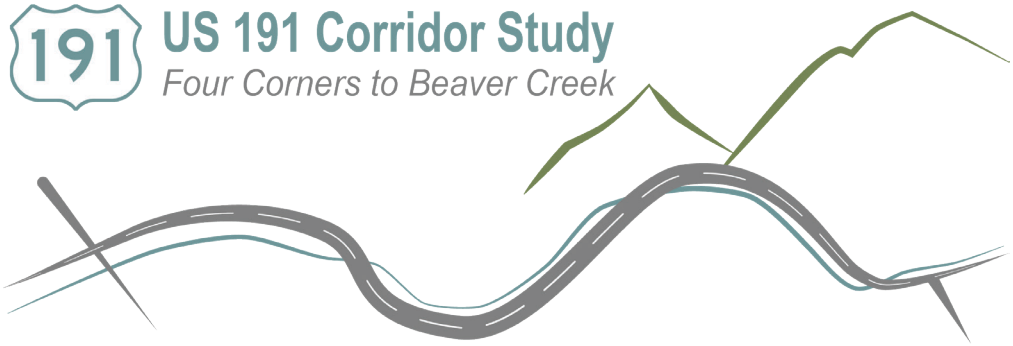
US 191 Corridor Study

*Four Corners to Beaver Creek*



# APPENDIX 3:

## Environmental Scan Report

*Appendix A: Figures*

*Appendix B: Expanded Tables*

*Appendix C: DNRC Water Resources Survey*

*Appendix D: MTNHP Environmental Summary*

*Appendix E: EJSCREEN Report*

# US 191 Corridor Study

*Four Corners to Beaver Creek*

# Environmental Scan

## Technical Memorandum

**January 17, 2020**

*Prepared for:*
**Montana Department of Transportation**

MONTANA MDT DEPARTMENT OF TRANSPORTATION

RPA

*Prepared by:*
**Robert Peccia and Associates**

# TABLE OF CONTENTS

## List of Tables



## List of Figures



## Appendix

# Environmental Scan

## 1.0. INTRODUCTION

The Montana Department of Transportation (MDT) has initiated a corridor study of US Highway 191 (US 191) between Four Corners and the junction with Beaver Creek Road. The purpose of the *US Highway 191 Corridor Study* is to develop a comprehensive long-range plan for managing the corridor and determining what improvements can be made to address identified needs while considering public and agency input, environmental considerations, and financial feasibility. The study will be a collaborative process with MDT, FHWA, local jurisdictions, resource agencies, and the public to identify transportation needs and potential solutions.

This *Environmental Scan* provides a planning-level overview of resources and identifies environmental considerations that may influence the development of improvement options for the study corridor. This Scan is not a detailed environmental investigation but is based on readily available environmental information for the study area. If improvement options are forwarded from the planning study into project development, an analysis for compliance with the National and Montana Environmental Policy Acts (NEPA and MEPA) and other applicable federal and state regulations will be completed as part of the project development process. Information provided in this report is intended to help support future NEPA/MEPA compliance processes.

### 1.1. Study Area

The study area for the *US Highway 191 Corridor Study* is in Gallatin County, Montana between the communities of Four Corners and Big Sky. The study corridor includes US 191 beginning at the intersection with Huffine Lane/Norris Road/Jackrabbit Lane in Four Corners (Reference Post [RP] 81.9) and continues south to the intersection with Beaver Creek Road (RP 45.3). The study area for this *Environmental Scan* encompasses a ¼-mile buffer from the centerline of the roadway along the 37-mile corridor. The study area is shown in **Figure A.1**. The study area occurs in all or part of the following legally described areas in Gallatin County:

- Township 2 South, Range 4 East, Sections 11, 12, 13, 14, 23, 24, 26, and 35
- Township 3 South, Range 4 East, Sections 2, 11, 14, 23, 26, 27, 33, and 34
- Township 4 South, Range 4 East, Sections 4, 5, 7, 8, 18, 19, 20, 28, 29, and 33
- Township 5 South, Range 4 East, Sections 4, 9, 10, 14, 15, 16, 22, 23, 24, 25, and 36
- Township 6 South, Range 4 East, Sections 1, 12, 13, 14, 22, 23, 27, 28, 32, and 33
- Township 7 South, Range 4 East, Sections 4, 5, 8, 9, 16, and 17

### 1.2. Background

US 191 is a National Highway System (NHS) route which connects the greater Bozeman and Belgrade areas to West Yellowstone and Yellowstone National Park. Within the study corridor, US 191 serves the unincorporated communities of Four Corners, Gallatin Gateway, and Big Sky. The study area has experienced substantial growth in recent years, resulting in increased commuter, tourist, recreation, homeowner, and commercial/construction truck traffic from Bozeman to Big Sky. The increase in traffic has put considerable strain on the existing infrastructure. Numerous planning efforts and construction projects on US 191 and associated roads have been completed to address the area's changing needs.

The US 191 corridor provides direct access to the Custer Gallatin National Forest and indirect access to the Beaverhead-Deerlodge National Forest. The Lee Metcalf Wilderness and Hyalite Porcupine Buffalo Horn Wilderness are designated within the forest and are protected from roads and other development by the *Wilderness Act of 1964*.

The roadway parallels Gallatin River throughout the entire study area. The Gallatin River is a tributary of the Missouri River, approximately 120 miles in length, originating in the northwest corner of Yellowstone National Park in northwestern Wyoming. It is one of three rivers, along with the Jefferson and Madison Rivers, that converge near Three Forks, Montana, to form the Missouri River. The Gallatin River, particularly in the Gallatin Canyon, is prized for its high water quality, fishery value, and whitewater sections. Roadside turnouts and designated recreation sites along US 191 in the canyon offer numerous opportunities for convenient access to the river for anglers and other river users.

In addition to providing access to public lands for many recreational visitors and commercial operations, the corridor serves numerous individual residences, rural subdivisions, and commercial enterprises. The area is highly used by recreationists for hiking, backpacking, camping, rock climbing, rafting, fishing, hunting, and more. Resort related developments within the Big Sky area are also accessible via the study corridor. The use of lands accessed by US 191 has historically provided substantial tourism traffic and economic subsistence for the rural communities along the corridor.

## 1.3. Information Sources

Multiple studies, including county growth policies, Forest Plans, and project development documents, have been conducted in the study area over the course of several decades. Some of these addressed proposed improvements to US 191, while others have been concerned with larger-scale issues of land and resource management in the area. The preparers of this document reviewed pertinent information from these studies and supplemented it with publicly available data from federal, state, and local agencies to provide the information presented in the following sections. The information includes the most recently available data as of September 2019. As changes occur over time, it is appropriate to review and update this information during future environmental analyses completed for any projects that may be forwarded from this study.

# 2.0. PHYSICAL ENVIRONMENT

## 2.1. Land Ownership and Land Use

The land in the study area is primarily owned by the USFS and private landowners. Conservation easements held by Montana Land Reliance exist on the west side of US 191 between approximate RP 78 and 77. Conservation easements held by The Nature Conservancy exist on the west side of US 191 approximately from Wilson Creek Road south to the Forest Service Boundary (approximate RP 66.5). Another conservation easement, also held by The Nature Conservancy, exists on the east side of US 191 between approximate RP 49.2 and 48.8. A conservation easement held by Gallatin Valley Land Trust also exists on the east side of the corridor beginning just south of the junction with MT 64 and extending approximately one-quarter mile south. **Figure A.2** shows the existing land ownership.

The study area and adjacent lands with the communities along the corridor are primarily used for residential and commercial uses, while the lands outside the community boundaries are primarily used for crop production, grazing, timber activity, and recreation. There are three large zoning districts along the corridor in which most of the privately-owned parcels exist: Four Corners, North Gallatin Canyon, and Gallatin Canyon/Big Sky zoning districts. The Gallatin Gateway area does not have a designated zoning district, but land uses in the area are assigned and carried out by the *Gallatin Gateway Community Plan*. **Figure A.3** shows the zoning districts and designated land uses as described below:

- The **Four Corners Zoning District** includes the part of the study area which begins at the intersection of US 191/Huffine Lane/Norris Road/Jackrabbit Lane and continues south for approximately three miles (RP 81.9 to 79.0). The land immediately adjacent to US 191 is zoned as commercial use. Behind the commercial development, the land is zoned for mixed use, and further away from the roadway, rural residential and agricultural land uses.
- The **Gallatin Gateway** neighborhood planning area generally begins at Zachariah Lane and extends south to Little Bear Spur (about RP 78 to 73.5). Adjacent to US 191 from Zachariah Lane to Gooch Hill Road (RP 78 to 77), the area is designated as part of “Highway North” which allows commercial and mixed commercial/industrial land uses. Between Gooch Hill Road and Cottonwood Road (RP 77 to 76) the land adjacent to US 191 is designated as part of the “Core” of town and does not call out specific land use requirements. Land extending from Cottonwood Road south for one mile (RP 76 to 75) is part of the “Southern Highway District” as called out in the Community Plan. This area will allow commercial development along US 191. South, to the end of the planning boundary, the land is already developed and is encompassed within the “Existing Development” general land use category.
- The **North Gallatin Canyon Zoning District** extends from Gateway South Road to Luhn Lane (approximately RP 70 to RP 64). Although the district is designated with a jurisdictional boundary, it does not have formal land use designations documented. This zoning district was designated with the primary purpose of establishing regulations for highway signing, including billboards.
- The **Gallatin Canyon/Big Sky Zoning District** begins at approximate RP 56, just north of Karst’s Camp and extends south about 15 miles to the Red Cliff Campground. Within the US 191 study area, the USFS lands are designated as public land use and the private lands are primarily designated as residential single-family use varying in density. Along the US 191 corridor, sections of commercial and industrial mixed land use exist near Karst’s Camp where a few fishing and outdoors outfitters are located, and south of MT 64.

The Gallatin Wildlife Management Area (WMA) has been established along the eastern side of US 191 just south of MT 64 and extending to the end of the study area and other lands to the southeast. WMAs protect important wildlife habitat that might otherwise disappear from the Montana landscape.

If any improvement options are forwarded from the corridor study, additional research and coordination would be needed to determine impacts to existing right-of-way or easements on private and USFS lands.

## 2.2. Soil Resources and Prime Farmland

The *Farmland Policy Protection Act* (FPPA) (7 U.S.C. 4201 et. seq.) requires deliberate analysis for potential farmland impacts of projects with Federal involvement. The FPPA defines the term farmland only as prime farmland, unique farmland, and farmland of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. The FPPA does not apply to lands already in or committed to urban development but does stipulate that federal programs be compatible with state, local and private efforts to protect farmland

The US Department of Agriculture Natural Resources Conservation Service (NRCS) determines where prime farmland exists and maintains mapping resources and information to support the FPPA. Prime farmland soils are those that have the best combination of physical and chemical characteristics for producing food, feed, and forage; the area must also be available for these uses. Prime farmland can be either non-irrigated or lands that would be considered prime if irrigated. Farmland of statewide importance is land, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oilseed crops.

The study area has been mapped by the NRCS and is included in the Gallatin County Area and Gallatin National Forest Area soil survey areas. **Figure A.4** shows that within the Gallatin County Area, about 15 percent of the lands are classified as prime farmland, 10 percent as prime farmland if irrigated, 32 percent as farmland of local importance, and 7 percent of statewide importance. South of approximate RP 67, no soils classified as prime farmland, unique farmland, or farmland of statewide or local importance exist (including within the Gallatin National Forest Area).

Federally funded projects apply the FPPA requirements to determine if prime farmland may be irreversibly converted to nonagricultural use. If any improvement options are forwarded from the planning study to become federally funded projects, coordination with the NRCS will be required to determine the necessary NRCS processing requirements. Projects planned and completed without the assistance of a federal agency are not subject to the FPPA.

## 2.3. Geologic Hazards

The study area is located within the Upper Gallatin Watershed and is situated between the Gallatin and Madison Mountain Ranges. The Gallatin and Madison Ranges are geologically and topographically similar, an essential difference being the thick cap of volcanic material in the high parts of the Gallatin Range. The bedrock within the Upper Gallatin Watershed includes Precambrian metamorphic and metasedimentary rocks, Paleozoic and Mesozoic sedimentary rocks, Cretaceous igneous intrusions, and Tertiary volcanic rocks.[1] Sediments in the valleys are primarily alluvial and glacial deposits. Due to the narrow width of these high-elevation valleys, the alluvial deposits are limited in extent. Glacial deposits are more widespread.[2]

**Figure A.5** presents a geologic map of the study area as depicted on the *Geologic Map of the Bozeman 30'x60' Quadrangle*[3] and *Geologic Map of the Ennis 30'x60' Quadrangle*[4] produced by the Montana Bureau of Mines and Geology in 2014 and 2006, respectively. The study area lies within

several geological map units including alluvium of modern channels and flood plains (Qal), alluvial fan deposits (Qaf, Qafo), braid plain alluvium (Qabo), landslide deposit (Qls), glacial till (Qgt), Madison Valley member (Tscmv), Three Forks and Jefferson Formations (MDTj), Park through Flathead Formations (Ꞓpf), granite porphyry of Hell Roaring Creek (Agp), quartzofeldspathic gneiss (Aqfg), hornblende-plagioclase gneiss and amphibolite (Ahga), biotite schist (Abs), and more.

The MDT Rock Slope Asset Management Program (RAMP) database indicates that there are numerous areas within the Gallatin Canyon with Rock Slope rockfall slope conditions rated as "poor". In these areas, there is potential for rockfall events, possible emergency road closures, and significant disruption of normal traffic operations. Specific areas include approximate MPs 49.5 to 50.5, 52 to 53.5, 56.5 to 58, and 59 to 63.

Montana is considered to be seismically-active. Most seismic activity occurs in western portions of the state generally west of a Livingston-Great Falls-Cut Bank line. According to the *Seismic-Hazard Map for the State of Montana*[5], the US 191 study area is in a moderate to high seismic risk zone. Several small earthquakes occurred in the Gallatin Gateway area in late 1989/early 1990 ranging in magnitude from 0.5 to 2.5 with depths shallower than 10 kilometers. Earthquake events near US 191 through Gallatin Canyon appear to be uncommon. Geotechnical investigations would be required for reconstruction or significant improvements to US 191 to determine potential stability, erosion, and settlement concerns posed by surface geology and soil conditions.

## 2.4. Surface Waters

The study area lies entirely within the Gallatin River Watershed (Hydrologic Unit Code 10020008) as delineated by the United States Geological Survey (USGS). The roadway also lies partially within the Big Bear Creek (HUC 1002000807), Lava Lake (HUC 1002000805), and Porcupine Creek (HUC1002000803) sub watersheds.

US 191 generally parallels the Gallatin River and crosses the river three times throughout the entire study area. The highway is in immediate proximity to the Gallatin River from RP 45.3 though the canyon to approximately RP 70.5. North of the canyon, the river moves away from the highway to the west. US 191 also crosses several streams that are mapped in the USGS National Hydrography Dataset for Montana (**Figure A.6**). Most of the these are named perennial, fish-bearing streams (**Table 2.1**). Information about fish-bearing streams can be found in **Section 3.2.3**. **Fisheries.** Additional unnamed drainages, wetlands (**Section 2.7**), irrigation canals and ditches (**Section 2.4.3**), and other aquatic resources are also present in the study area.

**Table 2.1: Stream and River Crossings**

| Name | Approximate Location (RP) | Crossing Structure |
|---|---|---|
| **South Cottonwood Creek** | 76.7 | Bridge |
| **Big Bear Creek** | 73.7 | Culvert |
| **Big Bear Creek** | 73.8 | Culvert |
| **Wilson Creek** | 72.9 | Culvert |
| **Gallatin River** | 70.5 | Bridge |
| **Spanish Creek** | 68.2 | Bridge |
| **Logger Creek** | 65.0 | Culvert |
| **Hell Roaring Creek** | 64.5 | Culvert |
| **Cave Creek** | 61.9 | Culvert |
| **Gallatin River** | 61.3 | Bridge |
| **Greek Creek** | 58.1 | Culvert |
| **Swan Creek** | 57.3 | Bridge |

| Name | Approximate Location (RP) | Crossing Structure |
|---|---|---|
| Moose Creek | 56.0 | Culvert |
| Tamphery Creek | 54.0 | Culvert |
| Portal Creek | 53.3 | Culvert |
| Goose Creek | 51.9 | Culvert |
| Gallatin River | 49.8 | Bridge |
| Dudley Creek | 48.9 | Culvert |
| West Fork Gallatin River | 48.1 | Bridge |
| Michener Creek | 47.1 | Culvert |
| Beaver Creek | 45.2 | Culvert |

Road construction and reconstruction activities such as bridge or culvert installation or replacement, placement of fill, or bank stabilization have potential impacts to surface waters. Coordination with federal, state, and local agencies would be necessary to determine the appropriate permits based on the improvement options forwarded from this study. Impacts should be avoided and minimized to the maximum extent practicable. Impacts to streams and wetlands may trigger compensatory mitigation requirements.

### 2.4.1. Water Quality

The *Clean Water Act* (CWA), is the principal federal legislation directed at protecting water quality. The Montana Department of Environmental Quality (MDEQ) is the state agency responsible for implementing components of the CWA. As directed by the Montana Water Quality Act, MDEQ prepares an Integrated Report every two years listing the status of water quality for waterbodies under state jurisdiction.

The MDEQ biennial Integrated Reports include a list of all surface waters where pollutants have impaired the beneficial uses of water (for drinking, recreation, aquatic habitats, etc.). The CWA requires the development and implementation of cleanup plans for waterbodies that fail to meet state water quality standards. This typically involves the development of a Total Maximum Daily Load (TMDL) in which MDEQ determines the sources of pollutants and sets the maximum amount of pollutants that each source can discharge to a waterbody.

The Gallatin River and its tributaries in the study area are classified as Use Class B-1 by MDEQ, meaning the beneficial uses of the waters are drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.

According to MDEQ's *Final 2018 Water Quality Integrated Report*[6], the Gallatin River, from Spanish Creek to mouth (Missouri River), is listed as not fully supporting its beneficial uses due to chronic dewatering for crop irrigation. The Gallatin River, from Yellowstone National Park Boundary to Spanish Creek, is listed as fully supporting all applicable beneficial uses. There have been ongoing efforts, beginning in 2001, by locals seeking to designate the Gallatin River from the Yellowstone National Park Boundary to Spanish Creek as an Outstanding Resource Water (ORW) by MDEQ. Waters within national parks and wilderness areas in Montana are designated ORWs.

Storm Castle Creek and West Fork Gallatin River cross the study area and are listed as being impaired or threatened. TMDLs are required to address the impairment of these waters. South Cottonwood Creek begins just outside of the study area.

The study area falls within the Lower Gallatin and Upper Gallatin TMDL planning areas. Most of the required TMDLs have been established and Watershed Restoration Plans have been prepared for each planning area. The purpose of the plans is to develop and implement stream and wetland

improvement projects to address impairments identified by MDEQ, improve water quality, and improve habitat conditions. **Table 2.2** shows the status of the required TMDLs and other impairment information. More detail on beneficial uses supported and beneficial uses impacted by impairment can be found in **Table B.1**.

**Table 2.2: Water Quality and TMDL Status**

| Stream | Use Class | TMDL Completed | Cause of Impairment / Source |
|---|---|---|---|
| **Gallatin River** *Spanish Creek to mouth (Missouri River)* | B-1 | N/A | Flow Regime Modification / Crop Production (irrigated) |
| **South Cottonwood Creek** *Middle Creek Assoc Ditch diversion to mouth (Gallatin River)* | B-1 | N/A | Flow Regime Modification / Crop Production (irrigated) |
| **Gallatin River** *Yellowstone National Park Boundary to Spanish Creek* | B-1 | N/A | N/A |
| **Storm Castle Creek** *Headwaters to mouth (Gallatin River)* | B-1 | N/A | Alteration in vegetative covers / Forest Roads, Silviculture Activities |
| | | No | Phosphorus, Total / Natural Sources |
| | | N/A | Physical substrate habitat alterations / Silviculture Activities, Forest Roads |
| **West Fork Gallatin River** *Confluence Middle and North Forks to mouth (Gallatin River)* | B-1 | N/A | Chlorophyll-a / On-site Treatment Systems, Site Clearance |
| | | Yes | Nitrate-Nitrite / On-site Treatment Systems, Site Clearance |
| | | Yes | Nitrogen, Total / On-site Treatment Systems, Site Clearance |
| | | No | Phosphorus, Total / On-site Treatment Systems, Site Clearance |
| | | Yes | Sedimentation-Siltation / Site Clearance |

In Montana, stormwater management is regulated by MDEQ. A Montana Pollutant Discharge Elimination System (MPDES) general permit is required for stormwater discharges from construction activities that result in the disturbance of equal to or greater than one acre of total land area. The applicability of MPDES permits for US 191 would need to be reviewed for any projects that may be brought forward from the corridor study.

Special permits for small municipal separate storm sewer systems (MS4s) are required for incorporated cities with a population of at least 10,000 people. Bozeman is a designated MS4 area, but the US 191 study area falls outside currently designated MS4 boundaries.

MDT's *Permanent Erosion and Sediment Control (PESC) Design Guidelines*[7] indicate that incorporation of PESC measures should be considered with projects disturbing one acre or more, or projects having the potential to adversely affect water quality. Incorporation of PESC measures will typically be limited to projects with scopes related to rehabilitation or reconstruction and locations in proximity to sensitive resources such as impaired waterways or high-quality aquatic habitat and spawning areas. PESC measures can also provide solutions for areas with a history of erosion or sedimentation problems. The applicability of PESC measures would need to be reviewed for any projects that may be brought forward from the corridor study.

### 2.4.2. Wild and Scenic Rivers

The *Wild and Scenic Rivers Act*, created by Congress in 1968, provided for the protection of certain selected rivers, and their immediate environments, that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. In 1976, Congress

designated portions of the North, South, and Middle Forks of the Flathead River and portions of the Missouri River downstream of Fort Benton as wild, scenic, or recreational components of the National Wild and Scenic River System. In 2018, East Rosebud Creek was also added to the System. None of these rivers are near the study area.

During revision of the *Forest Plan*, a study was conducted to determine if any of the rivers within the forest are found eligible as a wild and scenic river. If found eligible, those rivers are managed within the plan to retain their eligible status. For eligible rivers, national forest lands in a 0.25-mile-wide buffer will be managed to protect the identified river-related outstandingly remarkable values (ORV), tentative classification, along with retaining the free-flowing nature of the waterway. The ORVs identified for the Gallatin River include recreation, scenery, and heritage. A preliminary classification of Recreational River has been identified for the Gallatin River.

### 2.4.3. Irrigation Features

The Gallatin River is the source of irrigation water for about three-fourths of the irrigated land in the Gallatin Valley. Most of the water taken from the main stem of the Gallatin River is diverted between the mouth of the canyon and Four Corners. Groundwater is also an important source of water for irrigation in the Gallatin Watershed. Valley fill deposits from the Quaternary and Tertiary aged geologic deposits are the primary aquifers from which most irrigation water is drawn.[8]

In 2012, 702,713 acres of farmland were used for crop production and livestock cultivation in Gallatin County, compared to 776,868 acres in 2007. Historical areas of farmland near the study corridor in the Four Corners and Gallatin Gateway areas have been converted to commercial and residential development over the past several years. Maps from the Montana Water Resources Survey prepared by the Department of Natural Resources and Conservation (DNRC) showing the historic water resources in the study area can be found in **Appendix C**.

To irrigate the croplands, nearly 2,000 miles of irrigation ditches and canals exist within Gallatin County. Most of the current canals and ditches are privately owned and managed by local irrigators. There are over 60 irrigation features in the county with nearly 30 of the features existing in the Four Corners/Gallatin Gateway area. Within the study area, US 191 runs parallel to the Allison Lewis Ditch from about RP 77.5 to RP 80 at the beginning of the study corridor. The roadway also parallels Gilmore Todd Ditch. Bush Etherington Ditch, and West Gallatin Canal from the Gallatin Gateway area to the mouth of the Canyon (RP 70 to RP 74). US 191 crosses the Farmers Canal at RP 77.8 and the Bush Etherington Ditch at RP 72.2 and 72.8. The Hart Ditch also begins near the study corridor (RP 77.8). Several other smaller ditches and canals exist further south in the study area, as shown in **Figure A.6**.

Coordination with appropriate overseeing authorities and affected landowners would be undertaken if irrigation facilities may be affected by improvement options advanced from this planning project to help avoid or minimize impacts to agricultural operations and downstream water users.

## 2.5. Groundwater

Groundwater is the water present beneath Earth's surface in soil pore spaces and in the fractures of rock formations. In Montana, groundwater is an important source of drinking water for individual homes and public water systems. Groundwater is also important for irrigation and livestock.

The West Gallatin Alluvium covers the Gallatin Valley floor from the mouth of the Gallatin Canyon north past Four Corners. It is made up of coarse sediments from the Gallatin River and is the most productive aquifer in the valley. The Alluvium is generally less than 100 feet thick within the study area. The primary sources of recharge to the Gallatin Valley aquifer system within the study area is surface water flow into the valley via the Gallatin River and tributary streams from the Gallatin Range. The

source, timing and location of surface water recharge to valley aquifers is heavily modified by irrigation practices that redistribute surface waters, especially in the Gallatin Gateway and Four Corners areas. Recharge to the aquifer system from direct precipitation is less significant, and generally occurs during significant rain events, and when valley snow cover melts off in the springtime.[9]

Groundwater resources in Gallatin County are under increasing pressure from land use change from irrigated cropland to residential and commercial development. Much of the new development is dependent on individual household wells for potable water, and on septic systems for wastewater disposal. With increased use, there is a potential for groundwater resources to become overutilized in some locations.

As of September 2019, records maintained by the Groundwater Information Center (GWIC) at the Montana Bureau of Mines and Geology show there are 18,154 wells on record in Gallatin County with about 60 percent of the wells drilled to depths of less than 100 feet. The most common uses for wells in the county are for domestic use, agricultural use (stockwater and irrigation), and for monitoring or testing groundwater.

Based on interactive mapping from the GWIC, more than 900 wells are located within 0.25 miles of the study corridor. Well depths in the study area vary by individual location, but the majority of wells drilled in the study area have been drilled to depths of less than 100 feet. Static water levels vary considerably but range from 0 to 100 feet below the ground surface in most locations.

There are about 50 public water supply wells within the study area. These wells are primarily located at local businesses, schools, or within neighborhoods. Public water supply wells have a setback requirement from MDEQ of a 100-foot isolation zone in which no source of pollutant can be located. Public water supply wells can also be deeper and require a higher volume of water to be discharged.

There are two water and sewer districts within the study area, Four Corners and Gallatin Gateway. Water and sewer districts are units of government within the Montana with limited powers related to water and wastewater services for the communities in which they are located. The Four Corners district supplies both water and wastewater treatment and disposal. The Gallatin Gateway district provides only sewer services and also provides service connections further north of the designated boundary

**Figure A.6** shows the locations of the public water supply, domestic, agricultural, and monitoring wells only within the study area. The Four Corners and Gallatin Gateway Water and Sewer Districts are also shown on the map. Impacts to the groundwater supply should be considered in any improvement option that may be brought forward from the planning study.

## 2.6. Floodplains and Floodways

Floodplains are the flat or nearly flat land adjacent to a stream or river that experiences occasional or periodic flooding. The floodplain includes the “floodway” which consists of the stream channel and adjacent areas that carry flood flows and the “flood fringe” includes the area covered by the flood.

Executive Order (EO) 11988, *Floodplain Management*, requires efforts be taken to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. The natural and beneficial values of floodplains include providing habitat for fish, wildlife, plants, open space, natural flood moderation, water quality maintenance, and groundwater recharge. EO 11988 requires projects undertaken or funded by federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

Compliance with this directive requires an evaluation of a proposed project and its alternatives to determine the effects of any encroachments on the "base" floodplain. The base floodplain is the area covered by water from the 100-year flood and is a regulatory standard used by federal agencies and states to administer floodplain management programs. The 100-year flood represents a flood event that has a 1 percent chance of being equaled or exceeded in any given year.

