed for the project prior to implementation.

Clean Water Act

National Pollution Discharge Elimination System

The NPDES program, implemented by EPA, would require a permit for construction activities, including clearing, grading, excavation, material or equipment staging, and stocking piling that would disturb 1 or more acres of land and have the potential to discharge into a public waterbody.

Section 404

Under Section 404(f)(1)(C) of the CWA, discharges of dredged or fill material associated with construction or maintenance of irrigation ditches or the maintenance (but not construction) of drainage ditches are not prohibited by or otherwise subject to regulation under Section 404 (EPA 2024b). Discharges of dredged or fill material associated with the siphon, pumps, headgates, wingwalls, weirs, diversion structures, and such other facilities as are appurtenant to and functionally related to irrigation ditches are included in the exemption for irrigation ditches. Under 33 CFR 323.4(a)(1)(iii)(C)(1)(i), "construction and maintenance of upland (dryland) facilities, such as ditching and tiling, incidental to the planting, cultivating, protecting, or harvesting of crops, involve no discharge of dredged or fill material into waters of the United States, and as such never require a Section 404 permit." The construction and maintenance of irrigation ditches and maintenance of drainage ditches may require the construction and/or maintenance of a farm road. Prior to construction activities, coordination and consultation with

USACE would occur and measures would be taken, as required, to identify and mitigate impacts on potential jurisdictional wetlands and WOTUS.

Section 401

Section 401 of the CWA authorizes EPA to review proposed activities or facilities that require a federal permit and that may discharge into the waters of Montana.

Farmland Protection Policy Act

The term “prime farmland” is assigned by USDA to land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for such uses. The Farmland Protection Policy Act (FPPA; 7 U.S.C. § 4201 et seq.) requires federal agencies to consider the adverse effects of their actions on prime or unique farmland. Farmland subject to FPPA requirements does not have to be used currently for cropland. The land can be forested land, pastureland, cropland, or other land, but it cannot be water or urban, built-up land. The purpose of the FPPA is “to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.” FPPA does not authorize federal agencies to regulate the use of private or non-federal land, or in any way affect the property rights of owners.

Agricultural land would be impacted adjacent to the St. Mary Canal System, and approximately 16 acres would need to be converted into permanent ROW. A farmland conversion worksheet is being developed based on soil data obtained from the USDA Web Soil Survey and coordination with NRCS. Further coordination and soil studies may be required to provide a farmland conversion worksheet on final project effects on prime or unique farmland.

Section 7 of the Endangered Species Act

A BA is being drafted and will be coordinated with USFWS in accordance with Section 7 of the ESA. The BA includes the effect determination noted in this Draft EIS on each listed species due to the project and lists the mitigation commitments that will be required for the project. The effect determination and mitigation commitments will be updated in the Final EIS and ROD upon the completion of the BA and USFWS BO.

Safe Drinking Water Act

Permitting under the Safe Drinking Water Act is not required since the project would have no direct or indirect discharge to groundwater.

Migratory Bird Treaty Act

The MBTA implements various treaties and conventions between the U.S. and other countries, including Canada, Japan, Mexico, and the former Soviet Union, for the protection of migratory birds (16 U.S.C. 703–712). Under the Act, taking, killing, or possessing migratory birds, or taking, destroying, or possessing their eggs or nests, is unlawful. The Act classifies most species of birds as migratory, except for upland and nonnative birds, such as pheasant, chukar, gray partridge, house sparrow, European starling, and rock dove. To minimize impacts on

migratory birds, vegetation clearing would be conducted during the non-nesting period, or a qualified biologist would survey the site before construction begins to identify any nesting sites. If sites are identified, coordination would occur with NRCS and USFWS.

Bald and Golden Eagle Protection Act

The BGEPA prohibits anyone from "taking" bald and golden eagles (including their eggs or nests) without a permit from the Secretary of the Interior (16 U.S.C. 668a–668d). A qualified biologist would field verify if any trees within 0.5 mile of the project site are actively being used for eagle nesting. If nesting is identified, coordination with USFWS would occur to incorporate BMPs during the entirety of the construction process to minimize impacts on eagles within the vicinity of the project area. To minimize impacts on migratory birds, vegetation clearing would be conducted during the non-nesting period, or a qualified biologist would survey the site before construction begins to identify any nesting sites. If sites are identified, coordination would occur with NRCS and USFWS.