From Four Corners to the mouth of the Gallatin Canyon, US 191 lies adjacent to the Gallatin River floodplain but the roadway itself lies outside the floodplain boundary (Zone X – area of minimal flood hazard). FEMA's website shows most of the area through Gallatin Canyon as being within Zone D (area of undetermined flood hazard). However, the area near Karst's Camp (approximate RP 56 to 54) and from RP 51 through the end of the study area cross or lie within Zone A (1 percent annual chance flood hazard/100-year floodplain) of the Gallatin River. The study area floodplains are show in **Figure A.7**. More detailed floodplain mapping for segments of the Gallatin River has recently been completed and will be adopted by FEMA.

Flooding has occurred in the Gallatin River Watershed in the past but most often affects the smaller streams and creeks within the study area. High precipitation events and snowmelt from the mountains are the primary causes of flooding in the area. The *Gallatin County Floodplain Regulations*[10] regulate development activities in flood hazard areas. Coordination with the Gallatin County floodplain administrator would be necessary if any improvement options advanced from this study cross or encroach on a regulated flood hazard area.

## 2.7. Wetlands

Wetlands are lands that are inundated or saturated by surface or ground water 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. The repeated or prolonged presence of water at or near the soil surface is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Wetlands can typically be identified by the existence of three environmental parameters: a dominance of hydrophytic vegetation, hydric soils, and prolonged periods of inundation or saturation resulting in sufficient hydrology to support wetland development. Examples of types of wetlands include marshes, bogs, the shallow portions and shorelines of lakes, ponds, and reservoirs, seasonal wet meadows, and the floodplain and shoreline of streams.

The US Fish and Wildlife Service (USFWS) is the principal federal agency that provides information to the public on the extent and status of the Nation's wetlands. The USFWS has compiled mapping to show wetlands and deepwater habitats in the US including many parts of Montana and has made this mapping available through access to the National Wetland Inventory (NWI). NWI wetlands are identified in general accordance with USFWS's publication *Classification of Wetlands and Deepwater Habitats of the United States*[11]. Note that NWI maps do not define wetlands for regulatory purposes since the wetlands are identified through aerial photo interpretation. The NWI definition of wetlands requires one or more of the three attributes of wetlands (wetland hydrology, vegetation, or soils) be present to be a wetland.

Field-based wetland delineations would be required if improvement options are forwarded from the corridor study that could potentially affect wetlands. Future projects in the study area would need to incorporate project design features to avoid and minimize adverse impacts on surface waters and wetlands to the maximum extent practicable. Unavoidable impacts to wetlands, streams, and irrigation features may require compensatory mitigation in accordance with applicable US Army Corps of Engineers requirements. Various state and federal water quality permits may be required to implement

construction projects on US 191 including a MPDES General Permit for Storm Water Discharges Associated with Construction Activity; a Clean Water Act Section 404 permit. Section 401 Water Quality Certification and 318 Authorization; and a Stream Protection Act (SPA 124) permit.

NWI mapping for the study area is presented in **Figure A.8**. The figure shows primarily freshwater emergent wetlands and freshwater forested/shrub wetlands along the Gallatin River and other intermittent rivers, streams, and drainages.

## 2.8. Hazardous Substances

MDEQ works to clean up contaminated properties throughout the state. MDEQ also regulates underground storage tanks on properties owned by private businesses and public entities, ensuring that the tanks are installed, managed, and monitored in a manner that prevents releases into the environment. Information about the existence of hazardous sites in the study area was obtained from the Montana Natural Resource Information System database and from MDEQ's online interactive website and databases. **Figure A.9** depicts sites identified in the study area. **Tables B.2** through **B.6** contain more detailed information of the following discussion.

### National Priority List (Superfund) Sites

The National Priority List is the list of hazardous waste sites throughout the US eligible for long-term remedial action financed under the federal Superfund program. A Superfund site is any land that has been contaminated by hazardous waste and identified by the US Environmental Protection Agency (EPA) as a candidate for cleanup because it poses a risk to human health and/or the environment. No Superfund sites exist in or near the study area.

### Hazardous Waste Generators

There are no hazardous waste generators in the study area. However, there are two generators listed near the study area in Four Corners, Autoworks, Inc. and a facility owned by Gallatin County. The Gallatin County facility was closed in 2016.

### Hazardous Waste Release Sites

There are five hazardous waste release sites in the study area:

- The **NorthWestern Energy Non-PCB Oil Release** site in the Elk Grove Subdivision (RP 79.5) had a non-PBC transformer/dielectric oil (transformer oil) release in 2003 as the result of damage by a vehicle or vandalism. It was remediated and delisted in 2004.
- The **Horkley Oil Inc** hazardous waste release site is located at approximate RP 71. A diesel spill occurred in 1994, was cleaned, and later delisted in 1995.
- The **Gallatin Gateway Tanker Release** was a gasoline spill as a result of a crash involving a heavy truck vehicle at the mouth of Gallatin Canyon (RP 70.4). The site was listed in 1991 and delisted in 1993 following cleanup activities.
- The **Idaho Asphalt Supply** hazardous waste release site is located near Greek Creek (RP 59). Asphalt and diesel were spilled at the site in 1995. It was remediated and delisted in 1996.
- The **Southern Idaho Supply** is located at approximate RP 50. A spill of ammonium nitrate was reported in 1997 and subsequently delisted in 1998.

### Remediation Response Sites

The State Superfund Unit utilizes the Comprehensive Environmental Cleanup and Responsibility Act (CECRA) to investigate and clean up hazardous substances at sites not addressed by federal Superfund. Historical waste disposal activities at these sites caused contamination of air, surface

water, groundwater, sediments, and/or soils with hazardous or deleterious substances. Under CECRA, sites are ranked based on potential risks to human health and the environment. There were two remediation response sites identified within or near the study area:

- The **CMC Asbestos Gallatin Gateway** site is an inactive, railroad facility located near Gooch Hill Road (south of RP 77 on US 191) which was used for storage and transport of asbestos ore between 1927 and 1978. A large pile of asbestos ore was apparently abandoned at the site sometime in the 1950s. Since then, the site has remained vacant and evidence indicates dirt bikes were ridden over and around the ore pile, spreading the asbestos and causing it to become airborne. This site was identified as a hazardous waste release site in 1990 and was delisted in 1996 following cleanup activities.
- The **Karst Asbestos Mine** is located about a mile from US 191 at approximate RP 56 and is accessed by a foot trail. The 40-acre site is an abandoned asbestos mine that was worked periodically from the 1890s until 1976. Following preliminary assessment under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) in 1983, EPA declared the site as "No Further Action" primarily because of the minimal health risks and the relatively remote location. The site was delisted in 1984 and referred to the CECRA program. In response to citizen complaints, additional site assessment activities occurred in 1990 by State and USFS personnel. In 2001 the USFS collected samples and detected asbestos in one sample. The site's size and relative inaccessibility presents difficulty in determining viable reclamation options. The USFS, the lead agency, has rerouted trails to bypass the mine locations. MDEQ's site information shows CERCLA as the current lead program. Further assessment of MDT ROW may be necessary to determine impacts if any from historical transport from a nearby staging area at the base of the hill from the mine site. Ore stockpiles were used as a borrow source by local contractors and, as a result, Karst Asbestos ore has been found in county road approaches and under sidewalks in Bozeman. Undiscovered areas of Karst asbestos may be present throughout the study area.[12]

## Underground Storage Tanks

There are several underground storage tanks within the study area, some are active, and some are permanently out of use:

- Six active underground storage tanks exist at the **Town Pump in Four Corners** (RP 82), three are gasoline tanks and three are diesel tanks.
- There are eight active underground storage tanks and three tanks that are permanently out of use at the **Casey's Corner in Four Corners** (RP 82). Three of the active tanks are gasoline tanks, four are diesel tanks, and one contains Diesel Exhaust Fluid (DEF).
- There are three active underground storage tanks and four tanks that are permanently out of use at the **Thriftway Super Stops in Four Corners** (RP 82). Two of the active tanks contain gasoline and one tank contains diesel.
- There are five active underground storage tanks and five tanks that are permanently out of use at the **Casey's Corner in Gallatin Gateway** (RP 76.2). Three of the active tanks are gasoline tanks, and two are diesel tanks.
- There are three active underground storage tanks, one tank used for diesel fuel that is temporarily out of use, and five tanks that are permanently out of use at the **Conoco in Big Sky** (RP 48). Two of the active tanks are gasoline tanks, one is a diesel tank.
- There are three active underground storage tanks at **Casey's Corner in Big Sky** (RP 47.6). Two tanks contain gasoline and one contains diesel.

## Petroleum Tank Releases

There have been several petroleum tank releases in the past in and near the US 191 corridor. All of the claims filed for assistance from the Petroleum Tank Release Compensation Board and Cleanup Fund have been resolved:

- **Thriftway Super Stop** (Site 1605064), located in Four Corners (RP 82) was identified as the site of a petroleum release in 1999 and was resolved in 2002.
- **Buffalo Station** (Site 5614002) was identified as the site of a petroleum release in Gallatin Gateway (RP 75.8), the incident occurred in 2007 and was also resolved in 2007.
- **Elkhorn Ranch** (Site 1603427, located south of RP 71.7 on US 191) was identified as the site of a petroleum release in 1996 and was resolved in 1999.
- **Jasper's Big Sky Exxon** (Site 1606923) was identified as the site of a petroleum release in Big Sky (RP 47.6) in 1999 and was also resolved in 1999.
- **Frontier Construction** (Site 9995003) was identified as the site of a petroleum release in Big Sky (RP 47.4) in 2005 and was resolved in 2013.

## Abandoned and Inactive Mine Sites

There are several mining prospects or abandoned mines near the study area identified by the USGS, but only four exist in the study area. The sites include Bozeman Hot Springs geothermal site in Four Corners (RP 81.3); the Spanish Creek Resource Study gold prospect, located near Spanish Creek Road (RP 68.2); Deer Creek Prospect along Deer Creek containing copper and nickel commodities (RP 51.3); and an Unnamed Location north of Levinski Creek (RP 49.8) containing copper. The Karst Asbestos Mine, located just outside the study area, is an MDEQ Abandoned Mine Priority Site. Two mining features identified by USGS have also been located in the study area: an open pit mine/quarry just north of Williams Road (RP 72) and an adit near Hell Roaring Creek (RP 64). Several lode, placer, and millsite mining claims mapped by the Bureau of Land Management (BLM) also exist in the study area. All claims within the study area are closed.

## Opencut Permits

Opencut permits are permits required for the mining and processing of materials specified in the Opencut Mining Act (e.g. sand, gravel, soil, bentonite, clay, scoria, and peat). Three permitted opencut mine sites exist in the study area as well as several past or in process permits. A pre-application request was recently filed for a site, **Simpson** (Site 2866), located just south of Cobb Hill Road (RP 81). The permitted **Morgan Family LLC** (Site 1737) site is located just north of Zachariah Lane (RP 78) and is currently operated by TMC Inc. A site just north of Cottonwood Road (RP 76), **Gateway Pit** (Site 2520), is operated by Gateway Village LLC and has a voided permit. The permitted **Ponderosa** (Site 2815) site, operated by Kenyon Noble Ready Mix, is located just south of Lone Mountain Trail (RP 47.7). The **Big Sky Pit** (Site 618), operated by Portable Inc. and located south of Lone Mountain Trail (RP 47.6), has completed reclamation and the opencut permit has been released. The permitted **Section 5 North** (Site 3023) site is operated by TMC Inc. near Frenchman Road (RP 47.4). A permit at the same location (**Section 5 North**, Site 1414) operated by Knife River-Belgrade has completed reclamation and has been released. A third site at the same location (**Section 5 North**, Site 2861) has a permit pending.

## Landfills

There are no active landfills in the study area.

## 2.9. Air Quality

The *Clean Air Act* of 1970, as amended, is the basis for air pollution control programs. In accordance with the Act, the EPA established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: ozone, carbon monoxide, particulate matter (PM-2.5 and PM-10), lead, sulfur dioxide, or nitrogen dioxide. The NAAQS are health-based standards to protect human health and public welfare and set allowable concentrations and exposure limits for each criteria pollutant.

Montana has also established air quality standards for criteria pollutants, as well as for settleable particulates and visibility. The Montana Ambient Air Quality Standards (MAAQS) – found in the Administrative Rules of Montana 17.8.210-17.8.230 – establish statewide targets for acceptable levels of ambient air pollutants.

The EPA and the MDEQ are charged with regulating air quality and may designate areas as attainment or nonattainment based on their history of meeting the NAAQS or MAAQS for pollutants of concern. Areas where air pollution levels do not exceed the air pollution thresholds established in the NAAQS are designated as “attainment” areas. “Nonattainment areas" are localities where air pollution levels persistently exceed the NAAQS or MAAQS, or that contribute to ambient air quality in a nearby area that fails to meet standards. An area that has been designated as nonattainment in the past, but that now complies with the NAAQS, is classified as a “maintenance” area.

Gallatin County is currently considered an attainment area for all pollutants, and as such proposed transportation projects would likely not be subject to conformity requirements. However, if the area’s air quality changes, conformity requirements could be implemented in the future. Any project proposed by MDT would need to examine the current status and determine if the project is subject to conformity requirements.

## 2.10. Noise

Roadway projects can cause noise levels to increase for affected receivers, during project construction and/or from operation of the traffic facility. Noise impacts can potentially occur due to construction of a roadway on a new location or the physical alteration of an existing roadway which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes.

Residences in the study area are sensitive noise receptors that could be affected by roadway improvements on US 191. Sites protected under 4(f) and 6(f) within the study area may also be considered sensitive noise receptors. Improvements on US 191 will likely require a noise analysis. Detailed noise analyses are often conducted when the potential for noise impacts exists due to substantial changes in roadway design or configuration.

Construction activities associated with improvements to US 191 may result in localized and temporary noise impacts in the vicinity of residences. These impacts can be minimized by incorporating measures to control of noise sources during construction.

# 3.0. BIOLOGICAL RESOURCES

## 3.1. Vegetation

In the US 191 corridor, vegetation below tree line consists of coniferous forest, grasslands, shrublands, and willow and aspen groves in the riparian areas. The coniferous forest community is dominated by conifers such as lodgepole pine and Douglas fir but also contains Engelmann spruce, and subalpine fir. Big sagebrush dominates the grassland shrubland community, with other co-dominant shrubs including silver sagebrush, antelope bitterbrush, three tip sagebrush, Idaho fescue, spike fescue, and poverty oatgrass. The riparian community is dominated by black cottonwood, aspen, snowberry, Wood's rose, white spirea, red-osier dogwood, pacific willow, sandbar willow, reed canarygrass, and smooth scouring rush. Areas of cultivated crop land and developed lands are also present in the study area, primarily from Four Corners to the mouth of Gallatin Canyon.

**Table 3.1** presents the land cover composition along the US 191 corridor as determined by the Montana National Heritage Program's (MTNHP) Environmental Summary prepared for the study area (**Appendix D**). Note that other sub-systems exist but each cover less than 1% of the study area and are not included in the table. Refer to **Appendix D** for more information.

**Table 3.1: US 191 Land Cover – 0.25-mile buffer**

| System/Sub-System | (%) |
|---|---|
| **Forest and Woodland Systems** | **44%** |
| Rocky Mountain Montane Douglas-fir Forest and Woodland | 25% |
| Rocky Mountain Lodgepole Pine Forest | 10% |
| Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland | 4% |
| Aspen Forest and Woodland | 4% |
| Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | 1% |
| **Shrubland, Steppe and Savanna Systems** | **10%** |
| Montane Sagebrush Stepp | 8% |
| Rocky Mountain Subalpine Deciduous Shrubland | 1% |
| Rocky Mountain Montane-Foothill Deciduous Shrubland | 1% |
| **Grassland Systems** | **10%** |
| Rocky Mountain Lower Montane, Foothill, and Valley Grassland | 6% |
| Rocky Mountain Subalpine-Montane Mesic Meadow | 3% |
| Rocky Mountain Subalpine-Upper Montane Grassland | 1% |
| **Wetland and Riparian Systems** | **10%** |
| Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland | 5% |
| Alpine-Montane Wet Meadow | 4% |
| Open Water | 1% |
| **Human Land Use** | **22%** |
| Cultivated Crops, Pasture/Hay | 10% |
| Developed, Open Space | 4% |
| Roads/Major Roads | 4% |
| Low Intensity Residential | 3% |
| Commercial / Industrial | 1% |
| **Recently Disturbed or Modified** | **2%** |
| Insect-Killed Forest | 1% |
| Introduced Upland Vegetation – Annual and Biennial Forbland | 1% |
| **Sparse and Barren Systems** | **1%** |
| Rocky Mountain Cliff, Canyon and Massive Bedrock | 1% |

### 3.1.1. Noxious Weeds

Invasive weeds are a growing concern in Gallatin County and throughout Montana. The *Gallatin County Noxious Weed Management Plan*[13] details a program to manage noxious weeds in the county to protect open space, natural, and agricultural resources. There are nearly 30 species of noxious weeds present in Gallatin County, nearly all of the noxious weed species are expected to occur in the study area. About two-thirds have been observed in the area according to Environmental Summary compiled by MTNHP (**Appendix D**).

According to the *MDT Threatened and Endangered Species and Biological Resources Report*[14] dated 2002, spotted knapweed (degree of infestation in project corridor: patchy throughout) and Canada thistle (degree of infestation in project corridor: infrequent), are species of noxious weeds which are of greatest concern in Gallatin Canyon. Concerns about infestations of spotted knapweed in many areas adjacent to Highway 191 through the canyon and the potential for expansion of hound's tongue, yellow toadflax, sulfur cinquefoil, common tansy, and oxeye daisy have been expressed by the USFS. If improvement options are forwarded from the feasibility study, field surveys for noxious weeds should take place before any ground disturbance occurs. Proposed projects should incorporate applicable best management practices outlined by the Gallatin County Weed Control District and MDT Standard Specifications. Any projects forwarded from the feasibility study within the National Forest would need to comply with USFS management policies.

## 3.2. Biological Community

The historic conversion of previously native riparian and foothill habitat to agricultural operation and, more recently, to commercial and residential developments between Four Corners and the mouth of the Gallatin Canyon has negatively impacted the quantity and quality of wildlife habitat available in this area. Wildlife species found in this portion of the study area are considered "generalist species", meaning they are adapted to a wide range of environmental circumstances and food sources. For this reason, the generalists occurring in the area (e.g. deer, small mammals, and occasionally black bears) are more tolerant of human activities and disturbances.

Development densities decrease south of Gallatin Gateway and the area transitions to a more rural, agricultural environment with open space and dispersed residences transitioning into the foothills. Common wildlife in the area include rodents (moles, voles, ground squirrels, gophers, mice), foxes, skunks, deer, porcupines, coyotes, and a diverse bird community. Reptiles and amphibians observed in the area include gartersnakes, western milksnake, and common frogs and toads.

Other rarer, more wary, or specialist, species (e.g. moose, mountain lion, elk, wolf) that may have once inhabited the area in greater numbers no longer do so in higher densities, indicating that they are likely less tolerant to the development and conversion of formerly suitable habitat areas to anthropogenic use, and because they are not typically well-tolerated by humans. In developed areas grizzly bears are not generally well tolerated by humans due to potential human safety concerns and property damage. However, even with increasing human development in the Gallatin Canyon, grizzly bear use, density and distribution are increasing in the Gallatin Canyon.

The more generalist wildlife species that remain in higher numbers, continue to be affected by the development seen in the northern portion of the US 191 corridor. The loss of agricultural land by continued commercial and subdivision development in the area further fragments and reduces the quality of remaining wildlife habitat. Roads and their associated traffic can inhibit wildlife movements and contribute to wildlife mortality in the area. More specific information about highway-related wildlife mortalities is presented later in this section.

The Gallatin River riparian corridor provides important wildlife habitat in areas that have been less impacted by adjacent development. Common wildlife includes those found in the adjacent shrub/woodlands and grasslands, and species frequenting riparian areas like bats, martens, weasels, and raccoons. The riparian zone provides habitat for ducks, geese, herons, and eagles, other raptors, as well as migratory songbird species found in the adjacent non-riparian areas. Common riparian species include painted turtles, northern leopard frogs, and western toads. In addition, the Gallatin Canyon provides forested and riverine habitat for a variety of Montana wildlife species including large ungulates, carnivores, small mammals, raptors, amphibians, reptiles, and aquatic species.

The Gallatin Range provides suitable habitat for elk, moose, mountain goats, and bighorn sheep because of its relatively large size, its relatively diverse and high-quality vegetative communities and elevational relief, its geographic location and connectivity to other habitats, and its relatively low level of human development. In addition to providing habitat for resident wildlife, the Gallatin Range plays a role in maintaining habitat connectivity for wide-ranging wildlife species such as wolverine, lynx, grizzly bear, mountain lion, and wolf. The Gallatin Range represents the northern reaches of core wildlife habitat within the Greater Yellowstone Ecosystem, and the northern end of the range forms a possible linkage to a wildlife corridor that may connect the Greater Yellowstone Ecosystem to the Northern Continental Divide Ecosystem.[15] Grizzly bears currently occupy the entire Gallatin and Madison Ranges which are the boundaries of the Gallatin Canyon.

### 3.2.1. Mammals

The general and wintering distributions of the larger mammals in the study area including mule and whitetail deer, elk, moose, mountain goats, and bighorn sheep are depicted in **Figures A.10** through **A.12**. Montana Fish, Wildlife and Parks (MFWP) mapping shows the entire study area provides general range for whitetail deer and winter range for mule deer. The area along the corridor from Gallatin Gateway south to the end of the study area provides winter range for elk and both general and winter ranges for moose. The Gallatin Canyon provides general range for mountain goat and bighorn sheep populations. General ranges for mountain lions, gray wolves, and black bears encompass the entire study corridor and surrounding area and are therefore not shown in the distribution maps.

The Swan Creek elk herd primarily occupies the west side of the Gallatin Range and only occasionally moves into proximity of the highway. The northern portion of the canyon to Gallatin Gateway supports a lot of elk activity although the behavior is not documented as migratory or seasonal movements across the highway. Elk from the Spanish Peaks may move close to the highway on occasion and may cross near the mouth of the canyon. The Big Sky area provides the northern limits of the historic Gallatin elk herd's winter range, which extends down to Yellowstone National Park primarily along the east side of US 191. This herd has been studied since 1919 and is currently below population objective. Up to 300 elk spend the winter on the Gallatin Wildlife Management Area and Levinski Ridge to the north, occasionally crossing the highway and river between MT 64 (RP 48) and Jack Smith Bridge (RP 49.8). Both sides of US 191 south of Big Sky provide core winter range for this elk herd which frequently crosses US 191 into the Big Sky subdivisions near Michener Creek. Improved highway permeability for elk movement south of Big Sky is something MFWP would like to consider.

The portion of the study area between Karst's Camp (RP 55.2) and MT 64 (RP 48.0) has been identified by MFWP as an area of concern for road mortality of big horn sheep. The Spanish Peak big horn sheep population occupies habitat year-round to the west of US 191 just north of MT 64. These sheep come down to the highway for salt and other minerals, and to the river for water. These animals are believed to congregate in the roadside environment and are not actually attempting to cross US 191 for the purposes of seasonal or dispersal movement.

A review of the MDT Maintenance Animal Incident Database between January 1, 2009 and December 31, 2018 indicates that 1,247 animal carcasses were collected and documented along the study corridor. The database contains information on carcasses collected by MDT maintenance personnel; however not all carcass collection is reported consistently or on a regular schedule. This makes the information useful for pattern identification, but not statistically valid.

**Table 3.2** summarizes the large mammal carcasses collected over the 10-year period. **Figures A.13** and **A.14** show the locations of large mammal carcasses and clusters of deer carcasses, respectively. Note that a carcass location does not necessarily correspond to a crash occurrence or crash location.

**Table 3.2: Animal Carcasses Collected**

| Animal | # of Carcasses Collected | (%) |
|---|---|---|
| Whitetail Deer | 1,017 | 82.0% |
| Mule Deer | 99 | 8.0% |
| Deer (Unknown Species) | 3 | 0.2% |
| Elk | 77 | 6.2% |
| Moose | 13 | 1.0% |
| Bighorn Sheep | 12 | 1.0% |
| Black Bear | 2 | 0.2% |
| Other Wild Animal | 7 | 0.6% |
| Unknown | 10 | 0.8% |
| TOTAL | 1,240 | 100% |

Deer accounted for the vast majority (90.0%) of the carcasses collected along this section of US 191, with whitetail deer being the most common species involved. As shown in **Figures A.13** and **A.14**, the following trends were seen with the locations of carcasses collected:

- **Whitetail Deer:** Collected throughout study area, but carcass collection was concentrated north of the Gallatin Canyon between RP 64 and 82.
- **Mule Deer:** Carcasses collected throughout the entire study area.
- **Elk:** Concentrated in two locations: RP 70 to 76 north of the canyon, and RP 45 to 50 around the US 191/MT 64 intersection.
- **Moose:** In the heart of the canyon between RP 49 and RP 67
- **Bighorn Sheep:** Carcasses were collected at several locations between RP 48 and 53, with a concentration of carcasses between RP 52 and 53.

**Figure 3.1** shows the number of carcasses collected by month and by year. As shown in the graphs, animal mortality is greater in winter months (October through February) with the most carcasses being collected in January and December. Based on the relatively few carcasses collected of each individual species, besides deer and elk, it is difficult to identify distinct trends in seasonal variation. The number of carcasses collected each year seemed to be decreasing, with some variation, between 2009 and 2017. However, a large increase in carcasses collected was realized in 2018. Nearly double the carcasses were collected in 2018 than in 2017 (150 versus 80). As of November 1, 2019, 117 carcasses have been reported in the study area for 2019. Any improvement projects brought forward should utilize the most relevant and recently available data (e.g. salvage permits, MFWP databases) to investigate carcass retrieval and animal mortality in the corridor.

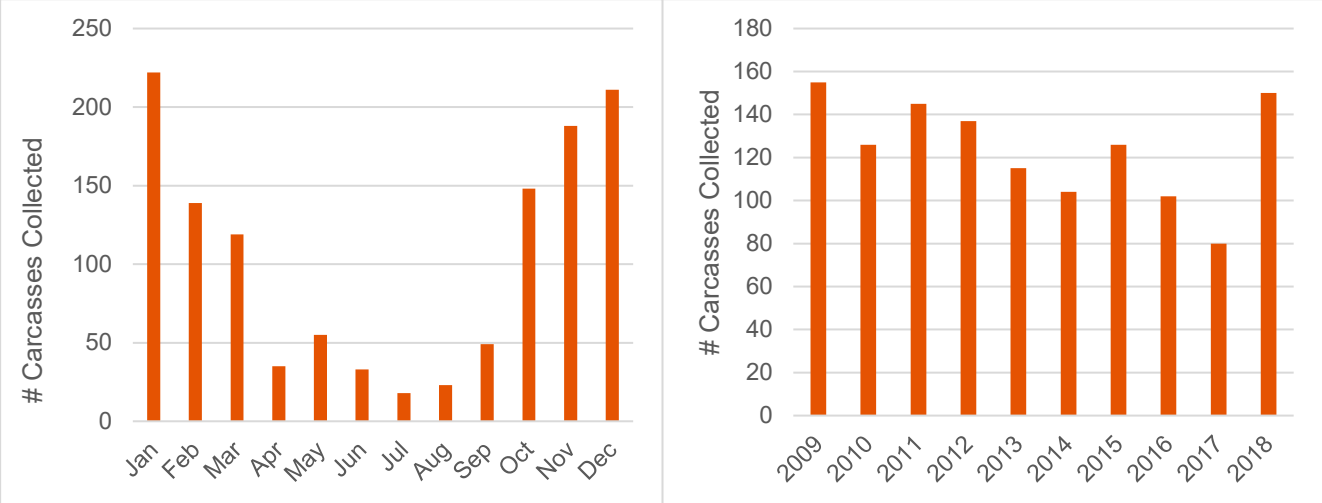



**Figure 3.1: Seasonal and Yearly Distribution of Carcasses Collected**

If any improvement projects are brought forward from the corridor study, project planners should coordinate with fish and wildlife biologists from MFWP, USFWS, and the USFS to gain further insight into issues related to the management of these species, as well as measures for avoiding, minimizing, or mitigating adverse effects on species and habitat. The needs and feasibility of wildlife accommodations will need to be considered in projects forwarded from this study in accordance with MDT's Wildlife Accommodation Process.

### *3.2.2. Birds*

According to the MTNHP database, more than 200 species of birds have been documented in Gallatin County, with the potential for many of these birds to occur or reside in the study area. These species include a wide variety of songbirds, birds of prey, waterfowl, owls, and shorebirds, including several listed as SOC. Most avian observations occur in the riparian areas, open lands, and forest lands along the study area.

Many of the bird species are protected under or included in the USFWS *Migratory Bird Treaty Act* (MBTA), *Birds of Conservation Concern 2008* (BCC), or *Bald and Golden Eagle Protection Act of 1940* (16 U.S.C. 668-668c) (BGEPA) listings. Any improvements forwarded from this study should consider potential constraints that may result from nesting times of migratory birds and/or the presence of bald and golden eagle nests.

Migratory birds are protected under the MBTA. Under the MBTA, it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Direct disturbance of an occupied (with birds or eggs) nest is prohibited under the law. The destruction of unoccupied nests of eagles; colonial nesters such as cormorants, herons, and pelicans; and some ground/cavity nesters such as burrowing owls or bank swallows may be prohibited under the MBTA.

The BCC includes birds identified by USFWS as "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA)." The study area is located in Bird Conservation Region 10. There are six species included under BCC that are documented as having a sustained presence in or

are known to occur in the study area: bald eagle, golden eagle, peregrine falcon, Cassin's finch, long-billed curlew, and black swift.

Bald eagles and golden eagles are known to occur in the study area. There are two confirmed golden eagle nesting areas and three bald eagle nesting areas located in the vicinity of the study area (see **Figure A.16**). Peregrine falcons have also been observed in the general project area and throughout the canyon. Peregrines have been documented to use old golden eagle nests. The bald eagle is a Montana special status species (SSS) which has some legal protections in place but is otherwise not a SOC. Bald and golden eagles are both protected by the MBTA and managed under the BGEPA. The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle or golden eagle, alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

### 3.2.3. Fisheries

The Gallatin River is the major water body which parallels and is crossed by US 191 within the study area. The Gallatin River and its tributaries support a variety of Montana native and game fish. **Table 3.3** depicts the streams crossed by the highway and fish distribution information currently available from the MFWP's FishMT database.[16] Note the MFWP retired the Montana Fisheries Information System (MFISH) in July 2017 and replaced it with the FishMT database. It is possible that MFISH data for some streams crossed by US 191 may exist, but the information has not yet been migrated to the new FishMT database.

**Table 3.3: Fish Distribution Data for US 191 Stream and River Crossings**

| Name | Location (MP) | Existing Structure | Fish Species Present |
|---|---|---|---|
| **Dry Creek** | 81.5 | Culvert | Longnose Dace, Mottled Sculpin |
| **South Cottonwood Creek** | 76.8 | Bridge | Brook Trout, Brown Trout, Longnose Dace, Mottled Sculpin, Rainbow trout |
| **Big Bear Creek** | 73.8 | Culvert | Brook Trout, Longnose Dace, Mottled Sculpin, Yellowstone Cutthroat Trout |
| **Wilson Creek** | 72.9 | Culvert | Brown Trout |
| **Gallatin River** | 70.6 | Bridge | Brook Trout, Brown Trout, Longnose Dace, Mottled Sculpin, Mountain Whitefish, Rainbow Trout, White Sucker, Westslope Cutthroat Trout, Yellowstone Cutthroat Trout |
| | 61.5 | Bridge | |
| | 49.9 | Bridge | |
| **Spanish Creek** | 68.3 | Bridge | Brook Trout, Brown Trout, Mottled Sculpin, Mountain Whitefish, Rainbow Trout |
| **Logger Creek** | 65.0 | Culvert | No Data |
| **Hell Roaring Creek** | 64.5 | Culvert | Mottled Sculpin, Rainbow Trout, Yellowstone Cutthroat Trout |
| **Cave Creek** | 61.9 | Culvert | No Data |
| **Greek Creek** | 58.1 | Culvert | No Data |
| **Swan Creek** | 57.4 | Bridge | Brook Trout, Rainbow Trout. Westslope Cutthroat Trout |
| **Moose Creek** | 56.0 | Culvert | Westslope Cutthroat Trout |
| **Tamphery Creek** | 54.0 | Culvert | No Fish Caught in 07/12/17 Survey |
| **Portal Creek** | 53.3 | Culvert | Westslope Cutthroat Trout |
| **Goose Creek** | 51.9 | Culvert | No Data |
| **Dudley Creek** | 48.9 | Culvert | No Fish Caught in 07/14/16 Survey, Westslope Cutthroat Trout |

| Name | Location (MP) | Existing Structure | Fish Species Present |
|---|---|---|---|
| **West Fork Gallatin River** | 48.1 | Bridge | Brook Trout, Mottled Sculpin, Mountain Whitefish, Rainbow Trout |
| **Michener Creek** | 47.1 | Culvert | No Data |
| **Beaver Creek** | 45.2 | Culvert | Mottled Sculpin, Rainbow Trout |

Fish passage and/or barrier removal opportunities may need to be considered at affected drainages if a project is forwarded from this study. Permit conditions from regulatory and resource agencies may also require incorporation of design measures to facilitate aquatic species passage.

### *3.2.4. Amphibians, Reptiles, and Invertebrates*

According to the MTNHP Environmental Summary (**Appendix D**), amphibian and reptile species known or expected to occur in the study area include but are not limited to the western toad, northern leopard frog, western milksnake, greater short-horned lizard, and snapping turtle. Nearly 30 invertebrate species, many of them listed as Montana Species of Concern (SOC), have also been observed or are expected to occur in the study area.

## 3.3. Threatened and Endangered Species

Section 7(a)(2) of the ESA of 1973, as amended, requires federal agencies to review actions they authorize, fund, or carry out, and to ensure such actions do not jeopardize the continued existence of federally listed species, or result in the destruction or adverse modification of designated critical habitat. **Table 3.4** shows the ESA listed species for Gallatin County (as of October 23, 2018) as defined by the USFWS Ecological Services Montana Field Office.

**Table 3.4: Threatened and Endangered Species – Gallatin County**

| Species | Federal Status | Typical Habitat |
|---|---|---|
| **Canada Lynx** (*Lynx canadensis*) | **Listed as Threatened** *Critical Habitat generally designated east of US 191 on USFS lands in the Gallatin Canyon* | The Canada lynx is an elusive forest-dwelling cat of northern latitudes. The Canada lynx are closely associated with moist, cool, boreal spruce-fir forests, and landscapes with high densities of snowshoe hares. Suitable habitat includes subalpine forests at elevations ranging between 4,000 and 7,000 feet above sea level. Lynx also need persistent deep, powdery snow, which limits competition from other predators. |
| **Grizzly Bear** (*Ursus arctos*) | **Listed as Threatened** | In Montana, grizzly bears primarily use meadows, seeps, riparian zones, mixed shrub fields, closed timber, open timber, sidehill parks, snow chutes, and alpine slabrock habitats. Habitat use is highly variable between areas, seasons, local populations, and individuals. Gallatin Canyon lies within the area occupied by the Greater Yellowstone Ecosystem Grizzly Bear Population. The entire Gallatin Canyon is in Demographic Monitoring Area (DMA) for Yellowstone grizzly bears, with the southern portion of the canyon in the original grizzly bear recovery zone (RZ). |
| **Wolverine** *(Gulo gulo)* | **Proposed for Listing** | In North America, wolverines occur within a wide variety of habitats, primarily high elevation boreal forests, tundra, and western mountains throughout Alaska and Canada; however, the southern portion of the range extends into the contiguous United States, including Montana. South of the Canadian border, wolverines are restricted to areas in high mountains, near the tree-line, where conditions are cold year-round and snow cover persists well into the month of May. When inactive, wolverines occupy dens in caves, rock crevices, under fallen trees, in thickets, or similar sites. |

| Species | Federal Status | Typical Habitat |
|---|---|---|
| **Whitebark Pine** *(Pinus albicaulis)* | **Candidate for Listing** | Whitebark pine is a non-commercial conifer occurring primarily on federally owned or managed lands in the United States. Whitebark pine is typically found in cold, windy, high elevation or high latitude sites in western North America and as a result, many stands are geographically isolated. |
| **Ute Ladies' Tresses** *(Spirantes diluvalis)* | **Listed as Threatened** | Ute ladies' tresses is a perennial, terrestrial orchid that occurs in alkaline wetlands, swales, and old meander channels often on the edge of the wetland or in areas that are dry by midsummer. Habitat is limited to areas within major river drainages. |

All three of the listed wildlife species have been observed and documented as having a sustained presence within the study area based on information from the MTNHP. The whitebark pine has been observed near the study corridor, however, there is uncertainty associated with some common data sources for this species and it is unlikely that the species is present within the 0.25-mile area surrounding US 191. Ute ladies' tresses is known to occur in southwest and south-central Montana in the Missouri, Jefferson, Beaverhead, Ruby and Madison River drainages but has not been observed in the Gallatin River drainage. **Figure A.15** shows the occurrences of threatened and endangered species within a one-mile area surrounding US 191.

All of the species shown in **Table 3.4** appear on the ESA listed species for the Custer Gallatin National Forest (as of July 29, 2019). Listed ESA species for the Custer Gallatin National Forest also include the Whooping Crane, Northern Long-eared Bat, and Western Glacier Stonefly; however, MTNHP data shows no occurrences of these species near the study area.

Any improvements forwarded from the corridor study would need to undergo review for compliance with the provisions of the ESA. The listing status of species and critical habitat can change over time; therefore, an up-to-date list of potentially affected species and designated critical habitat should be reviewed for each project.

## 3.4. Other Species of Concern

MTNHP maintains a database of SOC in Montana. SOC are native animals or plants that are at-risk due to declining population trends, threats to their habitats, and restricted distribution, among other factors. Designation as a SOC is based on the Montana Status Rank and is not a statutory or regulatory classification. Rather, these designations provide information that helps resource managers make proactive decisions regarding species conservation and data collection priorities.

Federal status is designated by three entities: USFWS, BLM, and USFS. USFWS status reflected the ESA listings as well as those species protected under or included in the MBTA, BCC, or BGEPA listings. The BLM designates species listed in three ways, as threatened or endangered under the ESA, or as Sensitive on BLM lands. The USFS has six designations: endangered, threatened, proposed, or candidate on the ESA, sensitive species on USFS lands, or a Species of Conservation Concern (SCC). A SCC is a species that is not recognized by the ESA, but available data indicates substantial concern about the species' capability to persist over the long-term in the area.

Montana employs a standardized ranking system to denote state status. Species are assigned numeric ranks ranging from 1 (highest risk, greatest concern) to 5 (demonstrably secure), reflecting the relative degree of risk to the species' viability, based upon available information.

**Table 3.5** presents the all of species occurrence records within 0.25 miles of US 191 and their federal status, state rank (SOC, SSS, and potential species of concern [PSOC]), and state status. A species occurrence is an area of land or water in which a species is, or was, present. Species observations are reviewed by MTNHP for evidence of sustained presence (for example, breeding evidence) and species occurrences are created from those that meet established criteria for species. Note that other species have been observed in the US 191 study area (see **Appendix D**) but have not been documented as a species occurrence within the study area. **Figure A.16** shows the locations of the SOC species occurrences within a one-mile buffer around the study corridor.

### Table 3.5: Montana Species of Concern – Species Occurrence in Study Area

| Species | | USFWS Status | BLM Status | USFS Status | State Status/Rank |
|---|---|---|---|---|---|
| **Mammals** | **Wolverine** *(Gulo gulo)* | Proposed | Sensitive | Proposed | SOC / 3 |
| | **Little Brown Myotis** *(Myotis lucifugus)* | None | None | None | SOC / 3 |
| | **Canada Lynx** (*Lynx canadensis*) | Threatened/ Critical Habitat | Threatened | Threatened/ Critical Habitat | SOC / 3 |
| | **Grizzly Bear** (*Ursus arctos*) | Listed Threatened | Threatened | Threatened | SOC / 2-3 |
| | **Hoary Bat** *(Lasiurus cinereus)* | None | None | None | SOC / 3 |
| | **Townsend's Big-eared Bat** *(Corynorhinus townsendii)* | None | Sensitive | Sensitive | SOC / 3 |
| **Birds** | **Clark's Nutcracker** *(Nucifraga columbiana)* | MBTA | None | None | SOC / 3 |
| | **Peregrine Falcon** *(Falco peregrinus)* | MBTA / BCC | Sensitive | Sensitive | SOC / 3 |
| | **Great Blue Heron** *(Ardea herodias)* | MBTA | None | None | SOC / 3 |
| | **Golden Eagle** *(Aquila chrysaetos)* | BGEPA / MBTA | Sensitive | None | SOC / 3 |
| | **Bald Eagle** *(Haliaeetus leucocephalus)* | BGEPA / MBTA / BCC | Sensitive | Sensitive | SSS / 4 |
| | **Pacific Wren** *(Troglodytes pacificus)* | MBTA | None | None | SOC / 3 |
| **Fish** | **Westslope Cutthroat Trout** *(Oncorhynchus clarkii lewisi)* | None | Sensitive | Sensitive | SOC / 2 |
| **Amphibians** | **Western Toad** *(Anaxyrus boreas)* | None | Sensitive | Sensitive | SOC / 2 |
| **Vascular Plants** | **Whitebark Pine** *(Pinus albicaulis)* | Candidate | Sensitive | Candidate | SOC / 3 |
| | **Slender Indian Paintbrush** *(Castilleja gracillima)* | None | None | None | SOC / 2 |
| | **High Northern Buttercup** *(Ranunculus hyperboreus)* | None | None | None | PSOC / 3-4 |
| **Invertebrates** | **Striate Disc** *(Discus shimekii)* | None | None | None | SOC / 1 |
| | **Alberta Snowfly** *(Isocapnia integra)* | None | None | None | SOC / 2 |
| | **Gallatin Mountainsnail** *(Oreohelix Yavapai mariae)* | None | None | None | SOC / 1 |
| **Other** | **Bat Roost (Cave)** | N/A | None | None | Not Yet Ranked |

If any projects are brought forward from the feasibility study, a thorough review of wildlife occurrence databases should be conducted, and habitats near any proposed project sites should be evaluated to determine their suitability for any SOC. Measures to avoid or minimize disturbance of these species or their habitat should be incorporated into project design and implementation.

# 4.0. SOCIAL AND CULTURAL RESOURCES

## 4.1. Demographic and Economic Conditions

NEPA/MEPA directs federal, state, and local agencies to assess potential social and economic impacts anticipated from proposed actions. Guidelines recommend consideration of impacts to neighborhoods and community cohesion, social groups including minority populations, and local and/or regional economies, as well as growth and development that may be induced by transportation improvements. Demographic and economic information presented in this section is intended to assist in identifying populations that might be affected by improvements in the study area. **Table 4.1** summarizes recent population and demographic data for the Four Corners Census Designated Place (CDP), Gallatin Gateway CDP, Big Sky CDP, Gallatin County, and Montana obtained from the 2013 to 2017 American Community Survey (ACS) 5-Year Estimates[17]. A CDP is a concentration of population defined by the United States Census Bureau for statistical purposes only.

**Table 4.1: Population and Demographic Data**

| | | Four Corners CDP | Gallatin Gateway CDP | Big Sky CDP | Gallatin County | Montana |
|---|---|---|---|---|---|---|
| **Population** | | 4,051 | 892 | 2,904 | 100,733 | 1,029,862 |
| **Race/Ethnic Characteristics** | **White (not Hispanic or Latino)** | 95.1% | 94.9% | 87.9% | 92.3% | 86.6% |
| | **Hispanic or Latino** | 0.6% | 4.0% | 7.7% | 3.3% | 3.6% |
| | **Black or African American** | 0.6% | 0.0% | 0.7% | 0.3% | 0.4% |
| | **American Indian or Alaska Native** | 0.0% | 0.3% | 0.4% | 0.9% | 6.2% |
| | **Asian** | 0.0% | 0.0% | 0.6% | 1.3% | 0.7% |
| | **Native Hawaiian and Other Pacific Islander** | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% |
| | **Some Other Race** | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | **Two or more races** | 3.8% | 0.9% | 2.8% | 1.9% | 2.4% |
| **Economic Characteristics** | **Median Household Income** | $81,550 | $64,417 | $80,551 | $59,397 | $50,801 |
| | **Persons below poverty level** | 5.5% | 11.1% | 14.2% | 13.0% | 14.4% |
| | **Unemployment rate** | 1.7% | 7.7% | 4.2% | 4.3% | 4.8% |

In general, the population composition is similar for each geography with a few notable differences. Persons identifying as Hispanic or Latino make up 7.7 percent of the population in the Big Sky CDP but only 0.6 percent of the Four Corners CDP population. In the Gallatin Gateway CDP, Gallatin County, and Montana the Hispanic or Latino population accounts for about 3.5 to 4.0 percent of the total population. The percentage of the population identifying as American Indian or Alaska Native is less in the CDPs and Gallatin County (less than 1 percent) as compared to Montana (6.2 percent). For all other races, the communities, county, and state have comparable population distributions.

Median household income for residents in each of the communities is higher than both county and state median values. The median income for residents in the Four Corners and Big Sky CDPs is approximately $81,000, 60 percent more than all households in Montana and 37 percent more than all households in Gallatin County. The median income for residents in the Gallatin Gateway CDP is about 27 percent more than households in Montana and 8 percent more than households in the county. The unemployment rate is lowest in the Four Corners CDP (1.7 percent) and highest in the Gallatin Gateway CDP (7.7 percent). For all other geographies the unemployment rate is approximately 4.5 percent. The percent of the population below poverty level is highest in Montana

(14.4 percent) followed by the Big Sky CDP (14.2 percent), Gallatin County (13.0 percent), Gallatin Gateway CDP (7.7 percent), and Four Corners CDP (1.7 percent).

Gallatin County's economy is strong and growing. Historically, the county's economy was driven by agriculture but now the county thrives on tourism, technology industries, and educational opportunities. The county boasts rapid, consistent growth in both size and quality over the past several years. Future job growth over the next ten years is predicted to be nearly 50 percent, much higher than the national average. The largest industries in Gallatin County are educational services, retail trade, and health care and social assistance. The highest paying industries are utilities, mining, quarrying, and oil and gas extraction, and professional, scientific, and technical services.

### *4.1.1. Environmental Justice*

Title VI of the *United States Civil Rights Act of 1964* prohibits recipients of federal financial assistance (states, grantees, etc.) from discriminating based on race, color, or national origin in any program or activity. In 1994, EO 12898 was issued to direct Federal agencies to incorporate achieving environmental justice into their mission. Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

In order to better meet the EPA's responsibilities related to the protection of public health and the environment, the EPA has developed a new environmental justice mapping and screening tool called EJSCREEN. It is based on nationally consistent data and an approach that combines environmental and demographic indicators in maps and reports.

If improvement options are forwarded from this study into project development, environmental justice would be evaluated during the project development process. However, the EJSCREEN report (**Appendix E**) indicates that minority and/or low-income populations are unlikely to be adversely affected by projects that may be forwarded from the corridor study. This conclusion is supported by the fact that most EJSCREEN environmental and demographic indicator values for the US 191 corridor are below comparable values for the State of Montana, EPA Region, and the Nation.

## 4.2. Recreational Resources

The US 191 corridor provides direct access to the Custer Gallatin National Forest and indirect access to the Beaverhead-Deerlodge National Forest. The area is highly used by recreationists for hiking, backpacking, camping, rock climbing, rafting, kayaking, fishing, hunting, wildlife viewing, and more. The Bozeman Hot Springs, the Big Sky Resort, Moonlight Basin, and Yellowstone Club ski areas, as well as several private campgrounds and guide-services, are also accessible via the study corridor. The use of lands accessed by US 191 provides substantial tourism traffic and economic subsistence for local outfitters and the rural communities along the corridor. A map of the recreation facilities within the study area are shown in **Figure A.17**.

Several USFS designated trails, campgrounds, day use areas exist along the US 191 corridor and are shown in **Table 4.2**. Additionally, an MFWP designated Fishing Access Site (FAS) and the Gallatin WMA are located within the study area. Athletic facilities at Ophir School and Lone Mountain High School also exist near US 191 in the southern portion of the study area. Additional USFS trails and campgrounds are located outside the study area but are accessible via US 191 are also listed in **Table 4.2**.

**Table 4.2: Recreational Properties in the Study Area**

| Site Name | MP | Site Description | Owner |
|---|---|---|---|
| **Adjacent to US 191 – Within Study Area Buffer** | | | |
| **Kirk Wildlife Refuge/FAS** | 69.6 | Kirk Wildlife Refuge encompasses 17.4 acres and provides a FAS along the Gallatin River. The FAS is a day use site with hand launch boats only. Open all season. | MFWP |
| **Indian Ridge Trail** | 64.7 | Developed trail with parking lot located on the west side of US 191 | USFS |
| **Hell Roaring Creek Trail** | 63.6 | Developed trail with parking lot located on the west side of US 191 | USFS |
| **Lava Lake Trail** | 61.4 | Developed trail with parking lot located on the west side of US 191 | USFS |
| **Greek Creek Campground** | 58.2 | Campground with 16 sites including 7 handicapped accessible sites. This campground has a handicapped accessible toilet, picnic tables, drinking water, and trash pick-up service. Season extends from mid-May through mid-September. | USFS |
| **Moose Creek Flat Campground and Picnic Area** | 56.1 | This campground contains 13 sites and a day-use picnic area. A group day use picnic area accommodating up to 50 people is also available. Vault toilets, drinking water and trash collection are provided. The campground is open between mid-May and mid-September, | USFS |
| **Moose Creek Group Site** | 56.2 | This site, located east of US 191, is available for group picnicking or camping. Picnic tables and vault toilets are provided. Drinking water and trash collection are not available at the campground. | USFS |
| **Karst Trail** | 55.3 | Developed trail located on the west side of US 191 | USFS |
| **Deer Creek Trail** | 51.5 | Developed trail located on the west side of US 191 | USFS |
| **Gallatin Wildlife Management Area** | 47.4 | WMA consisting of scattered parcels totaling approximately 8,600 acres. A portion of the WMA is located east of US 191 generally between Frenchman Road and Beaver Creek Road. Trailhead access is available from Porcupine Creek Road. | MFWP |
| **Ophir School/ Lone Peak High School** | 45.4 | The Ophir School site consists of an elementary and middle school serving grades K-8. Lone Peak High School is located north of Ophir School. Outdoor recreational facilities exist at the school but are located away from the US 191 corridor. | Big Sky School District #72 |
| **Porcupine Creek Trail** | 45.3 | Developed trail located on the east side of US 191 | USFS |
| **Accessed Via US 191 – Outside Study Area Buffer** | | | |
| **Axtell Bridge FAS** | 78.5 | FAS encompassing 4.2 acres along the Gallatin River. The FAS is a day use site with hand launch boats only. Open year-round. | MFWP |
| **Spire Rock Campground** | 63.9 | Campground with 19 sites. This campground has a handicapped accessible toilet and trash pick-up service. Season extends from mid-May through mid-September. | USFS |
| **Storm Castle Road Trailhead** | 63.5 | Trailhead accessed via Storm Castle Road for access to moderately developed trail Storm Castle Mountain, developed trail Garnet Mountain, and developed trail Gallatin Riverside. | USFS |
| **Swan Creek Campground** | 57.3 | Campground with 13 sites including 7 handicapped accessible sites. This campground has a handicapped accessible toilet, drinking water, and trash pick-up service. Season extends from mid-May through mid-September. | USFS |

## 4.3. Cultural and Historic Resources

Section 106 of the *National Historic Preservation Act* (36 CFR 800) establishes requirements for taking into account the effects of proposed Federal, Federally-assisted, or Federally-licensed undertakings on any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP). The implementing regulations of Section 106 require agencies to

seek ways of avoiding, minimizing, or mitigating any adverse effects on historic and archaeological properties. Additionally, Section 106 requires consultations with the Indian Tribes that may have current or traditional interests in the project area.

Other Federal and State of Montana directives impose additional requirements that must be addressed regarding effects of proposed undertakings on historic and archaeological resources and paleontological sites. Federal directives addressing historic and archaeological resource issues include Section 4(f) of the *US Department of Transportation Act*, the *Archaeological Resources Protection Act* and the *Native American Graves Protection and Repatriation Act*. State of Montana directives addressing historic and archaeological resource issues include the *Montana Antiquities Act* (which also addresses paleontological resources) and the *Montana Human Skeletal Remains and Burial Site Protection Act*. MDT consults with the Montana State Historic Preservation Office (SHPO) or the appropriate Tribal Historic Preservation Office (THPO) to ensure compliance with Section 106 and other directives regarding cultural resources.

The area encompassing the US 191 corridor contains a wide variety of cultural resources including historic buildings, farmsteads, irrigation systems, transportation features, historic mining sites, and archaeological sites. To support this corridor study, a file search of each section of land crossed by US 191 in the study area was conducted by the Montana SHPO in September 2019. The search identified 73 historic properties within the general vicinity of US 191. These sites include:

- 2 sites listed on the NRHP—Gallatin Gateway Inn (Site 24GA0746) and Little Bear School (Site 24GA0791);
- 18 sites determined eligible for the NRHP; and
- 53 sites with undetermined NRHP eligibility status.

**Table 4.3** lists the site numbers, locations, site types, ownership, and NRHP eligibility determinations for the 18 previously recorded cultural sites in the Townships searched for the US 191 corridor study area. Note that only those sites listed or eligible for listing on the NRHP are shown in the table. A complete list of the recorded historic sites can be found in **Table B.7**.

**Table 4.3: Previously Recorded Historic Sites in the General Study Area**

| Site # | Township, Range, Section | Site Type | Ownership | NRHP Status |
|---|---|---|---|---|
| 24GA0335 | T2S R4E, Section 13 | Historic Residence & Outbuildings | Private | Eligible |
| 24GA0742 | T2S R4E, Sections 11, 14 | Historic Irrigation System | Private | Eligible |
| 24GA0915 | T2S R4E, Sections 11, 13, 14, 23, 26, 35 & T3S R4E, Sections 2, 11 | Historic Railroad | Private | Eligible |
| 24GA0982 | T2S R4E, Sections 11, 12, 13, 14 | Historic Irrigation System | Private | Eligible |
| 24GA0998 | T2S R4E, Sections 24, 35 & T3S R4E, Sections 2, 11 | Historic Irrigation System | Private | Eligible |
| 24GA1627 | T2S R4E, Sections 12, 13, 14, 23 | Historic Irrigation System | Private | Eligible |
| 24GA1676 | T2S R4E, Section 35 | Historic Vehicular/Foot Bridge | Other | Eligible |
| 24GA1781 | T2S R4E, Sections 11, 13, 14 | Historic Irrigation System | Private | Eligible |
| 24GA0746 | T3S R4E, Section 11 | Historic Hotel/Motel | Private | NR Listed |
| 24GA0791 | T3S R4E, Section 26 | Historic Education | Private | NR Listed |
| 24MA0257 | T3S R4E, Section 14, 27, 33, 34 | Historic Railroad, Stage Route, Travel | Combination | Eligible |

| Site # | Township, Range, Section | Site Type | Ownership | NRHP Status |
|---|---|---|---|---|
| 24GA0788 | T4S R4E, Section 28 | Historic Ranger Station | Forest Service | Eligible |
| 24GA0103 | T5S R4E, Section 25 | Lithic Material Concentration | Forest Service | Eligible |
| 24GA0317 | T5S R4E, Section 36 | Lithic Material Concentration | MDT/Other | Eligible |
| 24GA1783 | T5S R4E, Section 36 | Historic Mining | Forest Service | Eligible |
| 24GA1511 | T6S R4E, Section 27 | Historic Vehicular/Foot Bridge | MDT | Eligible |
| 24GA1549 | T6S R4E, Section 23 | Lithic Material Concentration | No Data | Eligible |
| 24GA1746 | T6S R4E, Section 12 | Lithic Material Concentration | Forest Service | Eligible |
| 24GA1747 | T6S R4E, Section 13 | Lithic Material Concentration | Forest Service | Eligible |
| 24GA0844 | T7S R4E, Section 16 | Historic Ranger Station | Forest Service | Eligible |

***Eligible:*** *SHPO and the agency agree that the site is eligible by consensus or a determination has been made by the Keeper of the National Register.* ***NR Listed:*** *Currently listed in the NRHP.*

About 30 of the sites either listed or determined potentially eligible are owned by the USFS. A future project on US 191 would likely not have an effect on NRHP properties located on USFS lands. Likewise, several other privately-owned sites containing historic buildings, historic homesteads/farmsteads are generally removed from the highway corridor and are anticipated to have no effect. Historic irrigation and transportation features, however, likely cross US 191 and may be impacted by future projects along the corridor. Given the ages and limited areas examined in previously completed cultural resource reports, additional previously unrecorded historic properties likely exist in the study area.