7.8 Installation and Financing

The following sub-sections present the proposed installation and financing for the Preferred Alternative. Included in this section is a framework for implementing the Preferred Alternative, the sequence of installation, responsibilities, contracting, real property and relocations, other agencies, historic properties and cultural resources, financing, and conditions for providing assistance.

7.8.1 Framework for Carrying Out the Plan

The Preferred Alternative is proposed to be implemented in a planned sequence, which is discussed in Section 7.5.2. This sequence could change in the future, depending on funding availability and local conditions. The responsibilities of NRCS and the project sponsor are discussed in Section 7.5.3. No cost-shared, on-farm measures are involved with this project; therefore, the responsibilities of individual participants do not need to be discussed. No preconditions are anticipated for project construction.

7.8.2 Planned Sequence of Installation

MRJBOC would obtain all approvals and permits for the project prior to the start of construction. The entire project would be completed over a 12-year period, anticipated to commence in 2026-2027. MRJBOC will develop an appropriate project phasing schedule based on engineering and funding constraints as well as a limited period every year in which construction could occur.

7.8.3 Responsibilities

NRCS is responsible for leading the planning efforts, providing engineering design and construction oversight assistance, and certifying project completion. MRJBOC would be responsible for engineering design, project administration, environmental permitting, contracting, and construction implementation. Prior to project construction, Reclamation would

transfer infrastructure components to MRJBOC, as appropriate, who would have the authority to implement the actions described in this Plan-EIS.

7.8.4 Contracting

MRJBOC would primarily be responsible for overseeing and administering construction of the project in coordination with NRCS.

7.8.5 Real Property and Relocations

Real property acquisition would be required for the Preferred Alternative. No relocations would be required. MRJBOC would be responsible for securing the ROW areas as outlined in NWPM 504.4b(1) (the Watershed Program Management Manual) and must follow the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C 61).

7.8.6 Financing

For projects implemented through PL83-566 (16 U.S.C.18 §1004), the Secretary of Agriculture established cost-share rates at up to 75 percent federal for works of improvement conducted for Agricultural Water Management purposes. EO 10584 (19 F.R.8725 as amended) directs the agency to coordinate, review, and approve assistance proposed under PL 83-566 when actions involve or occur in other agencies' lands or authority. The Reclamation Act of 1902 (32 Stat 388) and subsidiary directives and standards allocate portions of OM&R costs to Irrigators and Reclamation. For the Milk River Project, St. Mary Canal segment, Reclamation funds 26.04 percent of costs through reimbursement. The result of that coordination for this project is to allocate 26.04 percent of the 75 percent maximum federal portion to Reclamation and the remaining difference, 48.96 percent, to PL-566 (NRCS) funds for eligible project costs. Both NRCS and Reclamation pay on a reimbursable basis after funds are expended and construction accepted. Additional Sponsor and NRCS responsibilities would be addressed in the Watershed Agreement prior to submission for authorization.

Non-federal match of 25 percent would be required of the Sponsor. MRJBOC is responsible for securing funding for the remaining 25 percent of the costs, including funds that are not eligible under the National Watershed Program. Much of the required match funding is expected to be provided through grants. If necessary, a portion of the project cost would be financed through loans. These financing costs of a loan are not included in the National Economic Efficiency (NEE) analysis.

Operational costs after project completion would be provided through MRJBOC revenues. Operation costs would decrease due to the project and would be budgeted on an annual basis. NRCS reserves the authority and right to discontinue or reduce program benefits based on changes in agency priorities, funding availability, or the failure of MRJBOC to fulfill the provisions of their agreement.

7.8.7 Conditions for Providing Assistance

Conditions for MRJBOC to receive program funds for the proposed project include completion of a Final Plan-EIS and congressional notification due to the cost being more than $25 million, NRCS issuing a Record of Decision (ROD), and authorization of funding by the Chief of NRCS. The Chief of NRCS acts on behalf of the Secretary of Agriculture to ensure the project meets 16 U.S.C.1005.