Data about Indian Tribes with potential interests in the study area was obtained from the Tribal Directory Assessment Tool (TDAT) available from the website of the US Department of Housing and Urban Development. TDAT has the ability to link tribes' geographic areas of current and ancestral interest down to the county level and provides tribal contact information to assist users with initiating Section 106 consultation under the *National Historic Preservation Act*. The TDAT search identified the following tribes with potential interests in Gallatin County:

- Apache Tribe of Oklahoma
- Crow Tribe of Montana
- Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
- Nez Perce Tribe
- Shoshone-Bannock Tribes of the Fort Hall Reservation

If any MDT initiated projects are forwarded from the planning study, a cultural resource survey for unrecorded historic and archaeological properties would be completed within the Area of Potential Effect defined for each project. Direct and indirect impacts (such as visual, noise, and access impacts) to NRHP listed or eligible properties may be considered if improvements options are carried forward. Flexibility in design would be ideal in avoiding and/or minimizing impacts to historically or culturally significant sites in the Study corridor.

## 4.4. Section 4(f) Resources

Projects that receive federal funding and/or discretionary approvals from the FHWA must demonstrate compliance with Section 4(f) of the *Department of Transportation Act* of 1966 (23 U.S.C. § 138 and 49 U.S.C. § 303). Section 4(f) protects publicly owned public parks, recreation areas, and wildlife/waterfowl refuges. Section 4(f) also protects historic sites of national, state, or local significance on public or private land that are potentially eligible for listing or are listed on the NRHP. The regulations require coordination with the official(s) with jurisdiction when making determinations about the use of protected properties or resources.

If a project uses a Section 4(f) property and a finding of *de minimis* impact is not made, FHWA can approve the use of that property only if the agency finds that (1) there is no feasible and prudent avoidance alternative to the use of the Section 4(f) property, and (2) all possible planning to minimize harm to the Section 4(f) property has been incorporated into the alternative.

Recreation facilities qualify as Section 4(f) properties if they are publicly owned, open to the public during normal hours of operation, and serve recreation activities as a major purpose as stated in adopted planning documents. National Forest lands are generally not subject to Section 4(f) unless portions of the public multiple use property are specifically designated by statute or identified in an official management plan as being primarily for public park, recreation, or wildlife and waterfowl refuge purposes, and are determined to be significant for such purposes. Section 4(f) also applies to historic sites on National Forest lands that are on or eligible for the NRHP.

The recreational sites listed in **Table 4.2** may be affected by improvement options forwarded from the planning study. If improvement options are forwarded from the corridor study, potential effects on recreational use should be investigated and appropriately considered in accordance with Section 4(f).

## 4.5. Section 6(f) Resources

Projects may also be subject to Section 6(f) of the *Land and Water Conservation Fund (LWCF) Act* which was enacted to preserve, develop, and ensure the quality and quantity of outdoor recreation resources. Section 6(f) protection applies to public recreational sites purchased or improved with LWCF funds. Section 6(f)(3) of the Act prevents conversion of lands purchased or developed with LWCF funds to non-recreation uses, unless the Secretary of the Department of the Interior, through the National Park Service, approves the conversion. Conversion may only be approved if it is consistent with the comprehensive statewide outdoor recreation plan in force when the approval occurs, and the converted property is replaced with other recreation property of at least equal fair market value and of reasonably equivalent usefulness and location.

The list of all projects funded by LWCF grants within Gallatin County (Montana State Parks 2019), was reviewed to identify Section 6(f) encumbered lands in the study area. One project, named Gallatin Gateway Recreation Facilities, is the only project implemented in vicinity of the study area that qualifies for protection under Section 6(f). It is unclear if any of these facilities are within the study area boundary and whether they would be affected by potential improvements to US 191.

Correspondence from MFWP in December 2003 included in the Gallatin Canyon Slope Flattening/Widening EA indicates LWCF funds were not used to acquire lands in the Kirk Wildlife Refuge or the Gallatin WMA. However, the Gallatin WMA was acquired with federal funding through the *Pittman Robertson Wildlife Restoration Act*. This Act requires replacement land mitigation for the use of federally encumbered lands similar to Section 6(f).

## 4.6. Visual Resources

The visual resources of an area include the features of its landforms, vegetation, water surfaces, and cultural modifications (physical changes caused by human activities) that give the landscape its visual character and aesthetic qualities. Landscape features, natural appearing or otherwise, form the overall impression of an area. Visual resources are typically assessed based on landscape character (what is seen), visual sensitivity (human preferences and values regarding what is seen), scenic integrity (degree of intactness and wholeness in landscape character), and landscape visibility (relative distance of seen areas) of a geographically defined view shed.

The study area encompasses a wide variety of settings including the US 191 roadway corridor and county roads, highway commercial developments, scattered rural residences, forested lands, mountainous terrain, riparian areas, and wetlands. Actions that may have visual impacts include projects on new locations or that involve expansion, realignment or other changes that could alter the character of an existing landscape or move the roadway closer to residential areas, parks and recreation areas, historic or other culturally important resources.

# 5.0. CONCLUSION

This *Environmental Scan* identifies physical, biological, social, and cultural resources within the study area that may be affected by potential future improvements arising from the *US 191 Corridor Study*. Project-level environmental analysis would be required for any improvements forwarded from this study. Information contained in this report may be used to support future environmental documentation for compliance with NEPA/MEPA.

# REFERENCES

[1] Ross, C. P., Andres, D. A., and Witkind, I. J., Geologic map of Montana: U.S. Geological Survey, plate 2, Scale 1:500,000, 1955.

[2] Blue Water Task Force, Inc. Upper Gallatin River Watershed Restoration Plan, May 2012.

[3] Montana Bureau of Mines and Geology, Preliminary Geologic Map of the Bozeman 30'x60' Quadrangle, 2002, http://www.mbmg.mtech.edu/pdf_100k/bozeman.pdf

[4] Montana Bureau of Mines and Geology, Geologic Map of the Ennis 30'x60' Quadrangle, 2006, http://www.mbmg.mtech.edu/pdf_100k/ennis.pdf

[5] United States Geological Survey, Siesmic Hazard Map for the State of Montana, 2013, http://ftp.geoinfo.msl.mt.gov/Documents/Maps/Individual/20130206_80_SeismicHazardMap.pdf

[6] Montana Department of Environmental Quality, Final 2018 Water Quality Integrated Report, November 27, 2018.

[7] Montana Department of Transportation, Permanent Erosion and Sediment Control Design Guidelines, Revision 2, January 2018.

[8] Gallatin Watershed Sourcebook: A Residents Guide, Third Edition, 2017.

[9] Alan English, Gallatin Local Water Quality District, Overview of the Hydrogeology of the Gallatin Valley, August 16, 2007.

[10] Gallatin County, Gallatin County Floodplain Regulations, Gallatin County Ordinance No. 2017-011. Effective December 14, 2017. https://gallatincountymt.pt7.civic-cms.com/sites/gallatincountymt/files/uploads/gallatin_fp_regs_12.14.2017_0.pdf

[11] Cowardin, L.M., US Fish and Wildlife Service, Classification of Wetlands and Deepwater Habitats of The United States, December 1979.

[12] Montana Department of Environmental Quality, Karstolite Insulation and Other Asbestos, https://deq.mt.gov/Portals/112/Land/StateSuperfund/Documents/Asbestos/BrochureFinalKarstoliteAndAsbestos7-2008.pdf

[13] Gallatin County Weed District, Gallatin County Noxious Weed Management Plan 2018-2020, September 2018.

[14] Deborah A. Wambach, Montana Department of Transportation, Threatened and Endangered Species and Biological Resources Report, January 28, 2002.

[15] Steven Gehman, Wild Things Unlimited, Prepared for The Wilderness Society, Wildlife of the Gallatin Mountains, Southcentral Montana, December 2010, http://www.wildthingsultd.org/wp-content/uploads/2012/08/Gallatin-Range_fullreport_with_photos.pdf

[16] Montana Fish, Wildlife & Parks, FishMT Species Distribution, Accessed September 13, 2019, https://myfwp.mt.gov/fishMT/distribution/speciesdistribution

[17] United States Census Bureau, American Community Survey, 5-Year Estimates 2013-2017, Four Corners, Gallatin Gateway, Big Sky, Gallatin County, and Montana.

US 191 Corridor Study
*Four Corners to Beaver Creek*

# Appendix A:

*Figures*

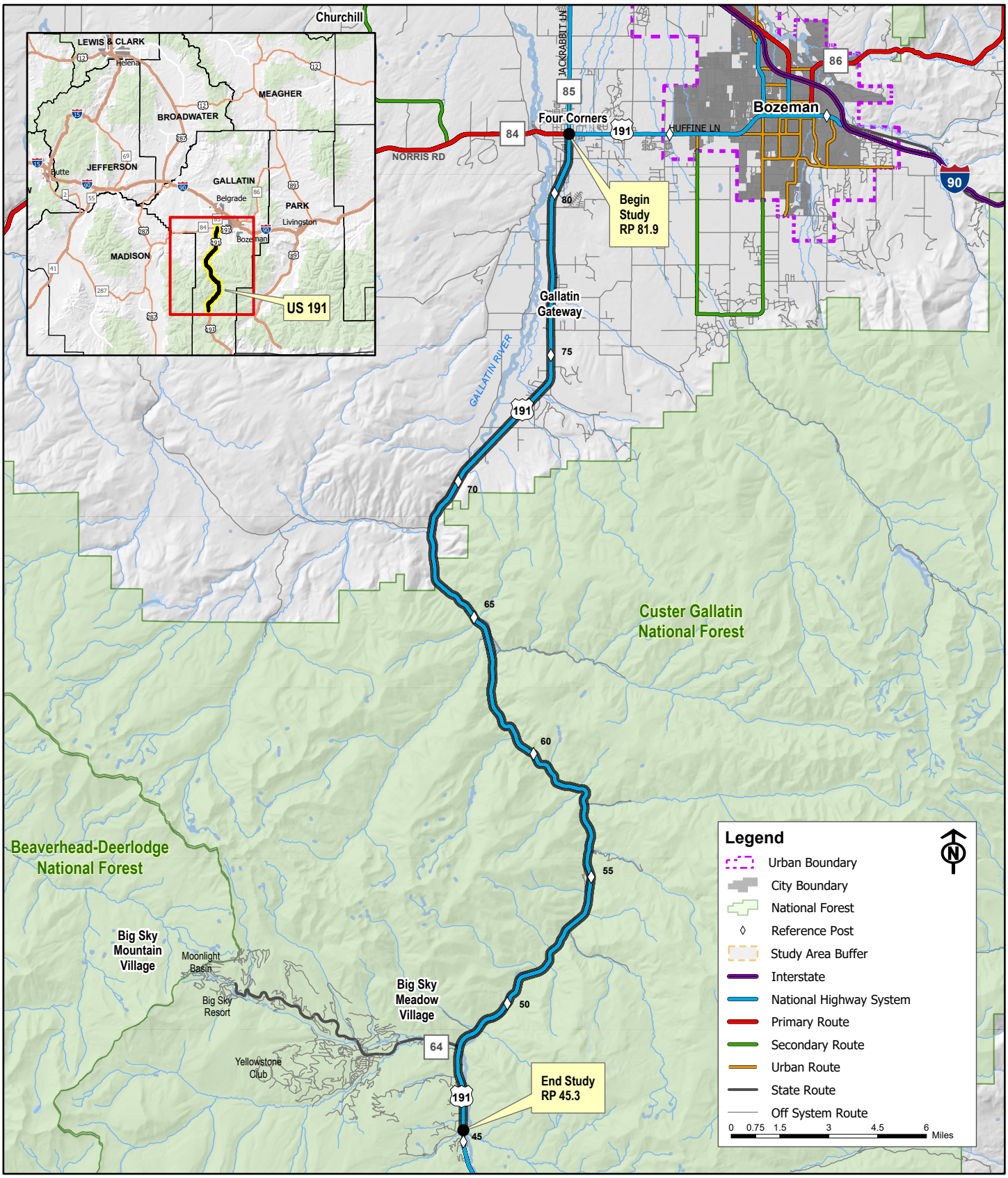
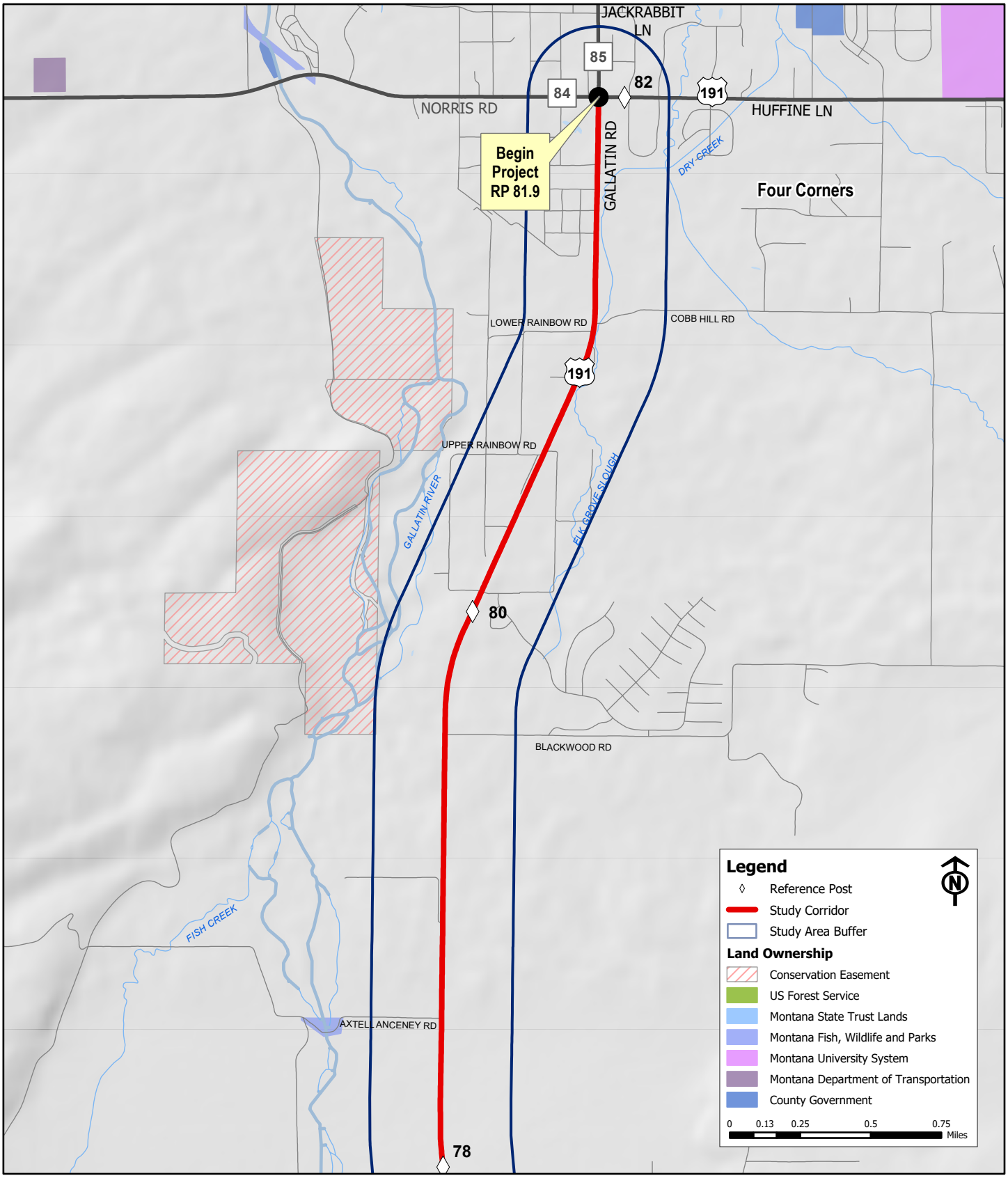



**Figure A.1: Study Area**


JACKRABBIT LN
85
84
82
191
NORRIS RD
HUFFINE LN
Begin Project RP 81.9
GALLATIN RD
DRY CREEK
Four Corners
LOWER RAINBOW RD
COBB HILL RD
191
UPPER RAINBOW RD
GALLATIN RIVER
ELK GROVE SLOUGH
80
BLACKWOOD RD
FISH CREEK
AXTELL ANCENEY RD
78
Legend
Reference Post
Study Corridor
Study Area Buffer
Land Ownership
Conservation Easement
US Forest Service
Montana State Trust Lands
Montana Fish, Wildlife and Parks
Montana University System
Montana Department of Transportation
County Government
0 0.13 0.25 0.5 0.75
Miles
N

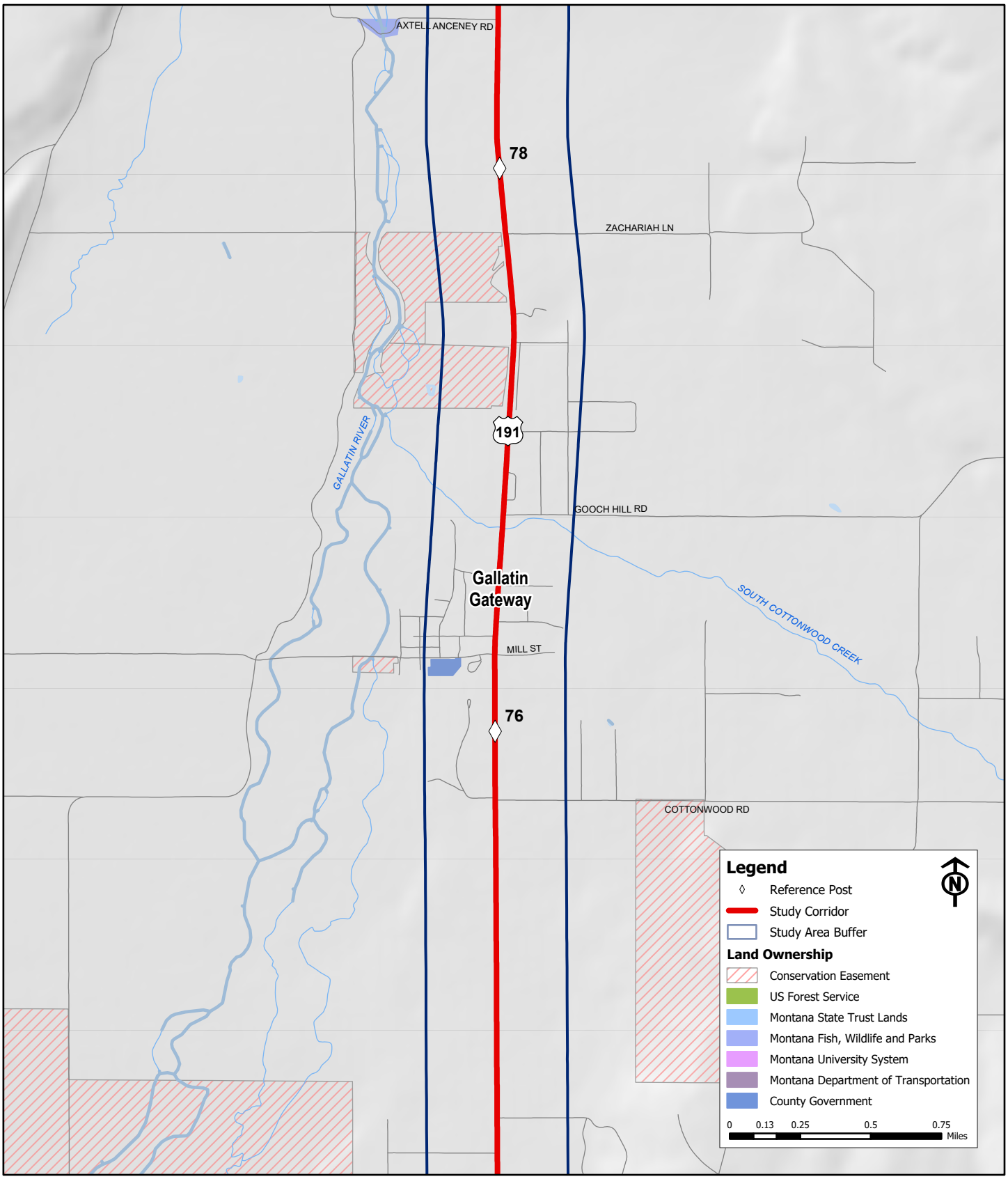
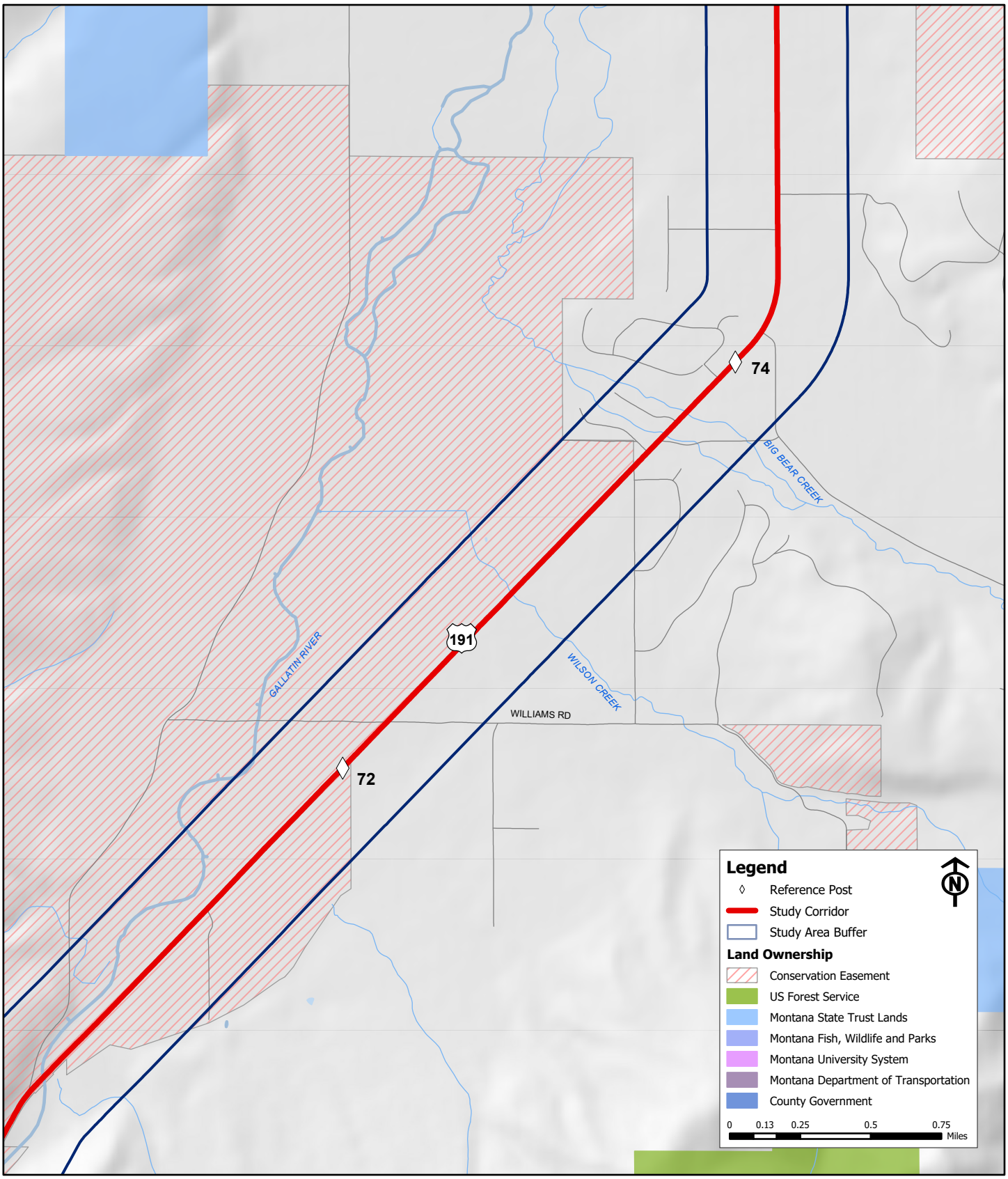



**Figure A.2: Land Ownership**


74
72
191
BIG BEAR CREEK
GALLATIN RIVER
WILSON CREEK
WILLIAMS RD
Legend
Reference Post
Study Corridor
Study Area Buffer
Land Ownership
Conservation Easement
US Forest Service
Montana State Trust Lands
Montana Fish, Wildlife and Parks
Montana University System
Montana Department of Transportation
County Government
0 0.13 0.25 0.5 0.75
Miles

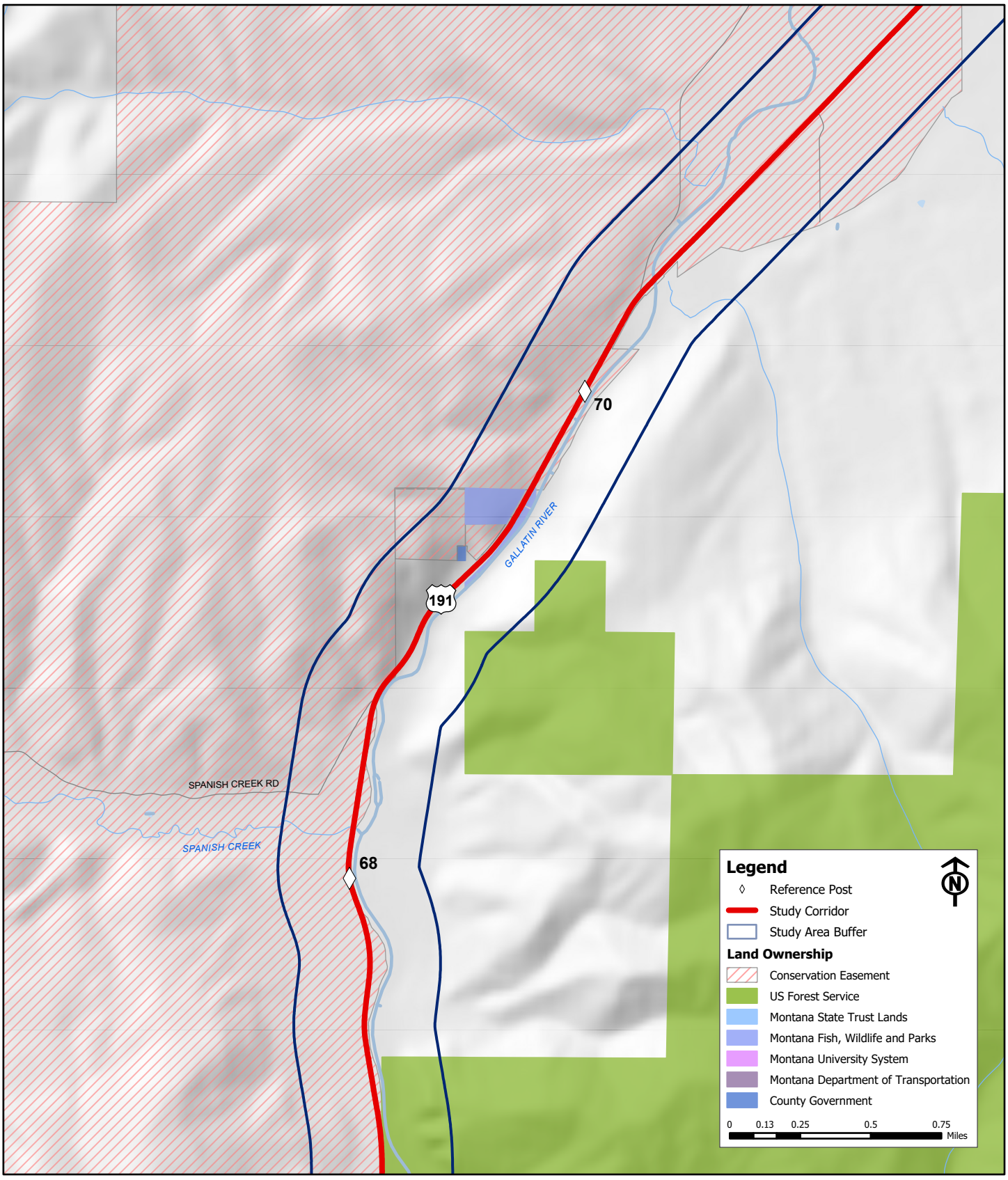





**Figure A.2: Land Ownership**

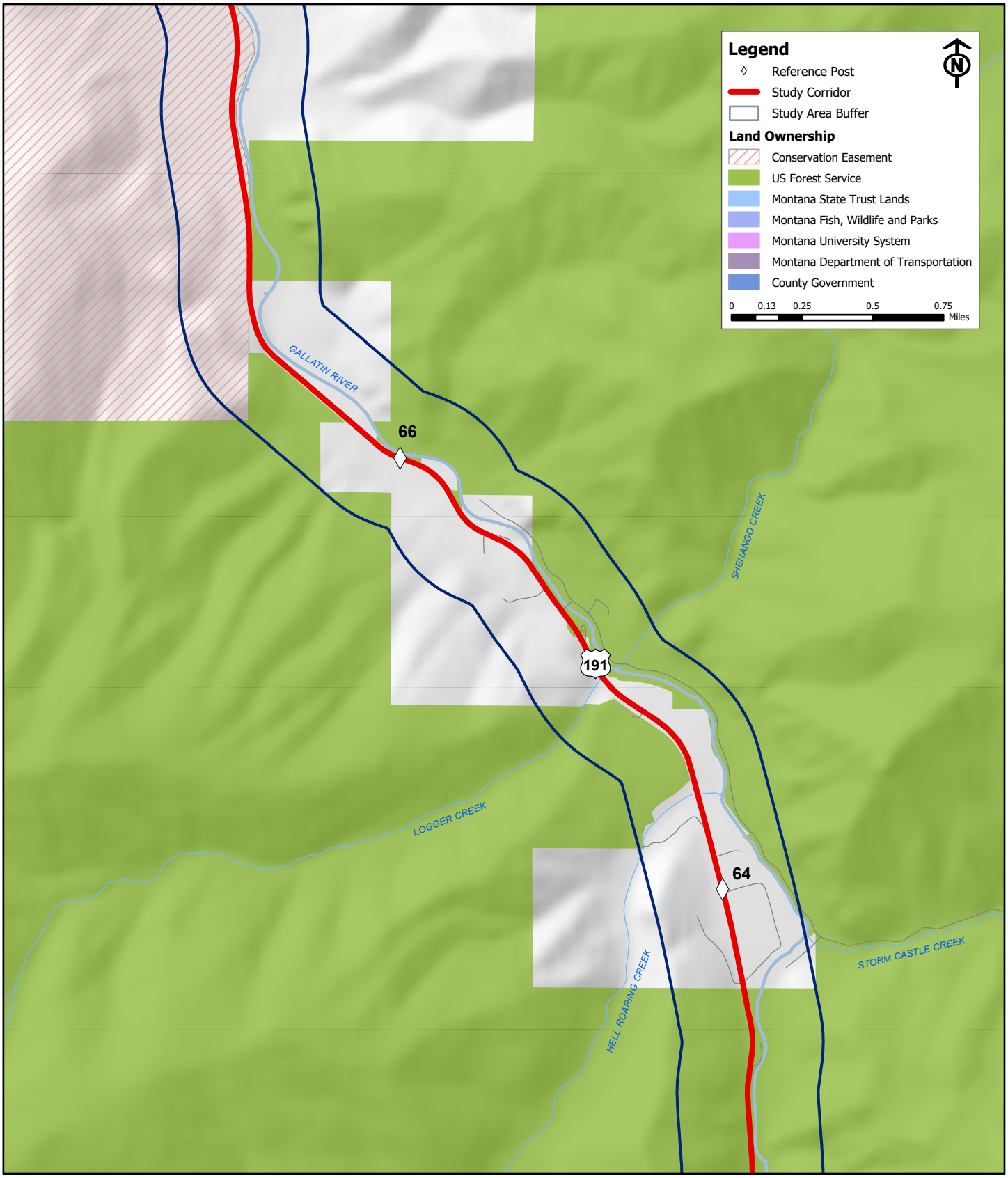



**Figure A.2: Land Ownership**

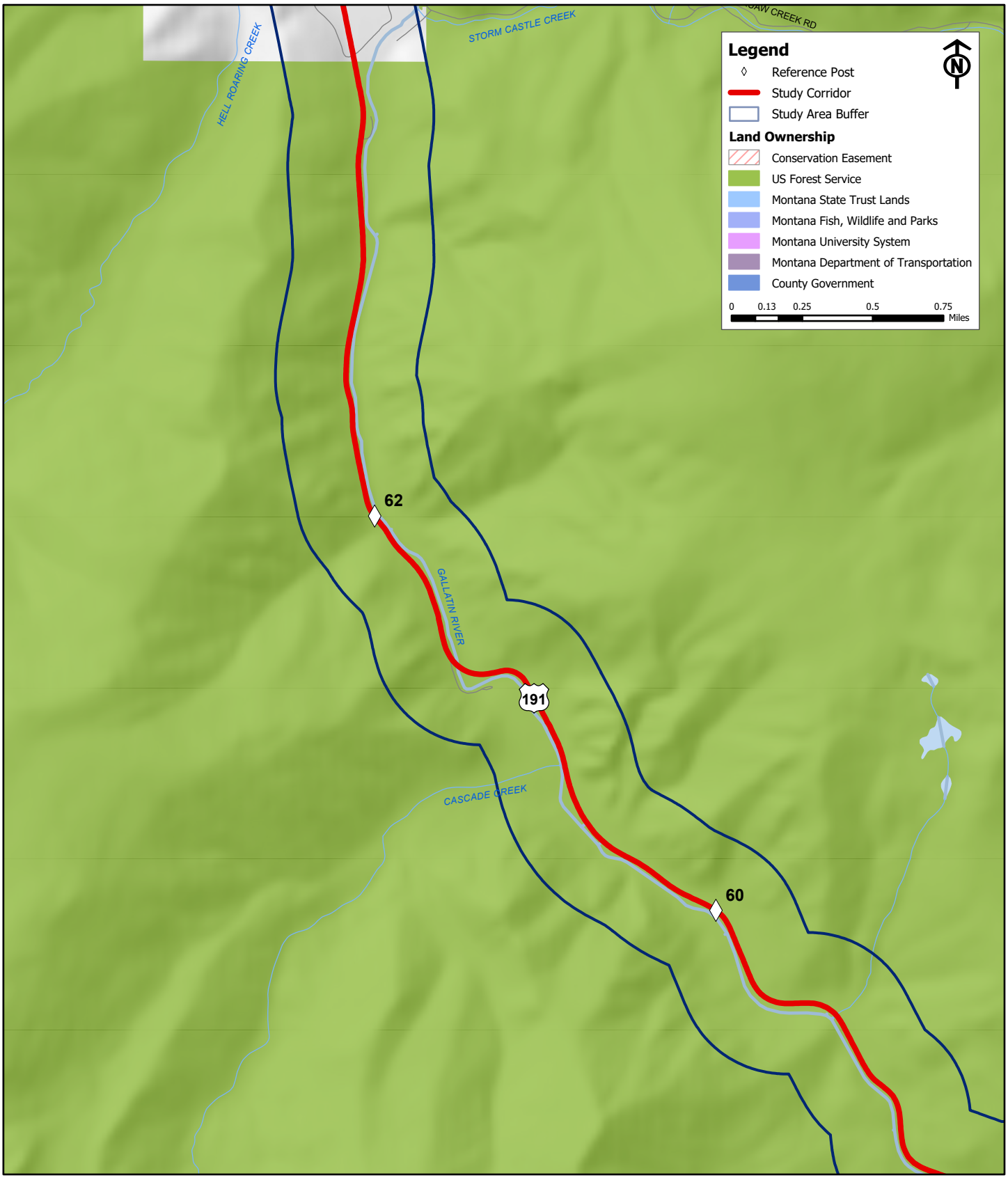



**Figure A.2: Land Ownership**

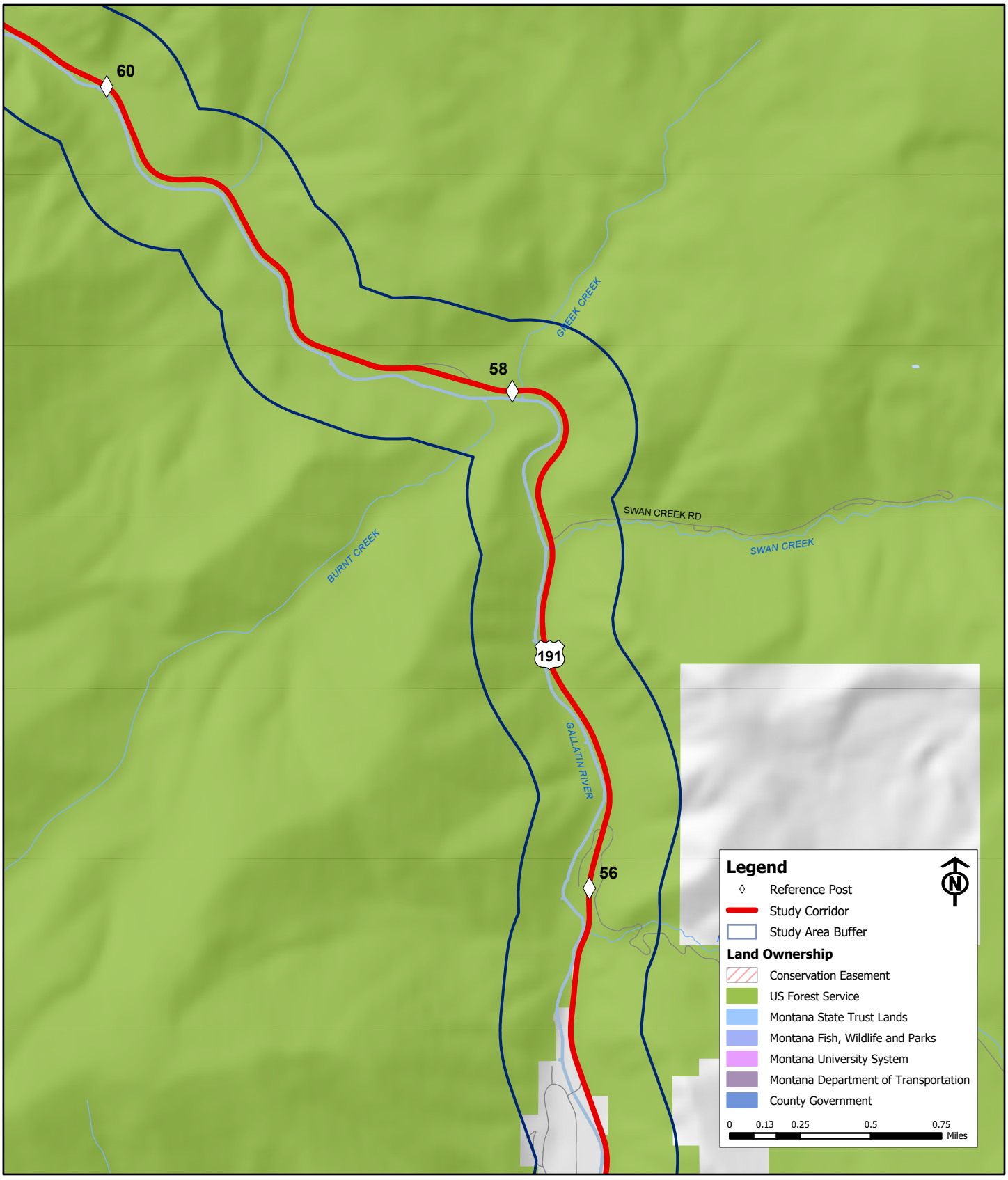





**Figure A.2: Land Ownership**

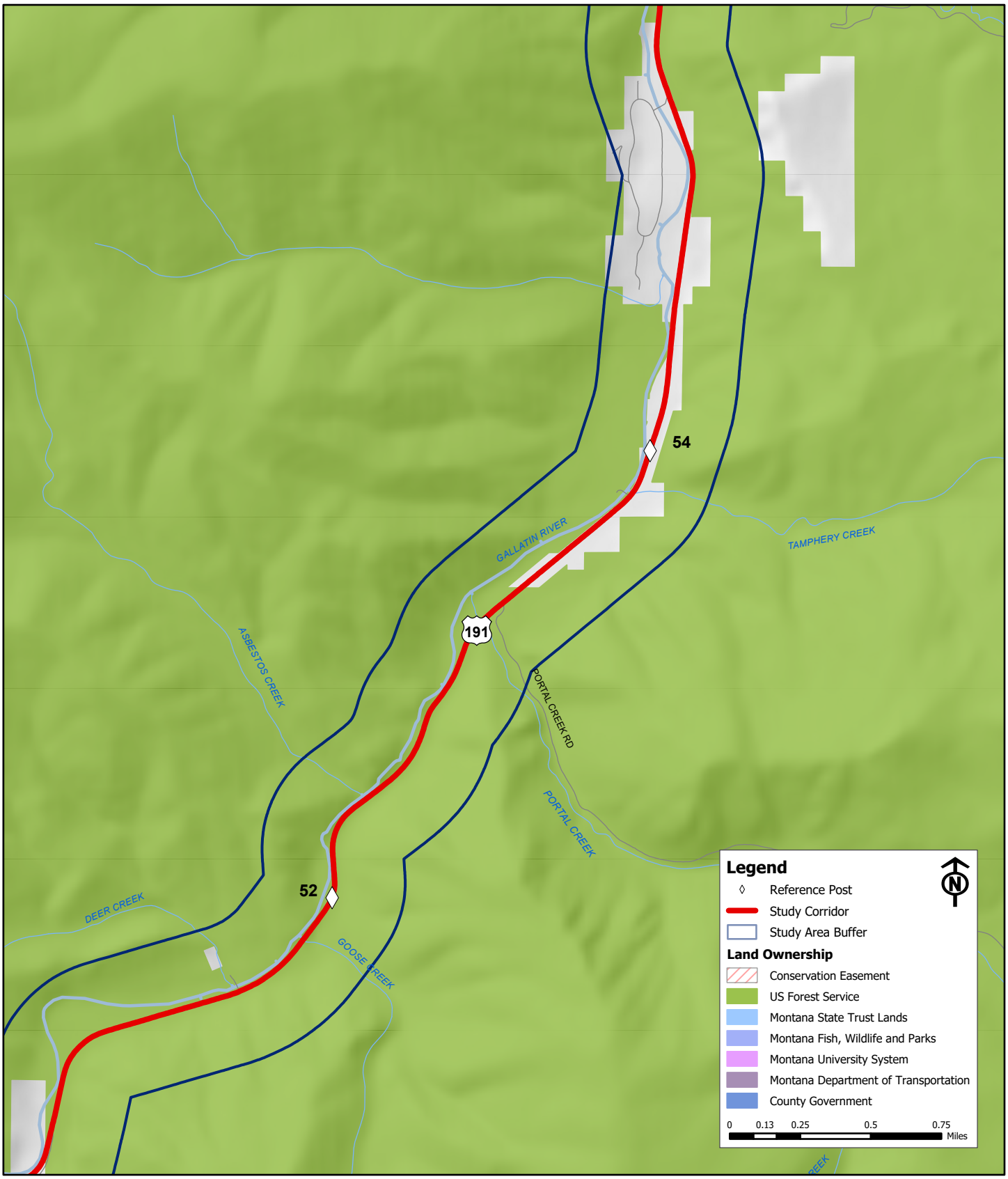
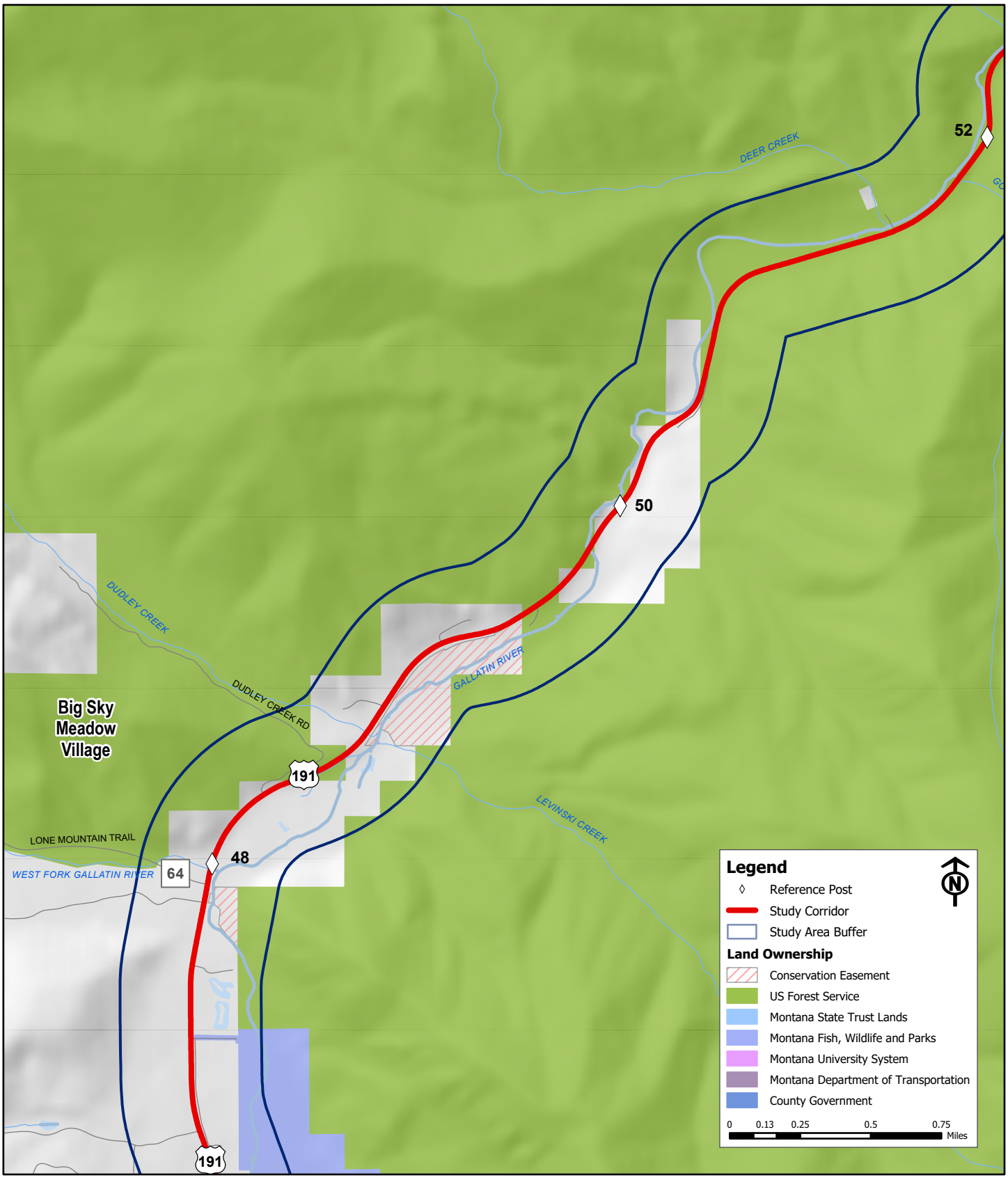





**Figure A.2: Land Ownership**


52
DEER CREEK
50
DUDLEY CREEK
DUDLEY CREEK RD
GALLATIN RIVER
Big Sky
Meadow
Village
191
LEVINSKI CREEK
LONE MOUNTAIN TRAIL
WEST FORK GALLATIN RIVER
64
48
191
Legend
Reference Post
Study Corridor
Study Area Buffer
Land Ownership
Conservation Easement
US Forest Service
Montana State Trust Lands
Montana Fish, Wildlife and Parks
Montana University System
Montana Department of Transportation
County Government
0 0.13 0.25 0.5 0.75
Miles