7.9 Operation, Maintenance, and Replacement

The project would be operated and maintained by Reclamation under the current agreement between the MRJBOC and the agency. The O&M agreement would cover the 100-year program life of the facility. O&M activities include, but are not limited to, maintenance of the structures, stream monitoring, and repair and replacement of inoperable components.

A specific O&M agreement will be entered into before beginning construction. In addition to specific sponsor responsibilities for the project measures, the O&M agreement will include specific provisions for retention, use, and disposal of property acquired or improved with PL-566 assistance. The plan will have an O&M agreement that is based on 180-NOMM, Part 500, noting the O&M for each measure.

7.10 Economic and Structural Tables

A summary of the economic analysis of the Preferred Alternative (NEE Alternative) and Future Without Project is provided in Appendix D5. The costs and benefits associated with the project are detailed in the following tables in this section. The cost of wetland mitigation and future cultural resource surveys is included within the contingencies for the project. The cost of geotechnical investigations is included within the engineering cost.

Table 7-1. Economic Table 1 – Estimated Installation Cost St. Mary and Milk River Watersheds, Montana ($[1])

Works of Improvement	Unit	Federal Land – Number	Non-Federal Land – Number	Total – Number	Federal Funds: Public Law 83-566 (NRCS)/Reclamation Act (Reclamation) [2] – Federal Land	Federal Funds: Public Law 83-566 (NRCS)/Reclamation Act (Reclamation) [2] – Non-Federal Land	Federal Funds: Public Law 83-566 (NRCS)/Reclamation Act (Reclamation) [2] – Total	Other Funds – Federal Land	Other Funds – Non-Federal Land	Other Funds – Total
Siphon Modification (Kennedy Creek)	Acres	16.0	0.0	16.0	$2,205,416/ $746,100	$0	$2,951,516	$1,050,140	$0	$1,050140
Drop Structure Replacement (Structures 1, 3, and 4)	Acres	20.0	15.0	35.0	$7,509,277/ $2,540,415	$7,537,269	$17,586,961	$3,568,963	$2,676,722	$6,245,685
Slope Stability (Slide Mitigation)	Acres	35.0	30.0	65.0	$20,262,944/ $6,855,026	$23,243,974	$50,361,944	$9,634,401	$8,258,058	$17,892,459
Canal Reshaping (includes integral measures of wasteway, drain, underdrain replacement, and operation and maintenance roads)	Acres	118.0	128.0	246.0	$15,393,671/ $5,207,734	$22,347,287	$42,948,692	$7,327,598	$7,327,598	$15,276,179
Total	**Acres**	**189.0**	**173.0**	**362.0**	**$45,371,308/ $15,349,275**	**$53,128,530**	**$113,849,112**	**$21,581,102**	**$18,883,361**	**$40,464,463**

[1] Price base 2023; Prepared in 2025
[2] Federal construction funds would be split between NRCS (48.96%) and Reclamation (26.04%).

Table 7-2. Economic Table 2 – Estimated Cost Distribution, St. Mary and Milk River Watersheds, Montana ($[1])

Works of Improvement	Installation Cost – Federal Funds **Construction[2]**	Installation Cost – Federal Funds **Engineering**	Installation Cost – Federal Funds **Real Prop Rights**	Installation Cost – Federal Funds **Project Admin**	Installation Cost – Federal Funds **Total Public Law 83-566**	Installation Cost-Other Funds **Construction[2]**	Installation Cost-Other Funds **Engineering**	Installation Cost-Other Funds **Real Prop Rights[3]**	Installation Cost-Other Funds **Permits[4]**	Installation Cost-Other Funds **Project Admin**	Installation Cost-Other Funds **Total Other**	Total **Installation Costs**
Siphon Modification (Kennedy Creek)	$2,148,906	$510,145	$0	$292,465	$2,951,516	$716,302	$0	$2,498	$331,339	$0	$1,050,140	$4,001,655
Drop Structure Replacement (Structures 1, 3, and 4)	$12,804,511	$3,039,761	$0	$1,742,688	$17,586,961	$4,268,170	$0	$3,190	$1,974,325	$0	$6,245,685	$23,832,646
Slope Stability (Slide Mitigation)	$36,666,942	$8,704,647	$0	$4,990,354	$50,361,944	$12,222,314	$0	$16,477	$5,653,668	$0	$17,892,459	$68,254,403
Canal Reshaping (includes integral measures of wasteway, drain, underdrain replacement, and operation and maintenance roads)	$31,269,588	$7,423,327	$0	$4,255,777	$42,948,692	$10,423,196	$0	$31,532	$4,821,451	$0	$15,276,179	$58,224,871
Total	**$82,889,947**	**$19,677,880**	**$0**	**$11,281,285**	**$113,849,112**	**$27,629,982**	**$0**	**$53,698**	**$12,780,783**	**$0**	**$40,464,463**	**$154,313,575**