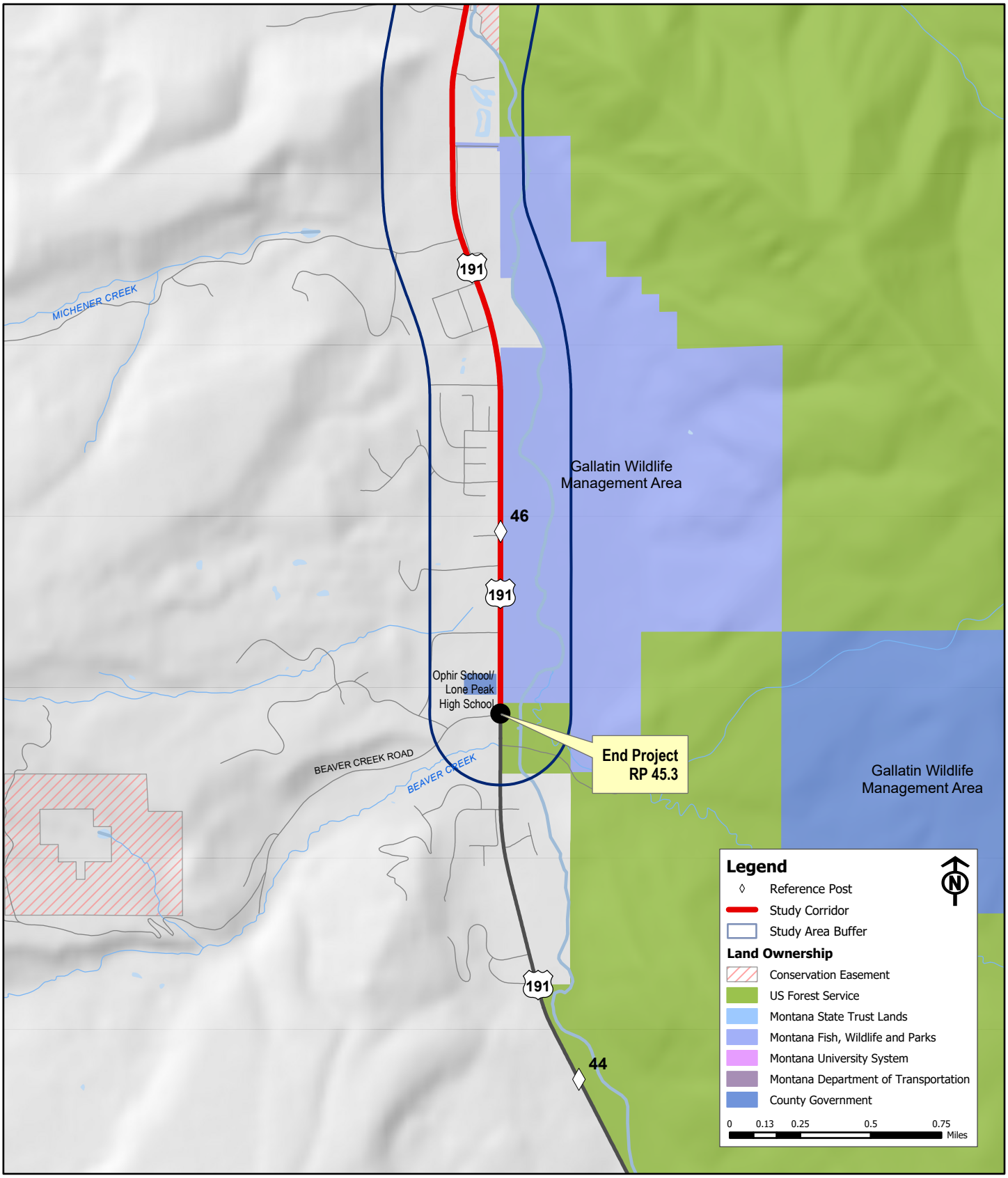





**Figure A.2: Land Ownership**

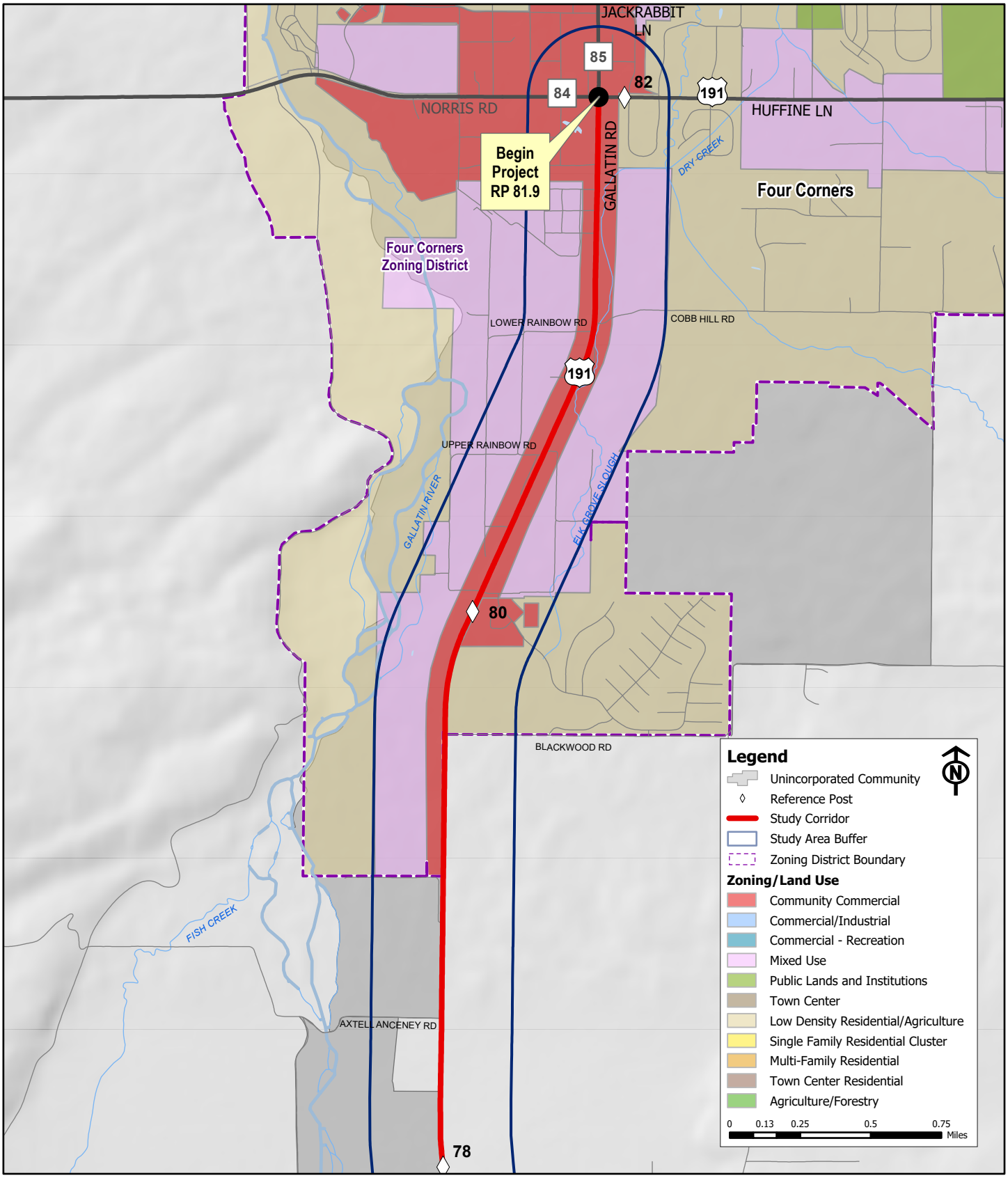





**Figure A.3: Designated Land Uses**

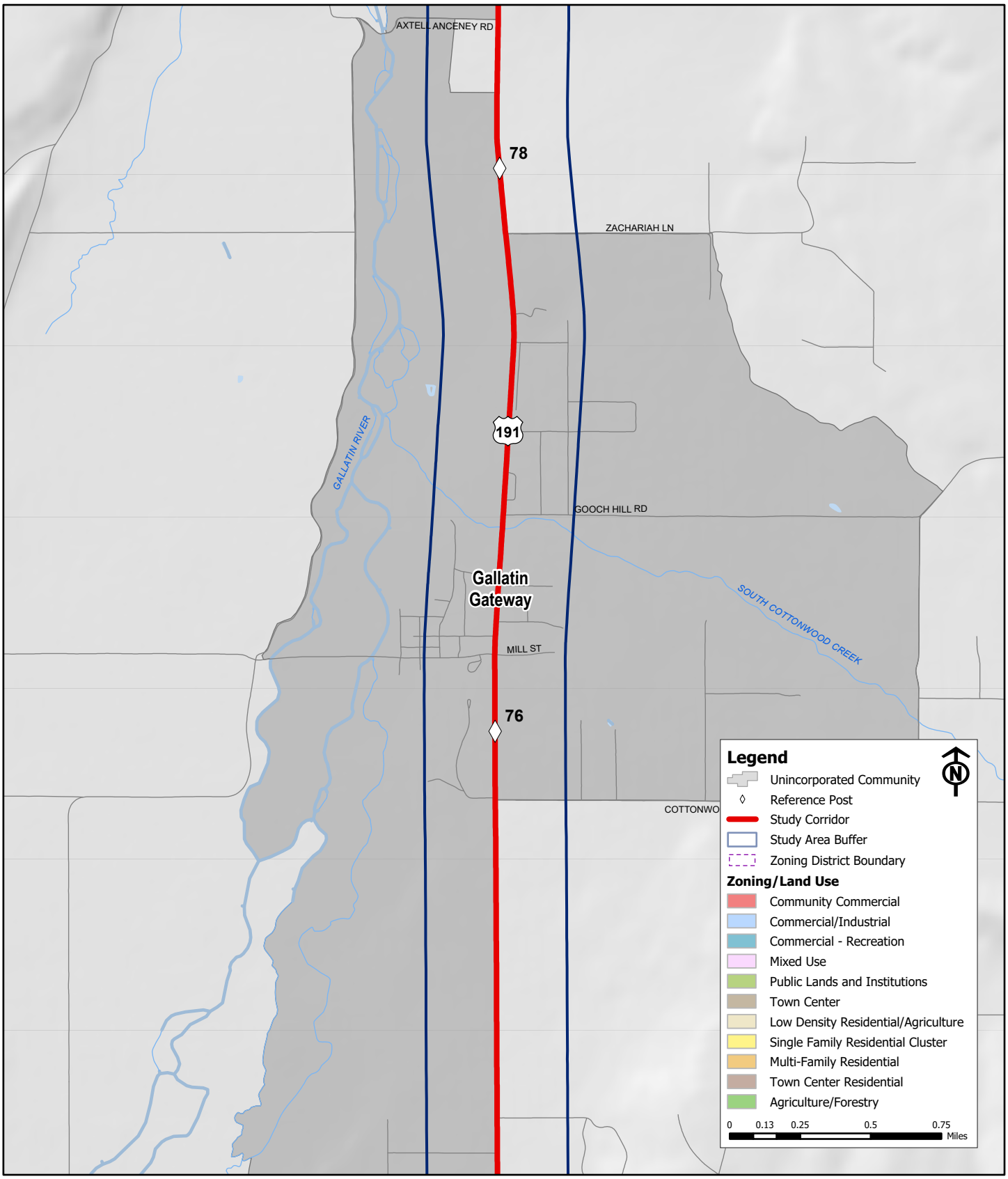





**Figure A.3: Designated Land Uses**

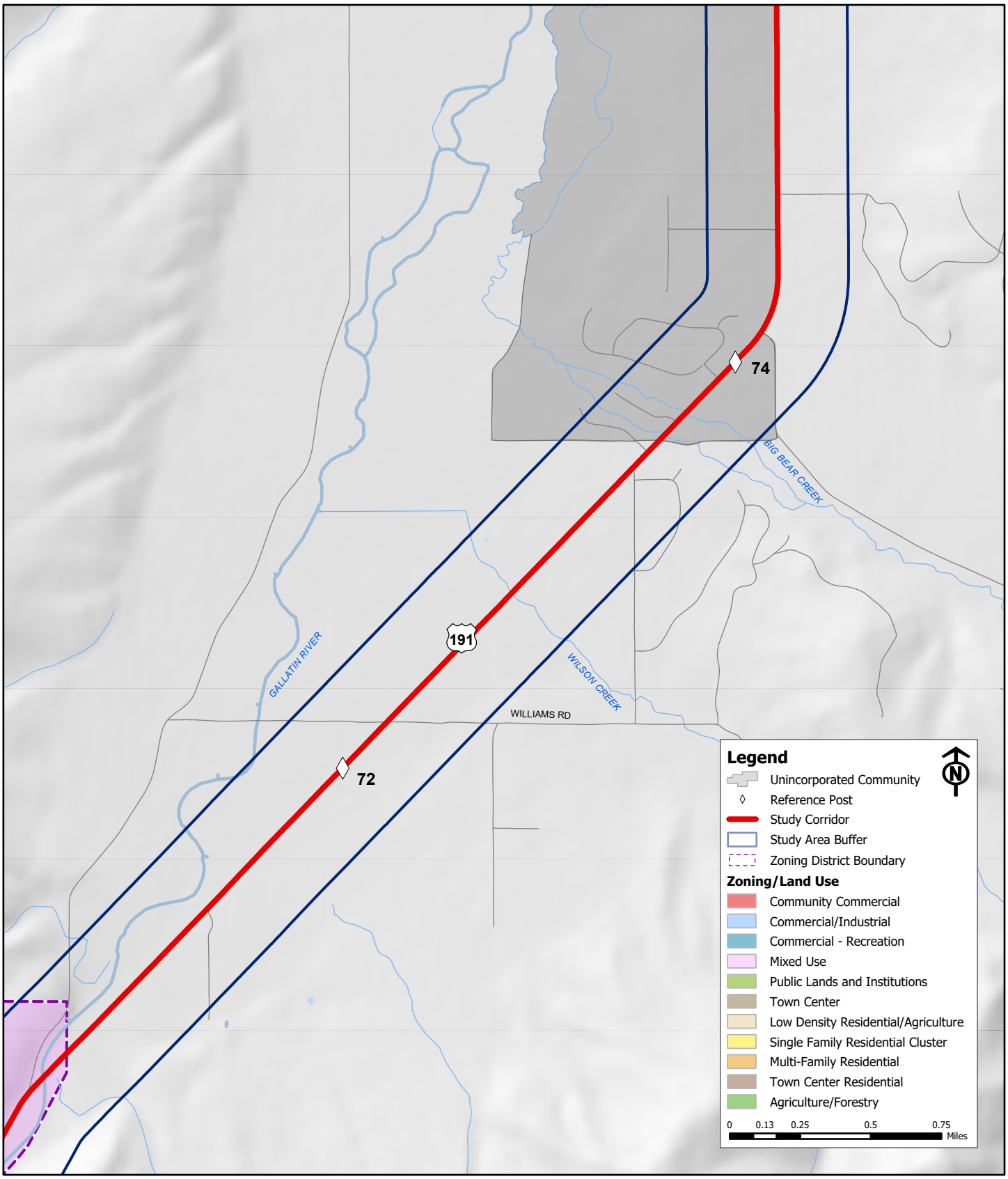





**Figure A.3: Designated Land Uses**

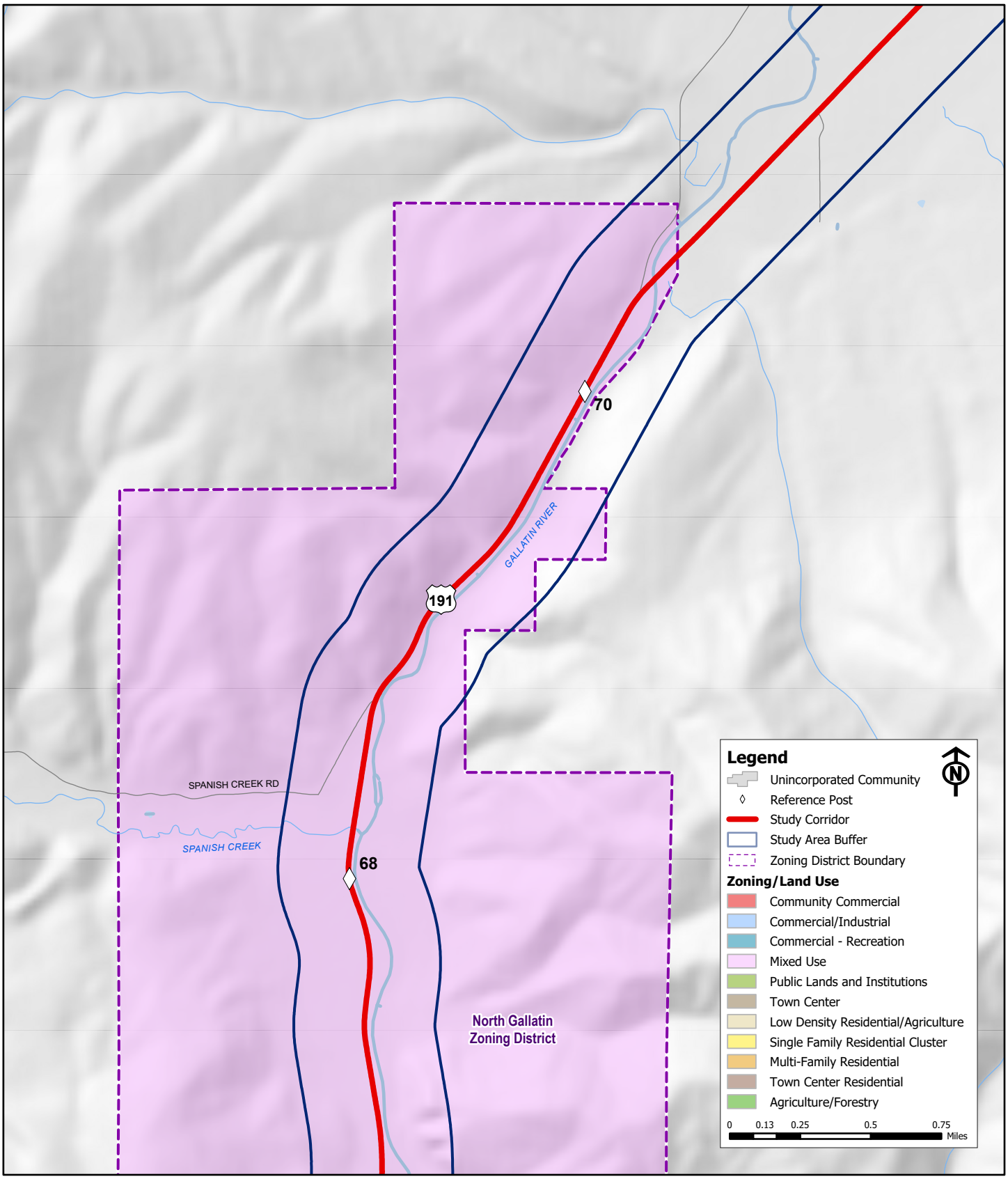





**Figure A.3: Designated Land Uses**

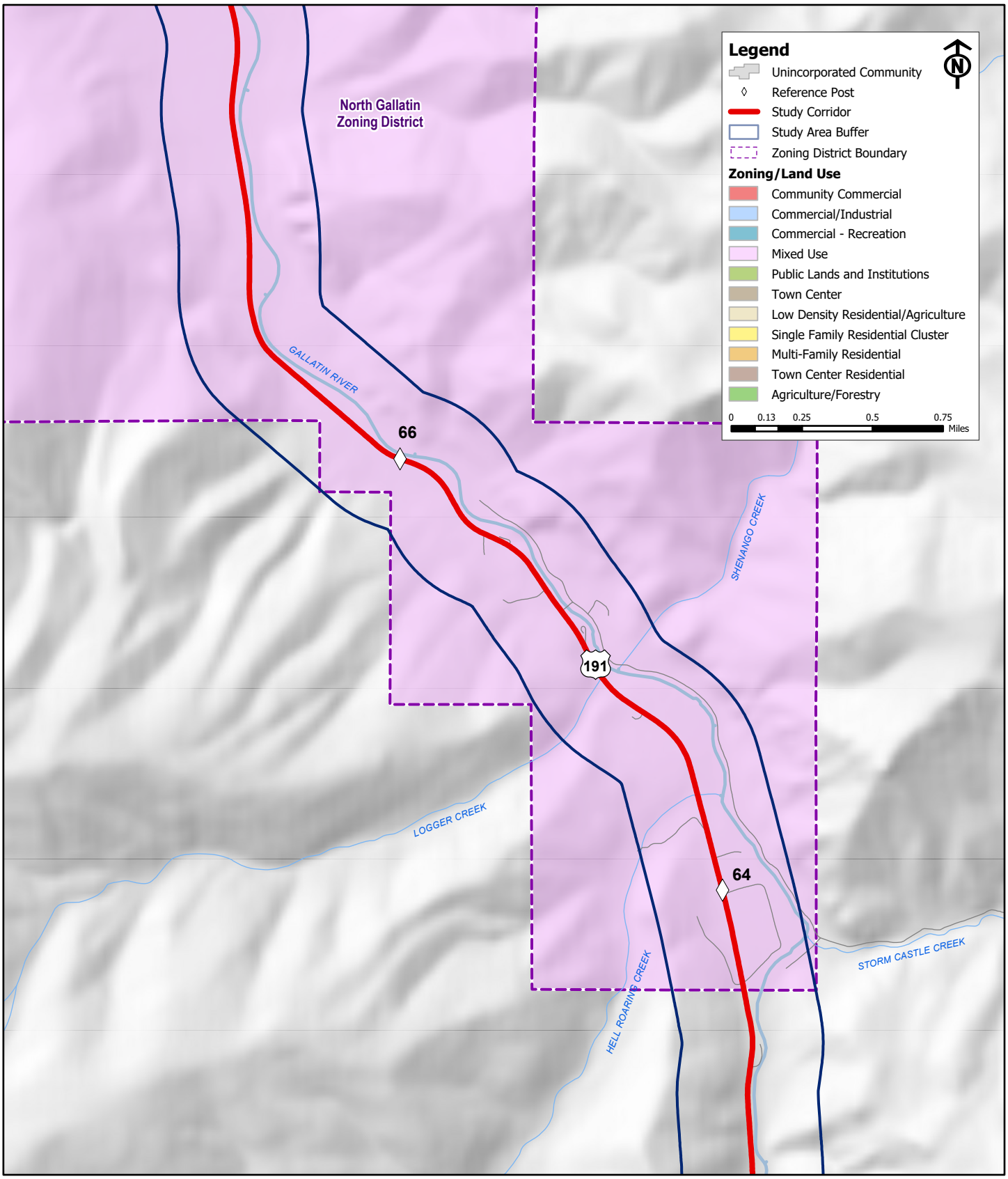





**Figure A.3: Designated Land Uses**

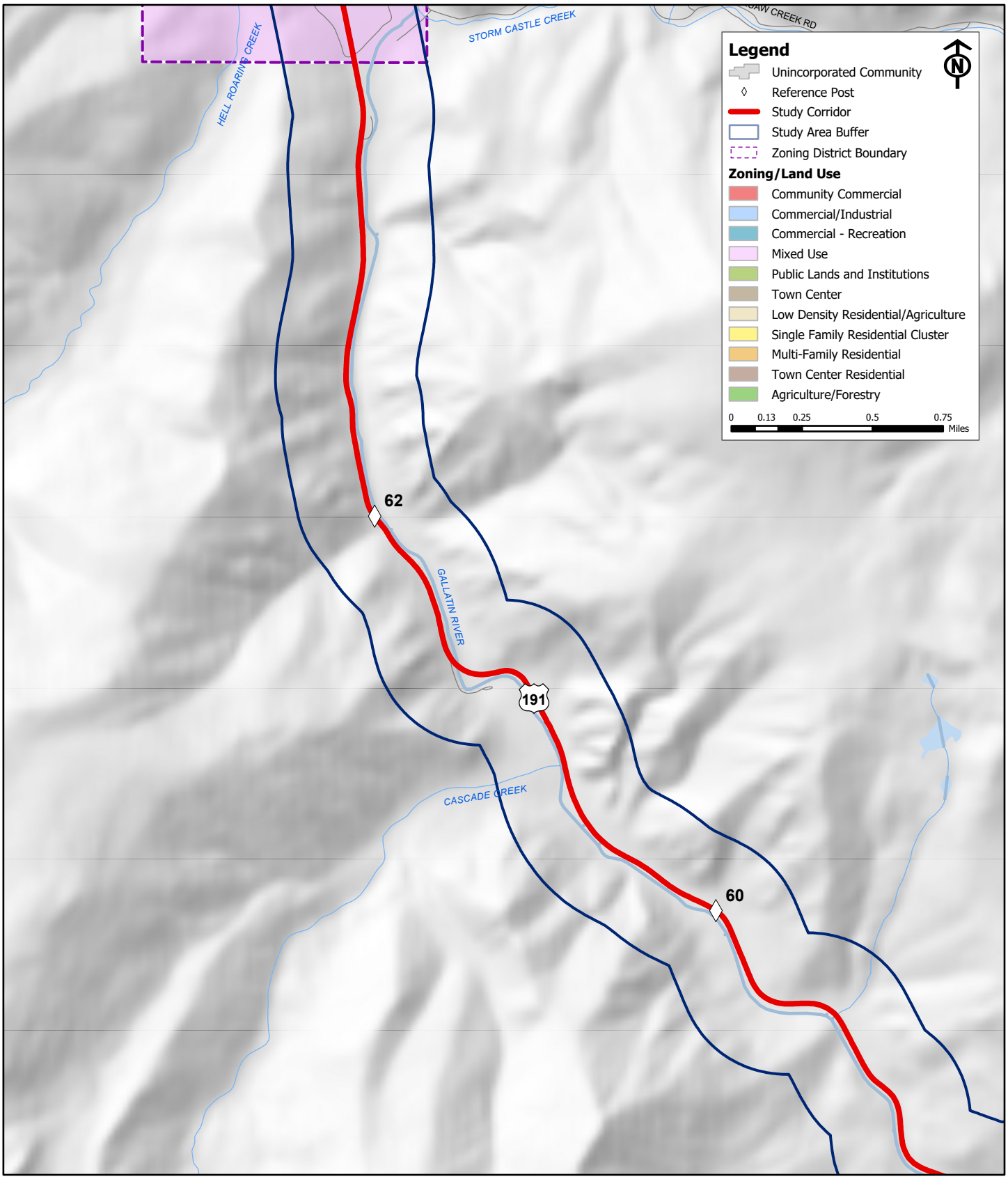





**Figure A.3: Designated Land Uses**

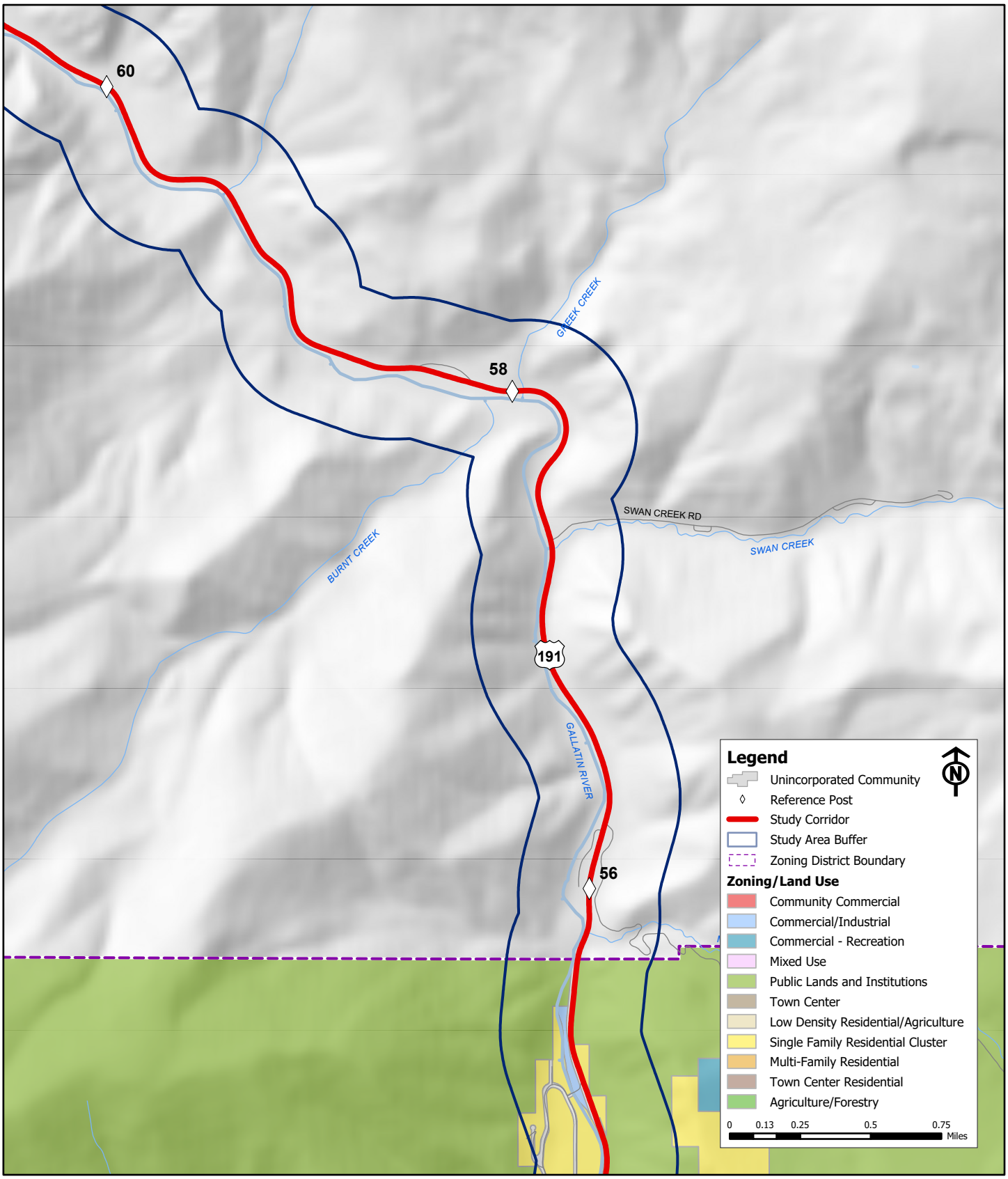



**Figure A.3: Designated Land Uses**

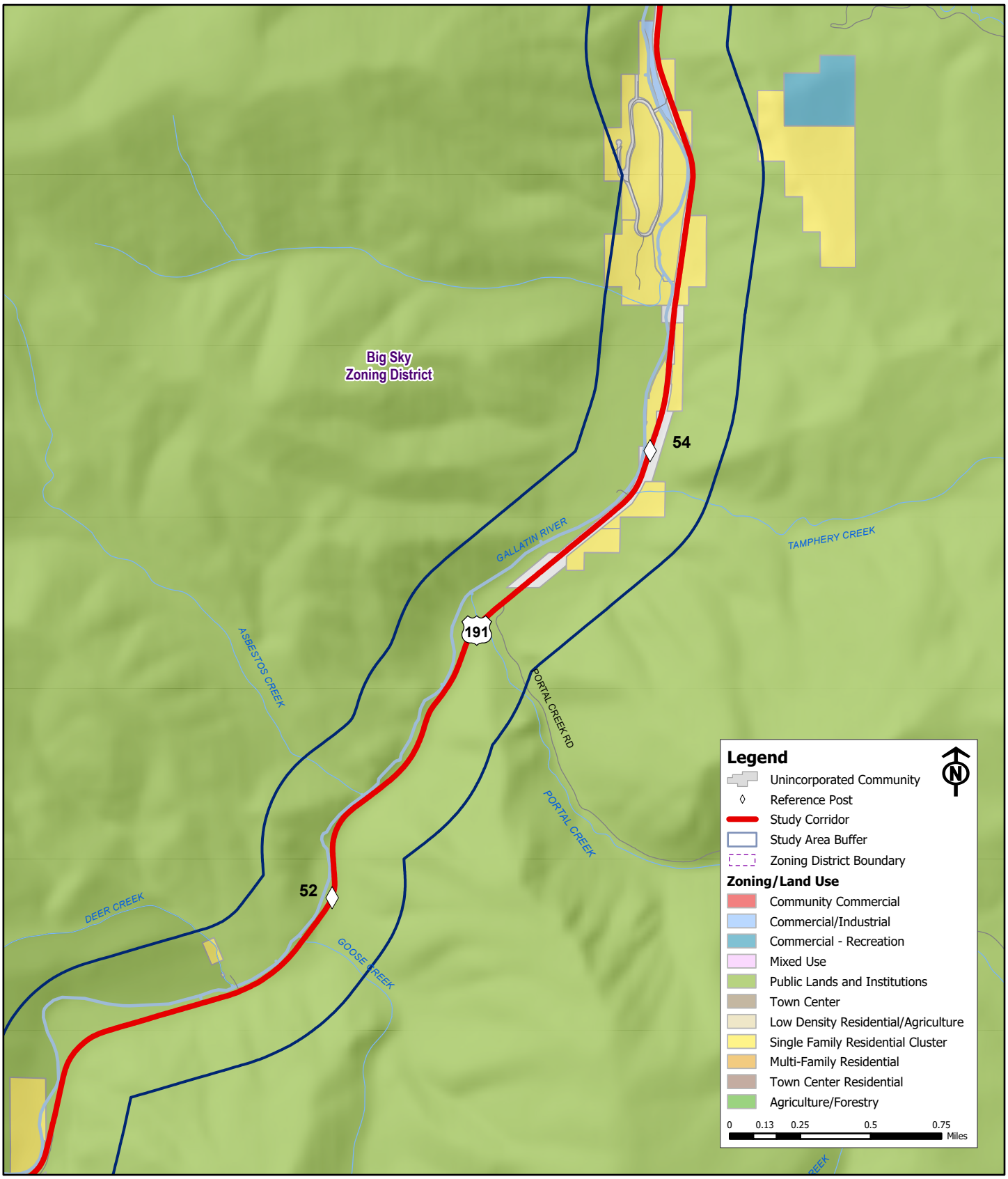





**Figure A.3: Designated Land Uses**

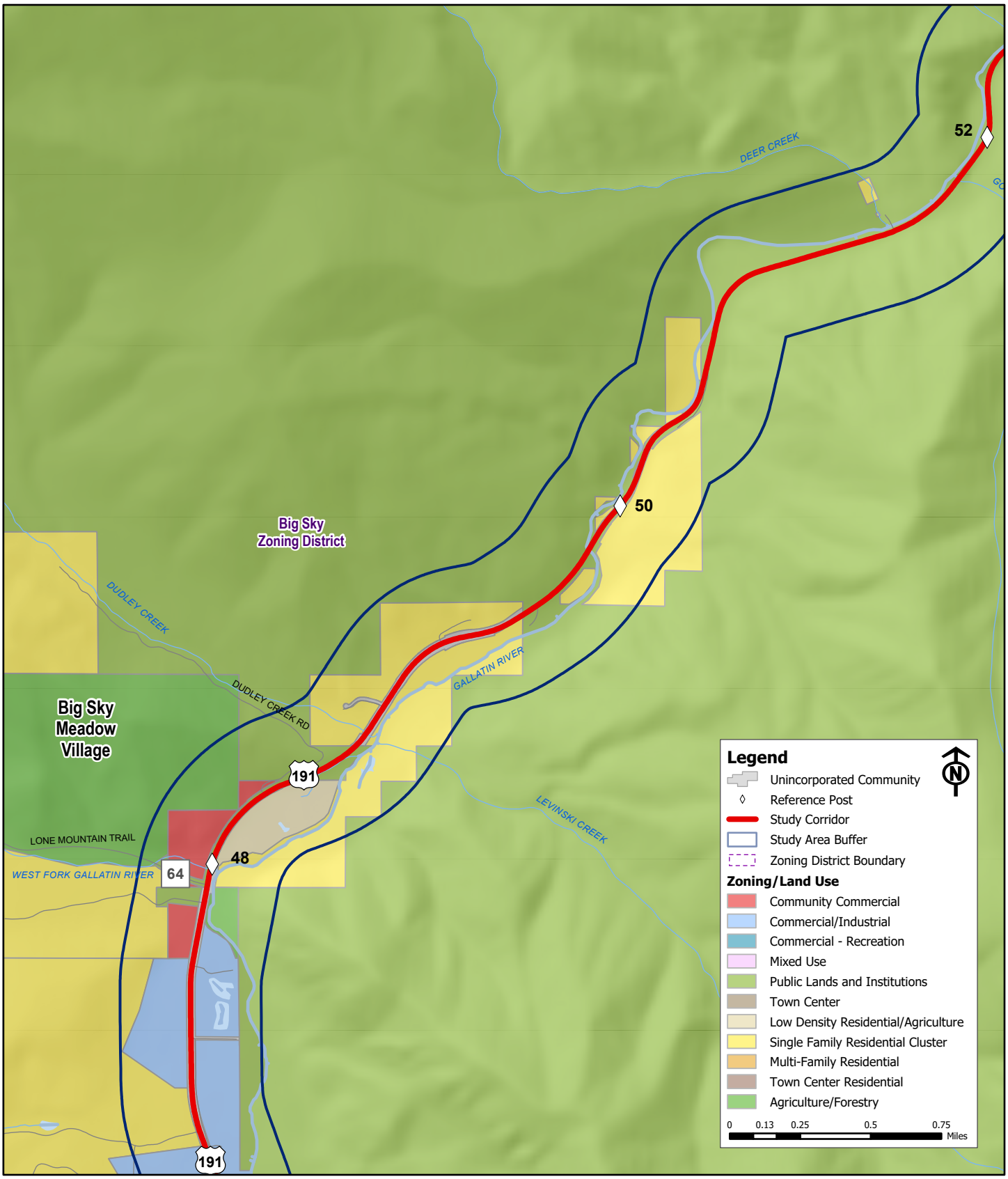