[1] Price base 2023; Prepared in 2025
[2] Includes construction management, survey, geotechnical studies, and mitigation measures
[3] Includes legal survey and legal fees
[4] Includes permitting and fees

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Table 7-3. Table 3b – Structural Data—Channel Work, St. Mary and Milk River Watersheds, Montana

Channel Name	Station	Drainage Area (mi^2)	Year frequency design discharge (fps)	Water Surface Elevation Feet (NAVD88)	Hydraulic Gradient (ft/ft)	Channel Dimensions Gradient (ft/ft)	Channel Dimensions Bottom Width (ft)	Channel Dimensions Elevation (NAVD88)	Channel Dimensions Side Slope	*n* Value Aged	*n* Value As-built	Velocities (ft/s)25/Aged	Velocities (ft/s)25/Aged As-built	Excavation Volume (yd^3)	Type of Work	Existing Channel Type	Present Flow Condition
St. Mary Canal Diversion to Kennedy Siphon (1)	NA	NA	850	4471.55-4469.44	0.000087	0.00017	26.5	4463.05-4458.89	1.5:1	0.022-0.026	NA	2.5	NA	31,716 (Fill)	II	M(1915)	NA
Kennedy Siphon to St. Mary Siphon (2)	NA	NA	850	4464.98-4461.99	0.00013	0.00014	28.0	4457.61-4454.42	1.5:1	0.022-0.026	NA	2.3	NA	143,779 (Fill)	II	M(1915)	NA
St. Mary Siphon to Halls Coulee (3)	NA	NA	850	4444.22-4439.31	0.00011	0.00011	31.5	4437.65-4432.36	1.5:1	0.022-0.026	NA	2.1	NA	76,269 (Fill)	II	M(1915)	NA
Halls Coulee to Drop 1 (4)	NA	NA	850	4425.19-4419.67	0.00012	0.000097	32.0	4417.1-4412.24	1.5:1	0.022-0.026	NA	2.0	NA	72,015 (Fill)	II	M(1915)	NA

Prepared in 2025

Table 7-4. Economic Table 4 – Average Annual Preferred Alternative Costs, St. Mary and Milk River Watersheds ($)[1]

Works of Improvement	Amortization of Installation Cost[12]	Operation, Maintenance Replacement Cost	Other Direct Costs[3]	Total Costs
Siphon Modification (Kennedy Creek)	$126,690	$55,113	$1,978	$183,782
Drop Structure Replacement	$719,247	$308,051	$22,278	$1,049,576
Slope Stability (Slide Mitigation)	$1,963,133	$854,367	$30,650	$2,848,150
Canal Reshaping	$1,451,249	$582,250	$130,473	$2,163,973
O&M Road Improvements[4]	$43,153	$18,531	$674	$62,358
Total	**$4,303,472**	**$1,818,312**	**$186,053**	**$6,307,839**

[1] Price base 2025; Average annual cost and benefits are computed as an annualization of present values over a 100 year period and with a 3.25% discount rate. (does not include escalation to the midpoint of construction).
[2] Price base 2025, based on 2% of construction and engineering (and related) costs
[3] Interest during construction
[4] Pertinent elements of O&M road construction are included under Reshaping
Prepared in 2025

Table 7-5. Economic Table 6 – Comparison of Preferred Alternative Benefits and Costs, St. Mary and Milk River Watersheds

Works of Improvement	Recreation[1]	Water Delivery (Agricultural and M&I)[1]	Average Annual Benefits[1]	Annual Costs[2]	Benefit Cost Ratio
Siphon Modification	$449,456	$4,858,567	$5,308,023	$183,782	28.88
Drop Structure Replacement	$93,526	$905,529	$999,055	$1,049,576	.95
Slope Stability (Slide Mitigation)	$18,487	$179,282	$197,769	$2,848,150	.07
Canal Reshaping	$168,113	$2,275,859	$2,443,972	$2,163,973	1.13
O&M Road Improvements	$84,488	$737,885	$822,373	$62,358	13.19
Total	**$814,071**	**$8,957,122**	**$9,771,193**	**$6,307,838**	**1.55**