**Figure A.3: Designated Land Uses**

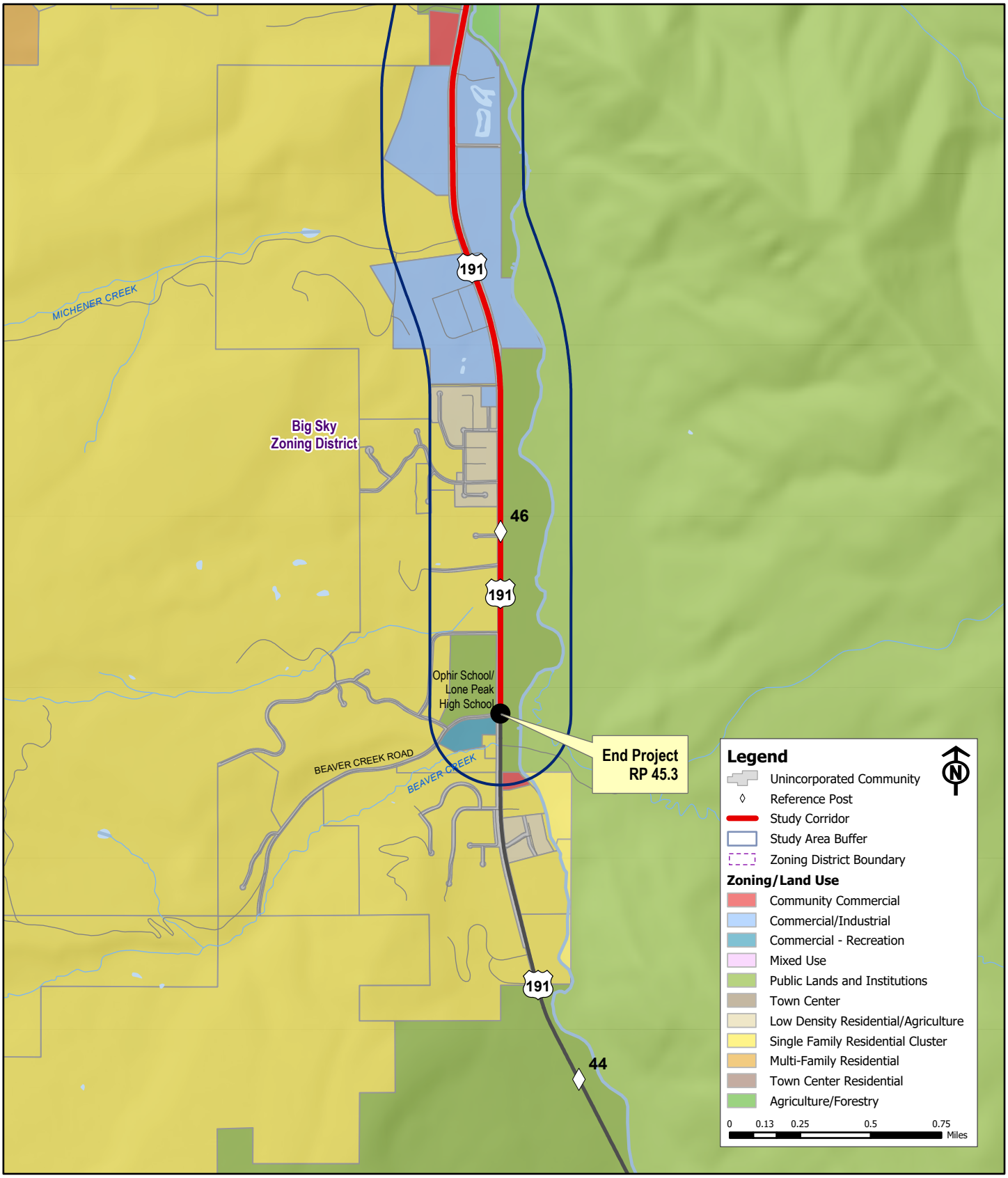





**Figure A.3: Designated Land Uses**

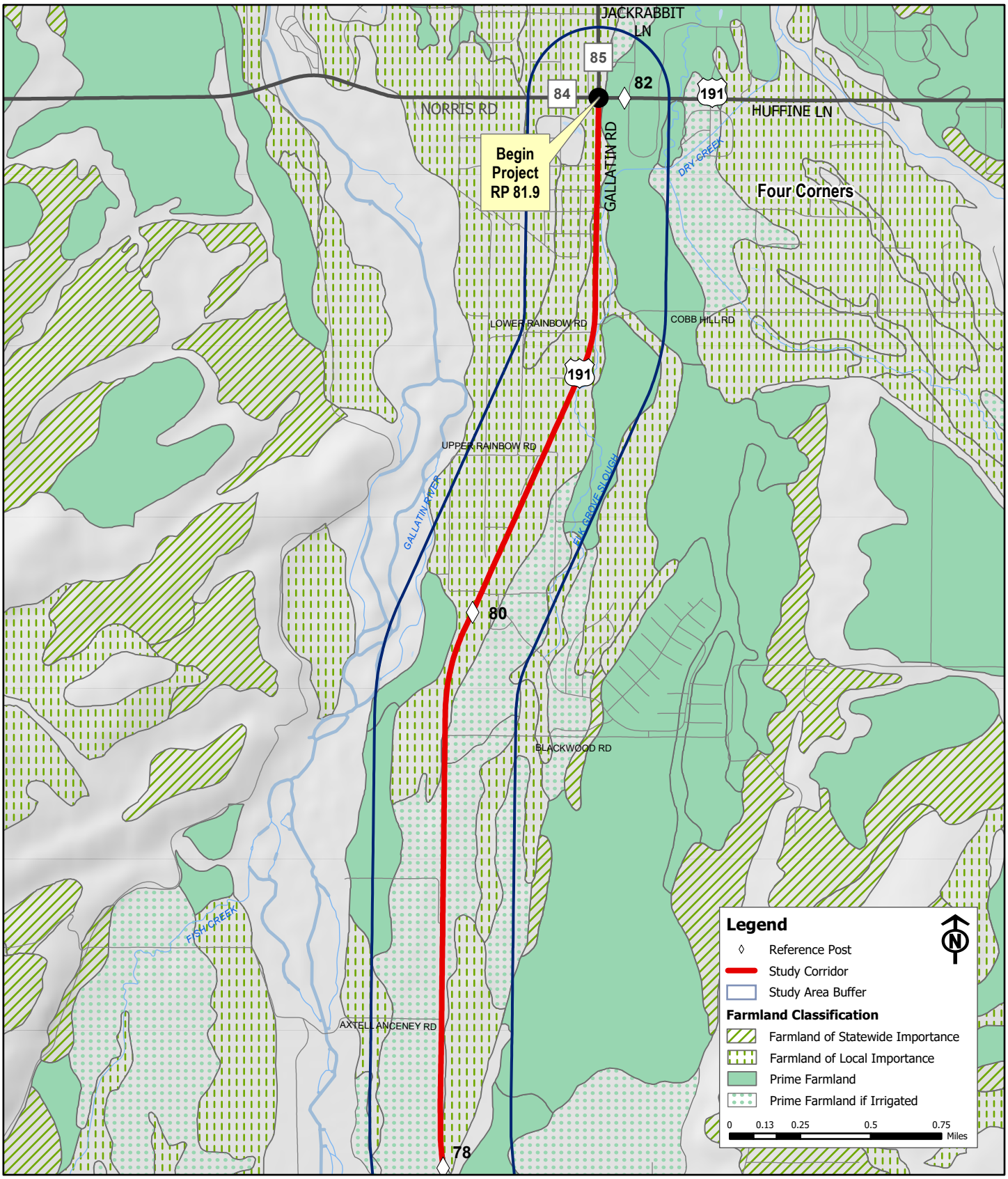





**Figure A.4: NRCS Farmland Classification**

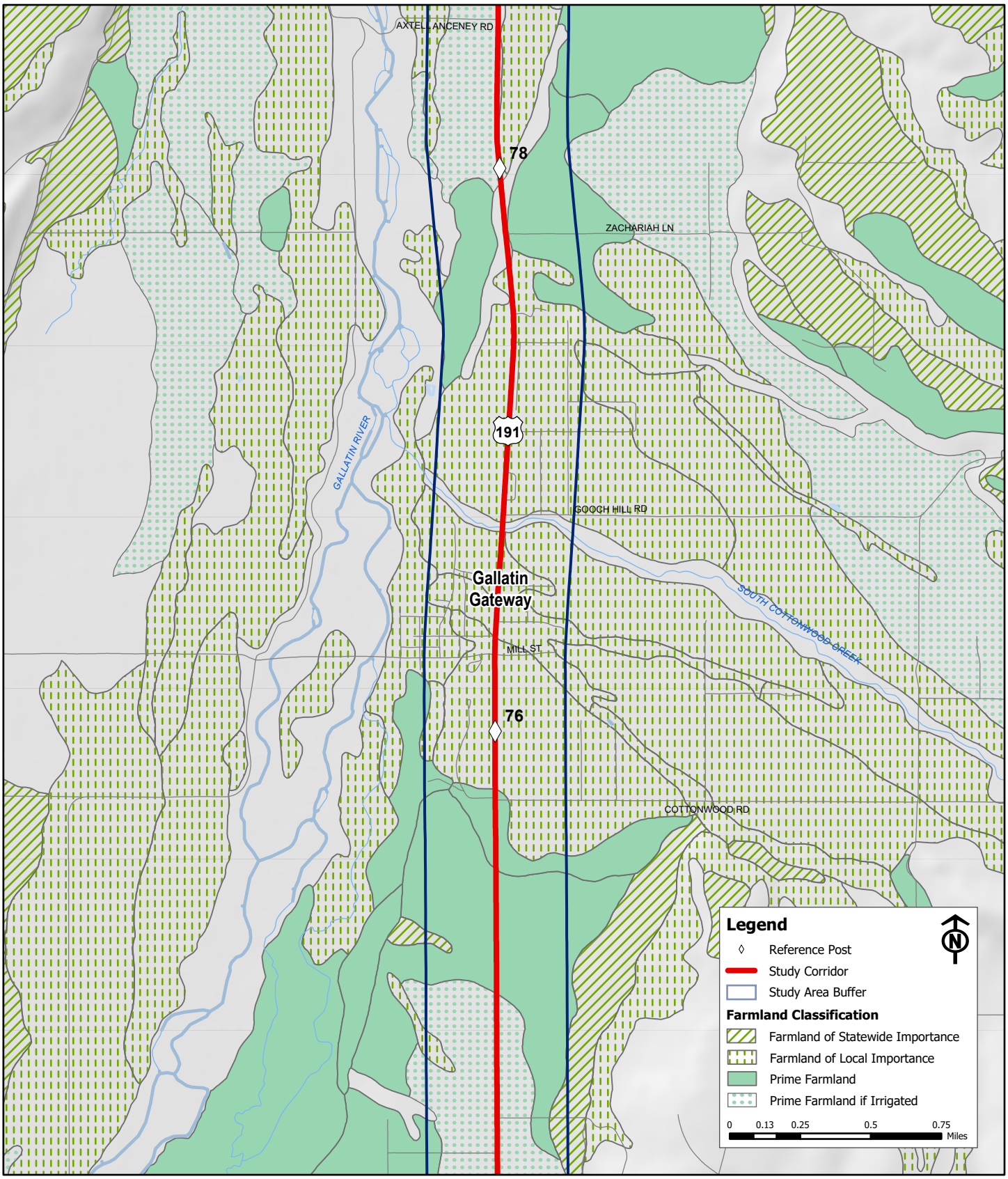



**Figure A.4: NRCS Farmland Classification**

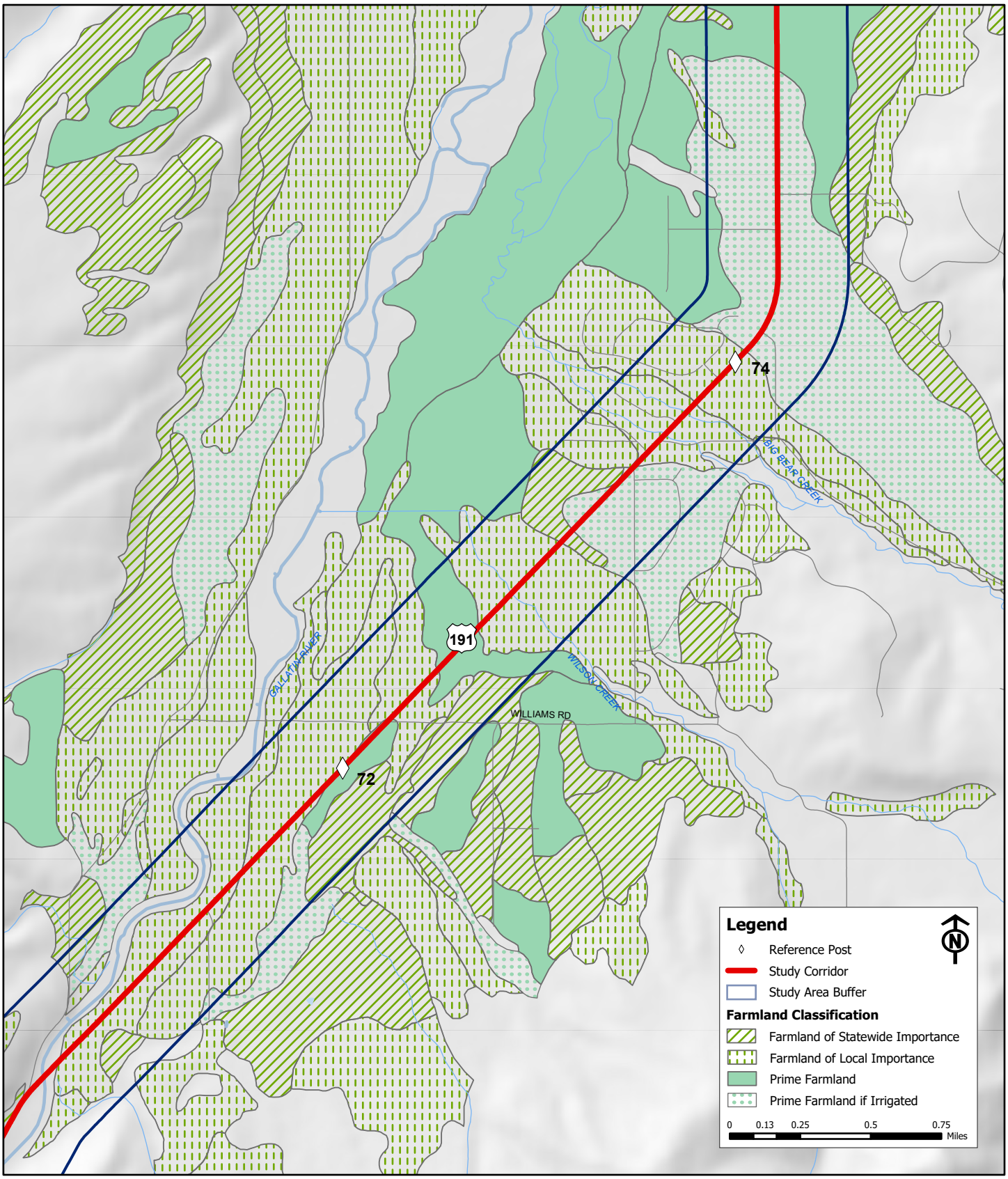





**Figure A.4: NRCS Farmland Classification**

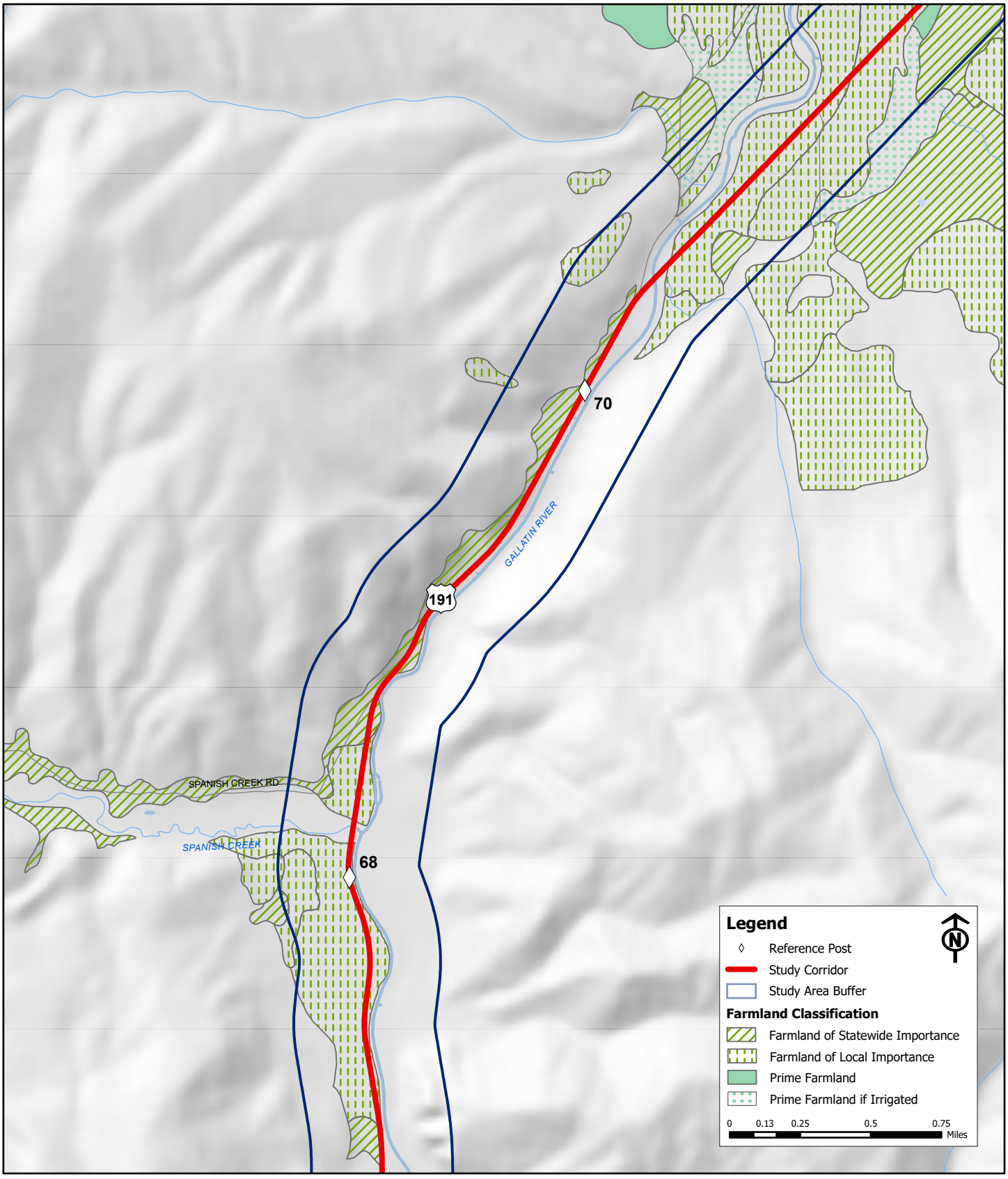





**Figure A.4: NRCS Farmland Classification**

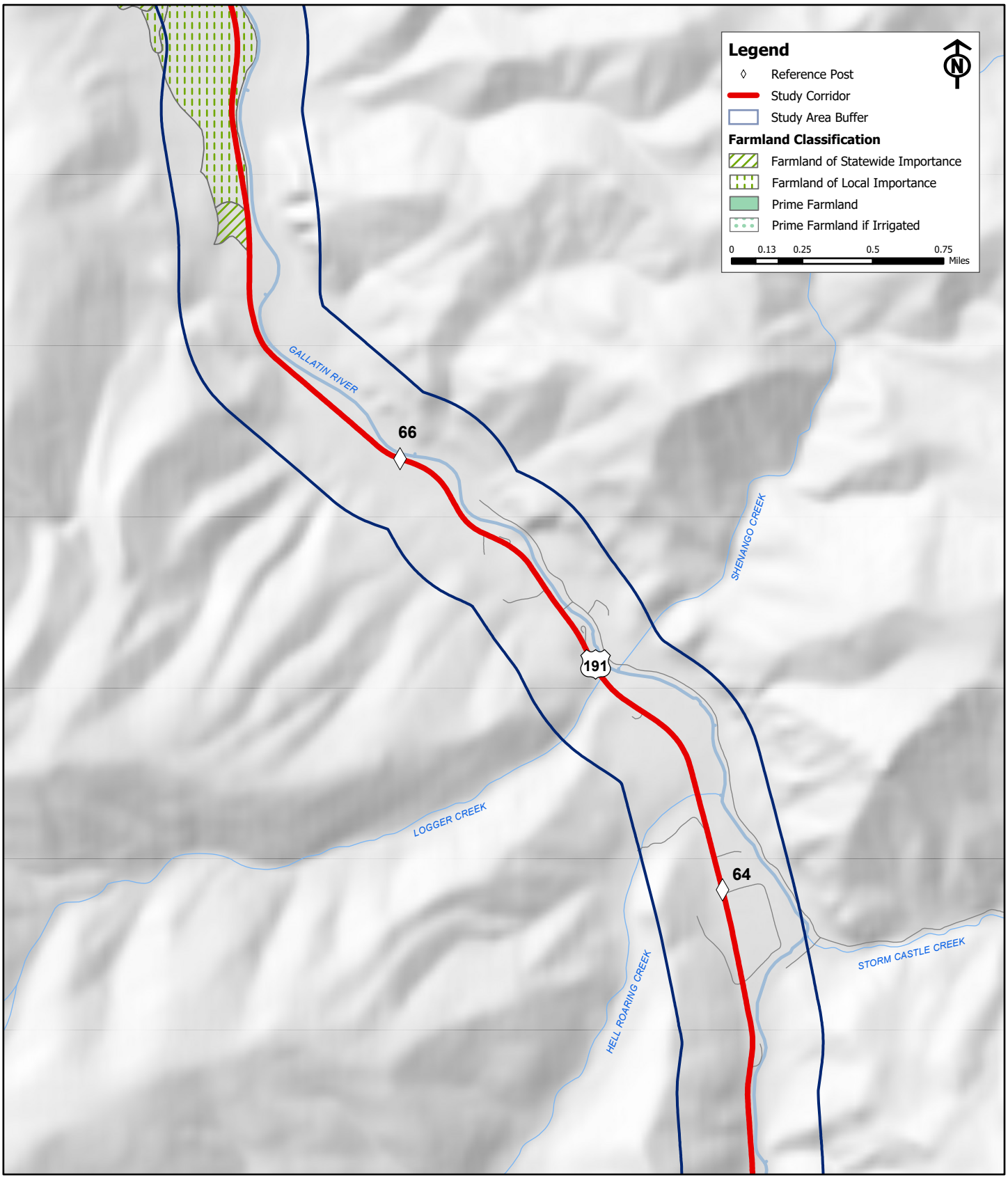





**Figure A.4: NRCS Farmland Classification**

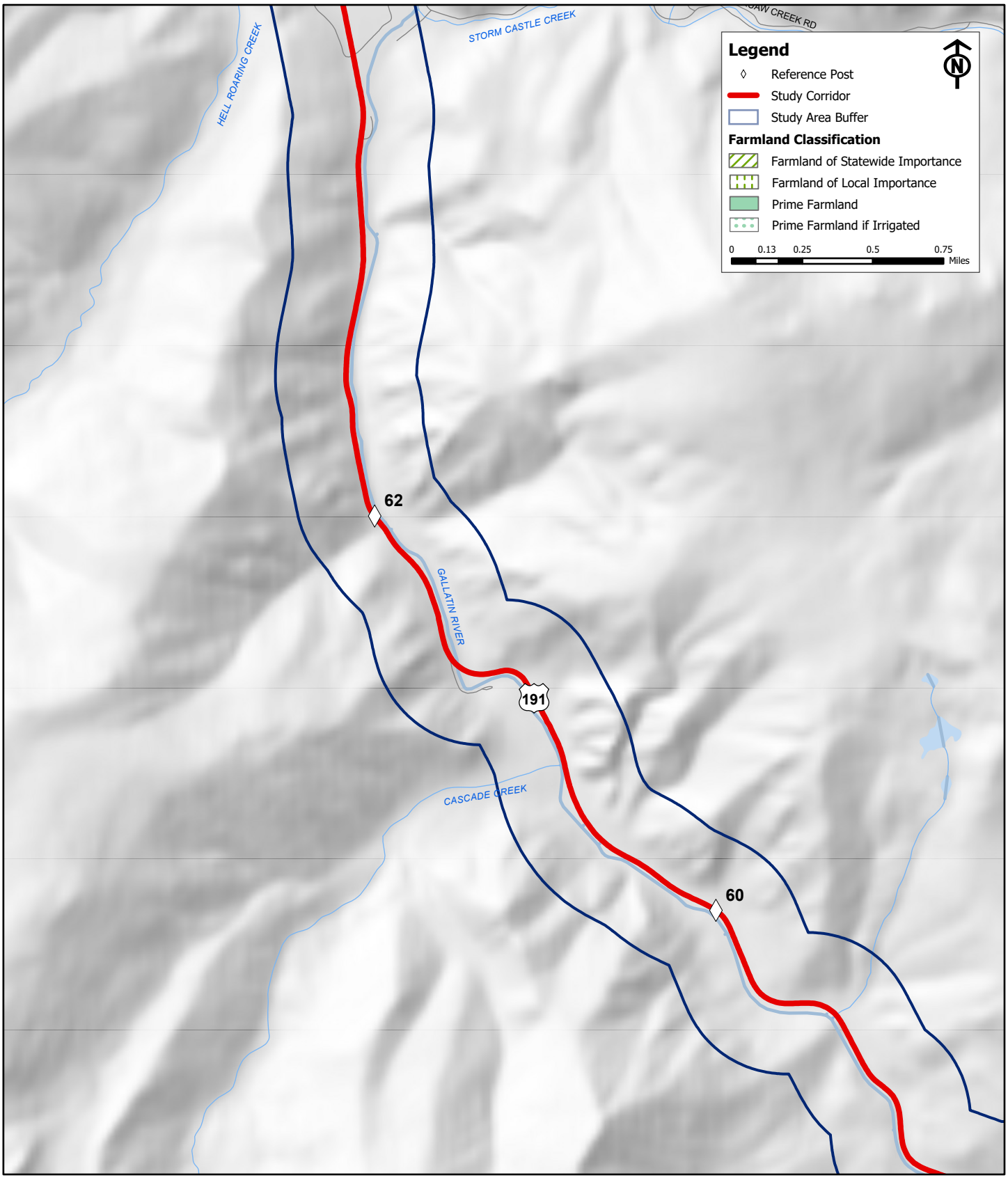



**Figure A.4: NRCS Farmland Classification**

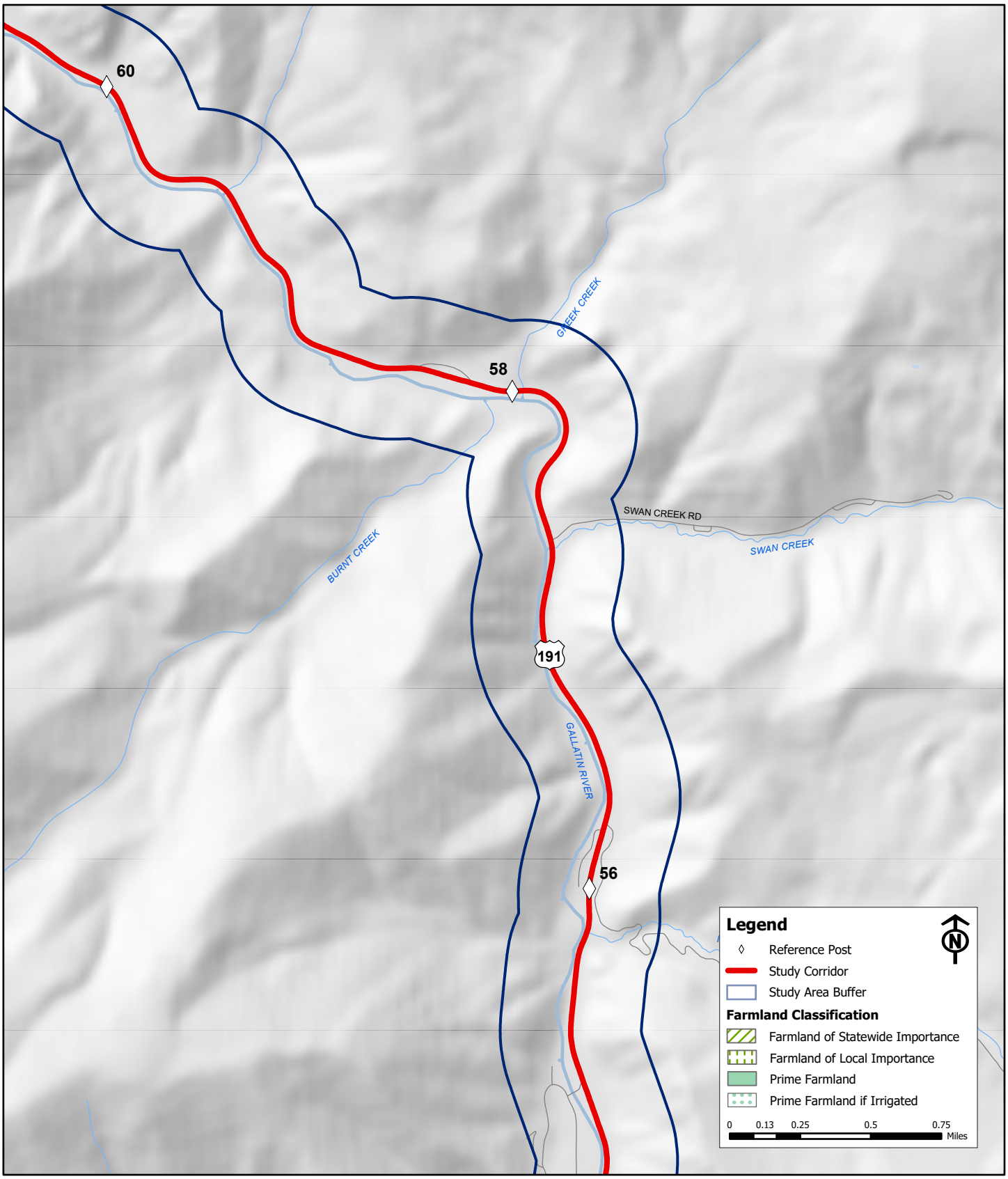