[1] Price base 2025
[2] Price base 2025; Average annual cost and benefits are computed as an annualization of present values over a 100-year period and with a 3.25% discount rate. (does not include escalation to the midpoint of construction).
Prepared in 2025

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9 List of Preparers

Under the direction of NRCS, the Plan-EIS was developed primarily by Farmers Conservation Alliance and its subcontractor HDR. The staff responsible for preparation of the Plan-EIS are included in Table 9-1.

Table 9-1. List of Preparers

Name	Title	Education	Years of Professional Experience	Area Responsible For
Blackfeet Nation				
K. Webb Galbreath	Blackfeet Tribe Operations Manager			Blackfeet Tribe Coordination; EIS Review
Bureau of Reclamation				
Steve Darlinton	Project Manager	BA Civil Engineering, Licensed Professional Engineer	17	EIS Review
Lauri Ward	Environmental Specialist	BS Biology and Environmental Science, Restoration Ecology	24	EIS Review; Biological Assessment
Farmers Conservation Alliance				
Preston Brown	Program Director	BS Biological Systems Engineering, MS Entomology	8	Project Management
Raija Bushnell	Program Specialist	MPA and MSES Natural Resources Management	10	Project Management; EIS QA/QC
Megan Christian	Program Specialist	BSPH Environmental Sciences and Engineering, MS Environmental Health Engineering	3	
Lucas Neff	Program Specialist	BS Natural Resources	1	

Name	Title	Education	Years of Professional Experience	Area Responsible For
HDR Engineering Inc.				
Becky Baker	Senior Environmental Project Manager	BS Environmental Management and Biology	20	EIS Author
Jessica Brisbois	Environmental Project Manager	BS Biology and Environmental Studies, MBA	10	EIS Author
Michaela Carlson	Environmental Scientist	BS Biology, MS Science, Technology, and Environmental Policy	4	EIS Author
Benjamin Fennelly	Water Resources Lead	BS Civil Engineering, MS Civil Engineering, Licensed Professional Engineer	18	EIS Alternatives and Design
Ken Demmons	Senior Project Manager	BS Industrial Production Tech, MA Public Administration, MS Civil Engineering, Licensed Professional Engineer	33	EIS Alternatives and Design
Stephanie Griffin	Geographic Information Systems	BS Environmental Design; MS Natural Resource Management	15	Geographic Information Systems Analyst
Jon Schick	Biologist	BS Environmental Design/Planning; MS Environmental Science	18	Biology
Matt Hodgson	Technical Editor	MA Composition Theory and Rhetoric; BA English and Education	18	EIS

Name	Title	Education	Years of Professional Experience	Area Responsible For
Matt Pillard	Environmental Project Manager	BS Agricultural Science and Natural Resources, MS Community and Regional Planning	27	Technical Advisor, EIS QA/QC
Andrew Mueller	Archeologist	PhD (Industrial Heritage and Archaeology)	30	Cultural Resources
Stan Schweissing	Irrigation Practice Lead	BS Civil Engineering	27	Technical Advisor
Milk River Joint Board of Control				
Jennifer Patrick	Joint Board Project Manager			
State of Montana				
Samantha Treu	Environmental Specialist	BS Conservation Biology and Vertebrate Ecology	19	EIS Review
U.S. Department of Agriculture Natural Resources Conservation Service				
Robert Molacek	State Conservation Engineer	BS Civil Engineering MBA Project Management	32	EIS Review
Alyssa Fellow	Environmental Compliance Specialist	BS Wildlife Biology	15	EIS Review
Meagan Heinen	Civil Engineer			EIS Review
Madeline Mason	Economist			EIS Review
Kari Scannella	NRCS State Geologist	BS Geology	23	EIS Review
Andrew Williamson	Archeologist, Cultural Resources Specialist	MS, Anthropology and Archaeology	25	EIS Review

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10 Distribution List

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