**Figure A.4: NRCS Farmland Classification**

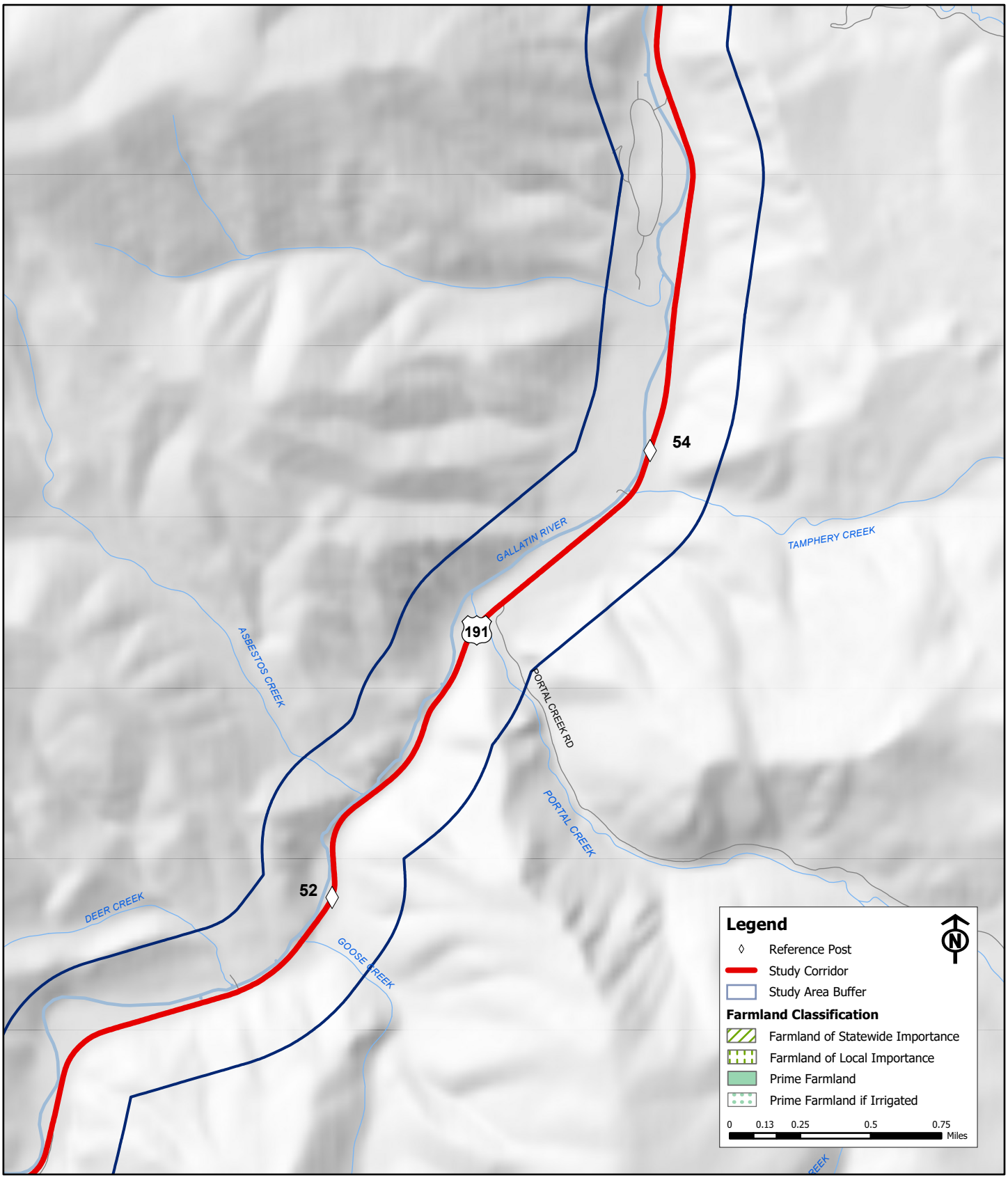





**Figure A.4: NRCS Farmland Classification**

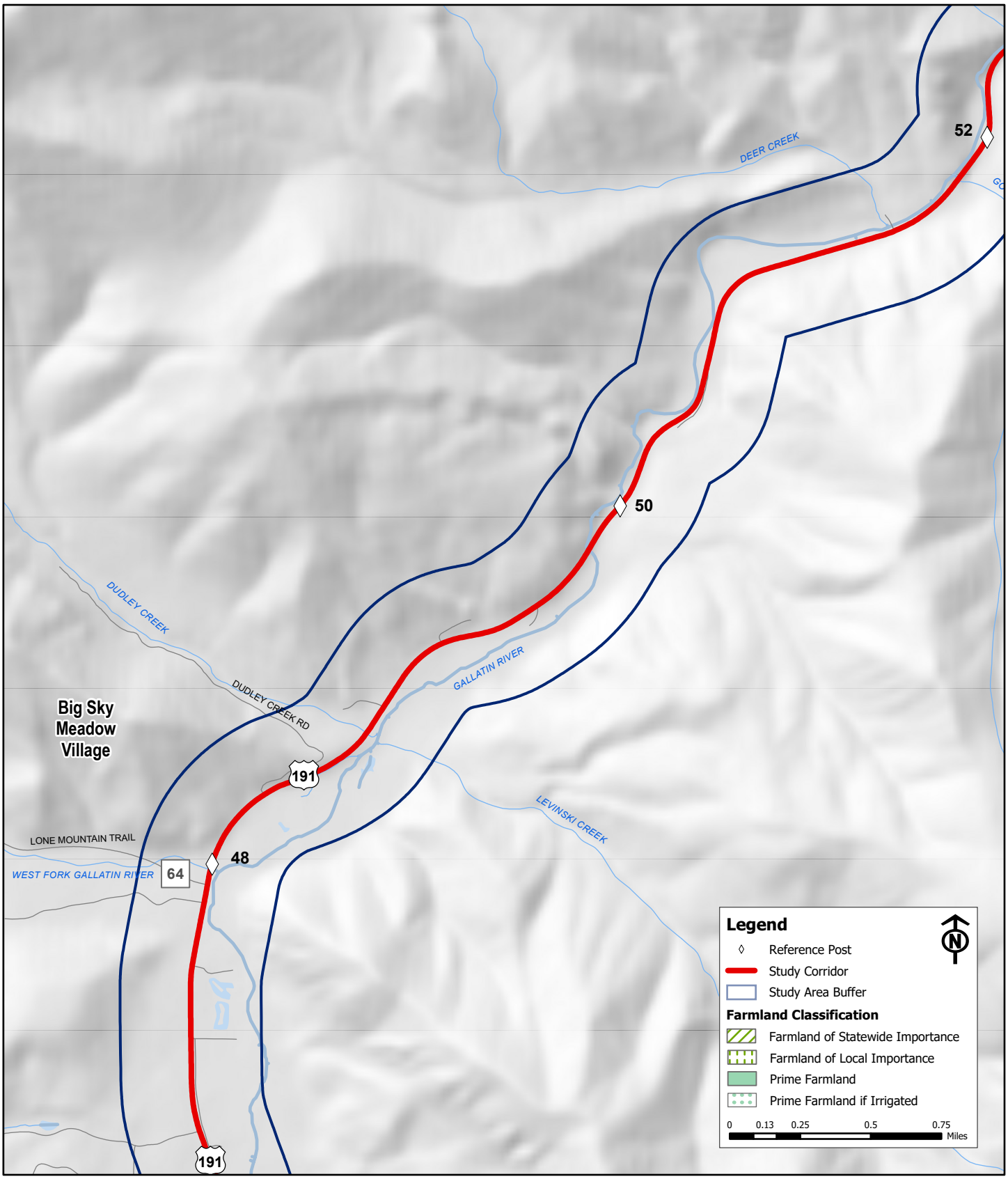



**Figure A.4: NRCS Farmland Classification**

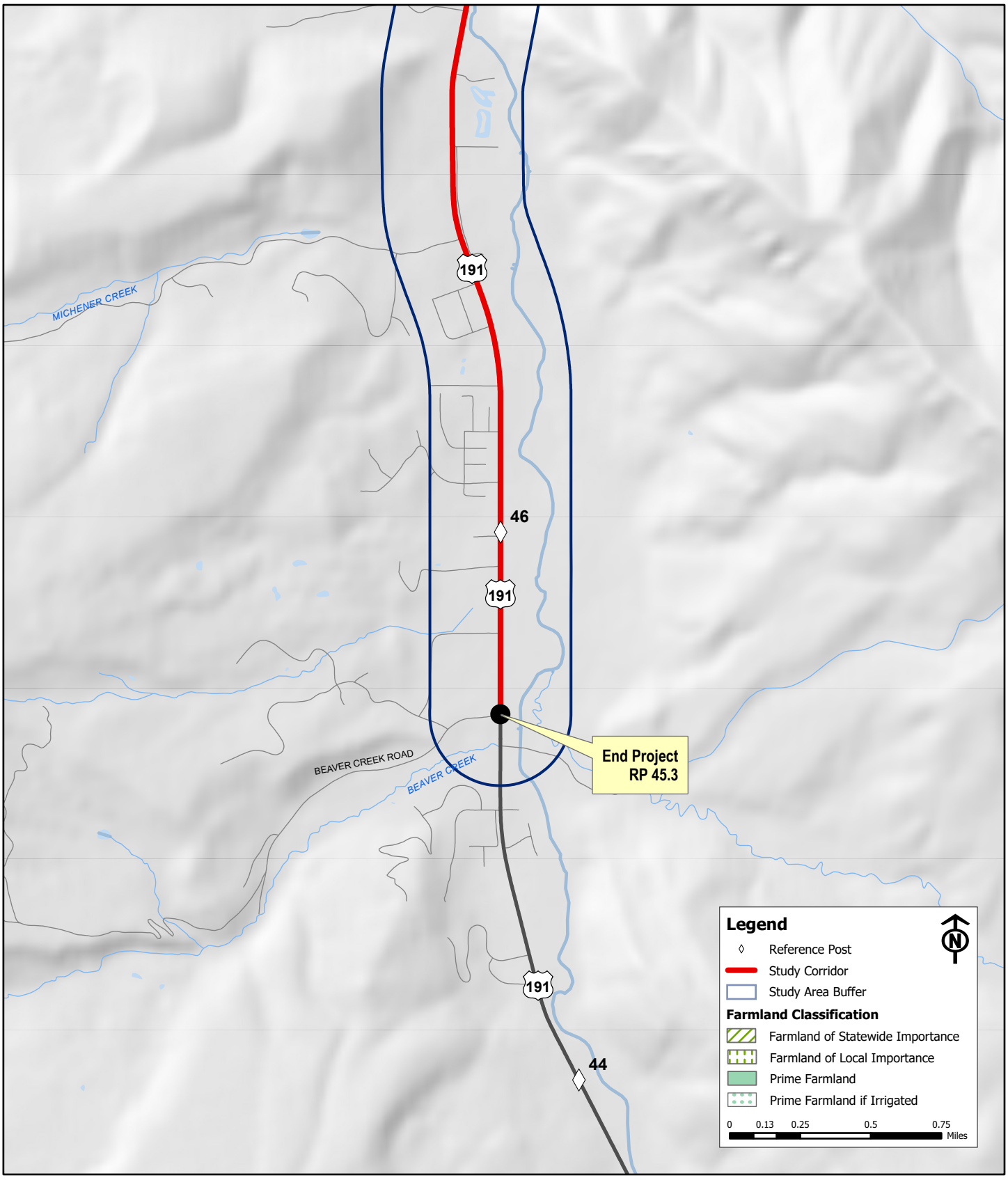





**Figure A.4: NRCS Farmland Classification**

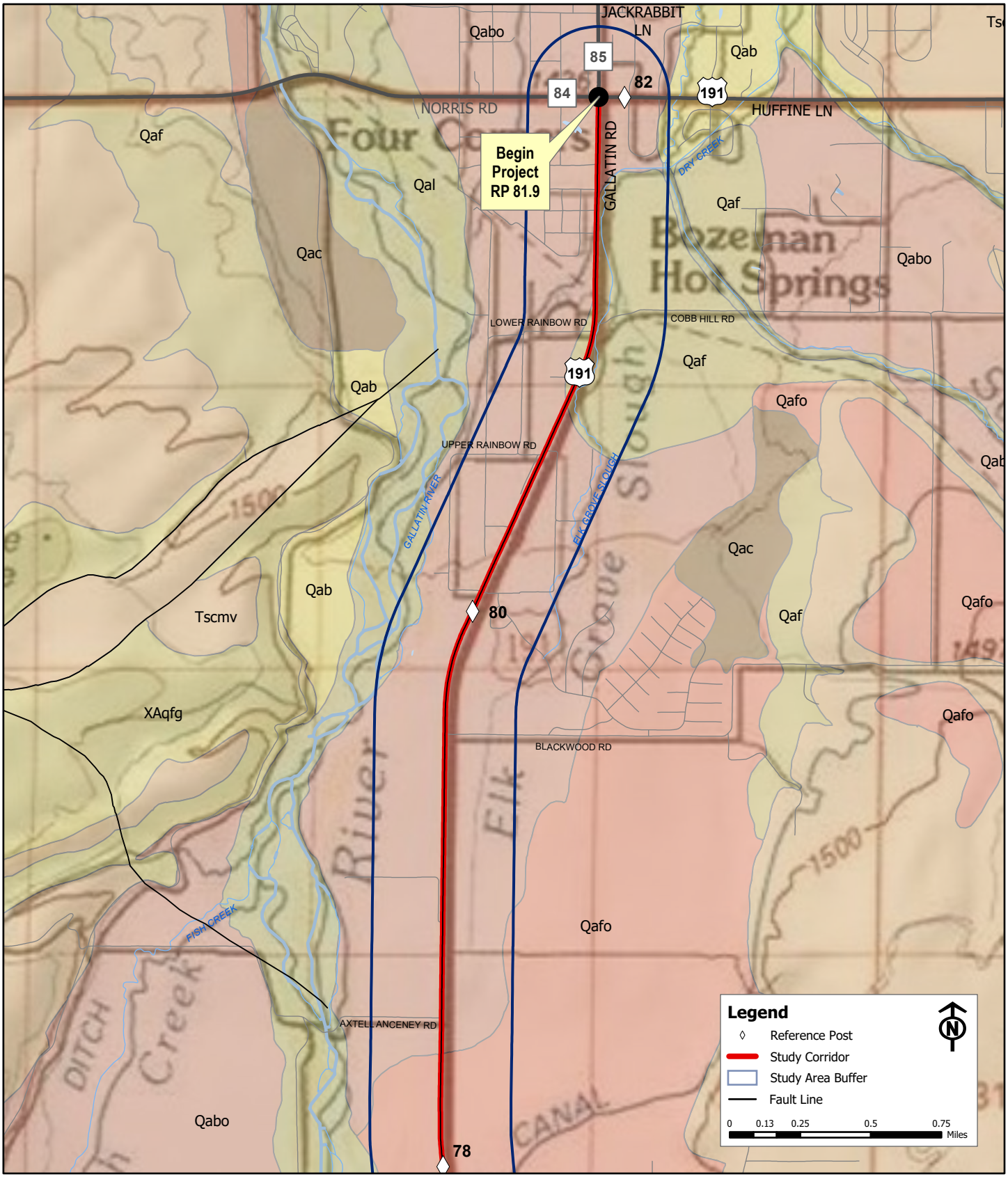





**Figure A.5: Geological Features**

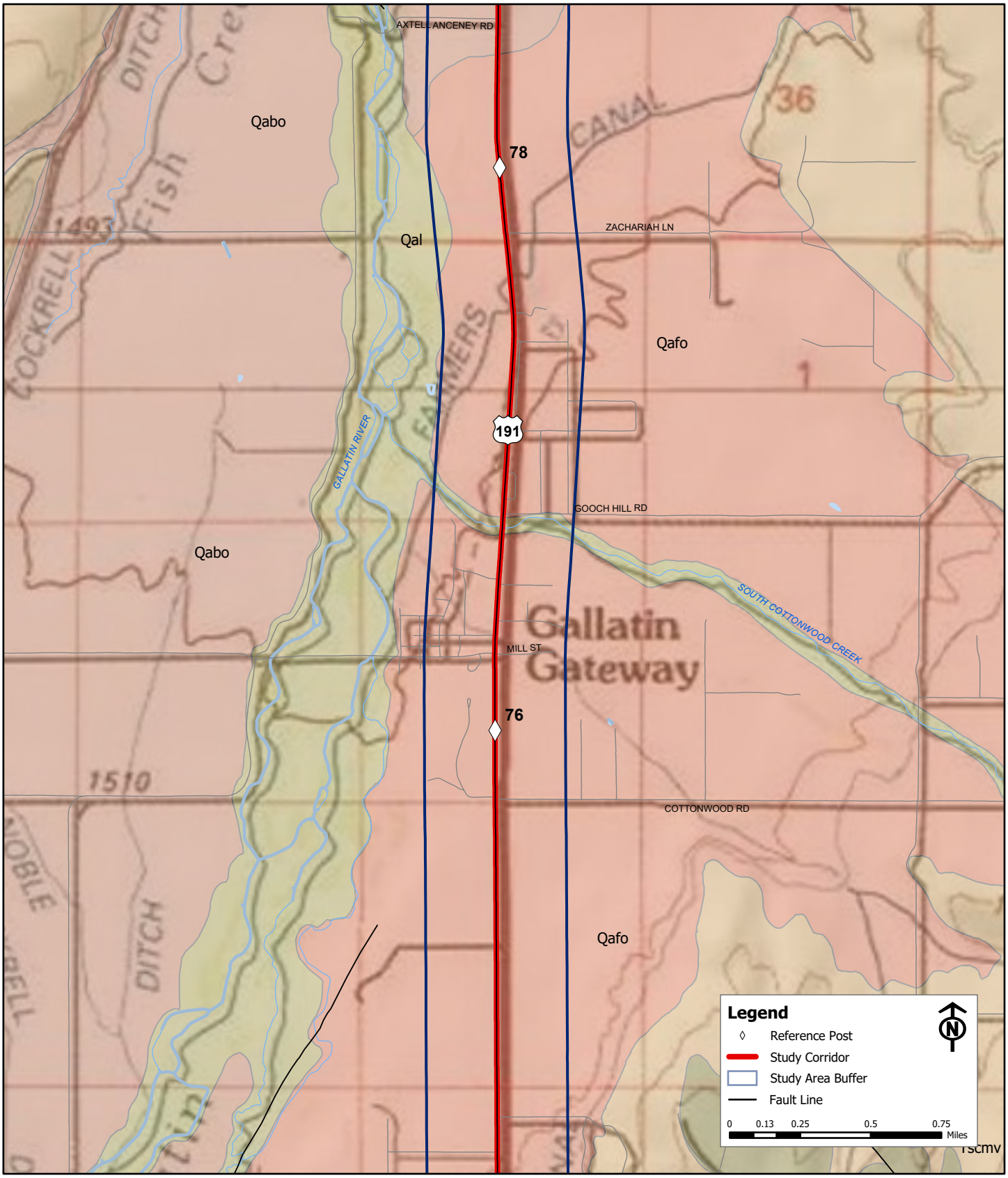
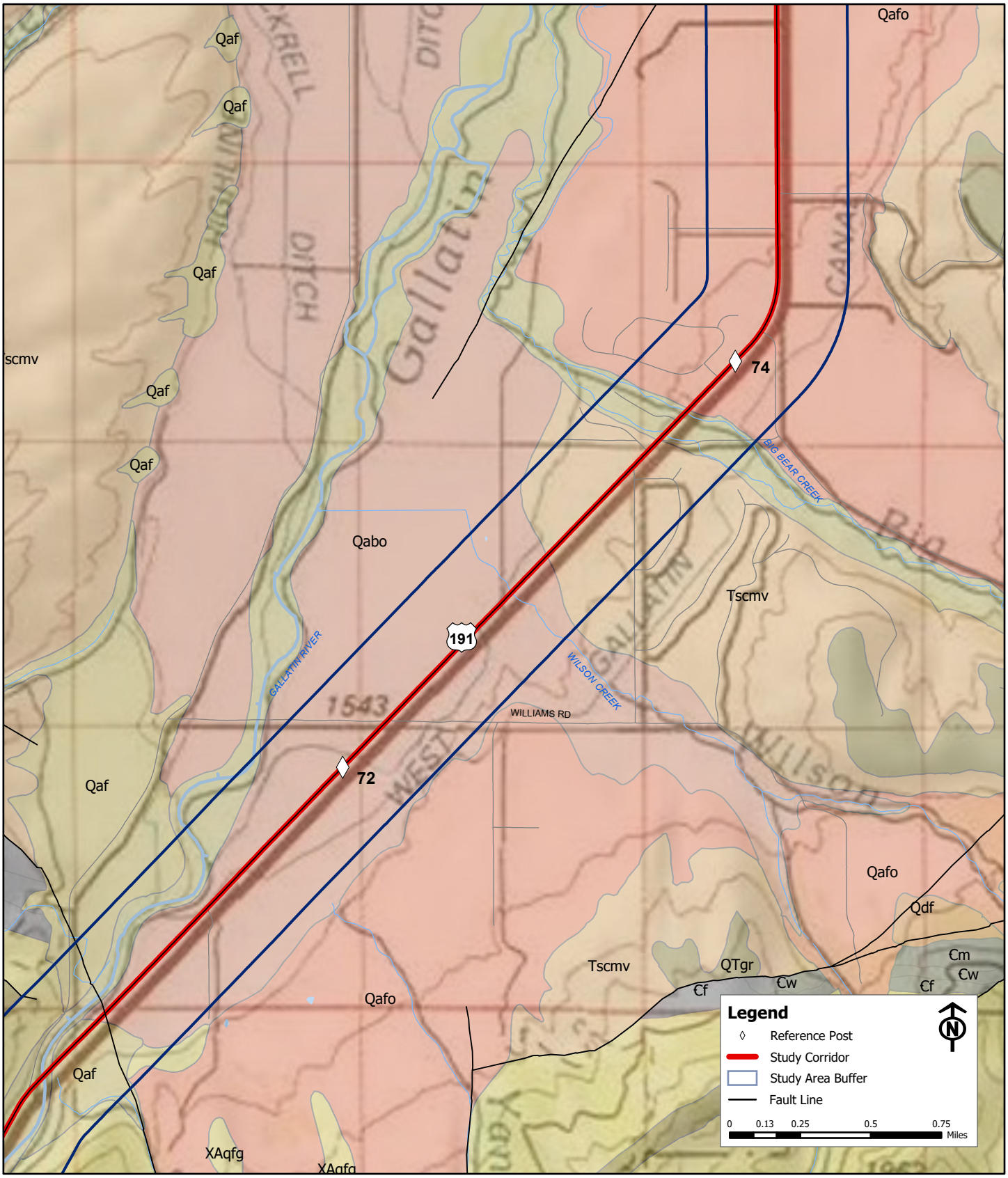



**Figure A.5: Geological Features**


Qaf
Qaf
Qaf
Qaf
Qaf
scmv
Qafo
74
BIG BEAR CREEK
Qabo
Tscmv
191
GALLATIN RIVER
WILSON CREEK
1543
WILLIAMS RD
72
Qaf
Qafo
Qdf
Tscmv
QTgr
Cm
Cw
Cf
Cw
Cf
Qafo
Qaf
XAqfg
XAqfg
Legend
Reference Post
Study Corridor
Study Area Buffer
Fault Line
0 0.13 0.25 0.5 0.75
Miles

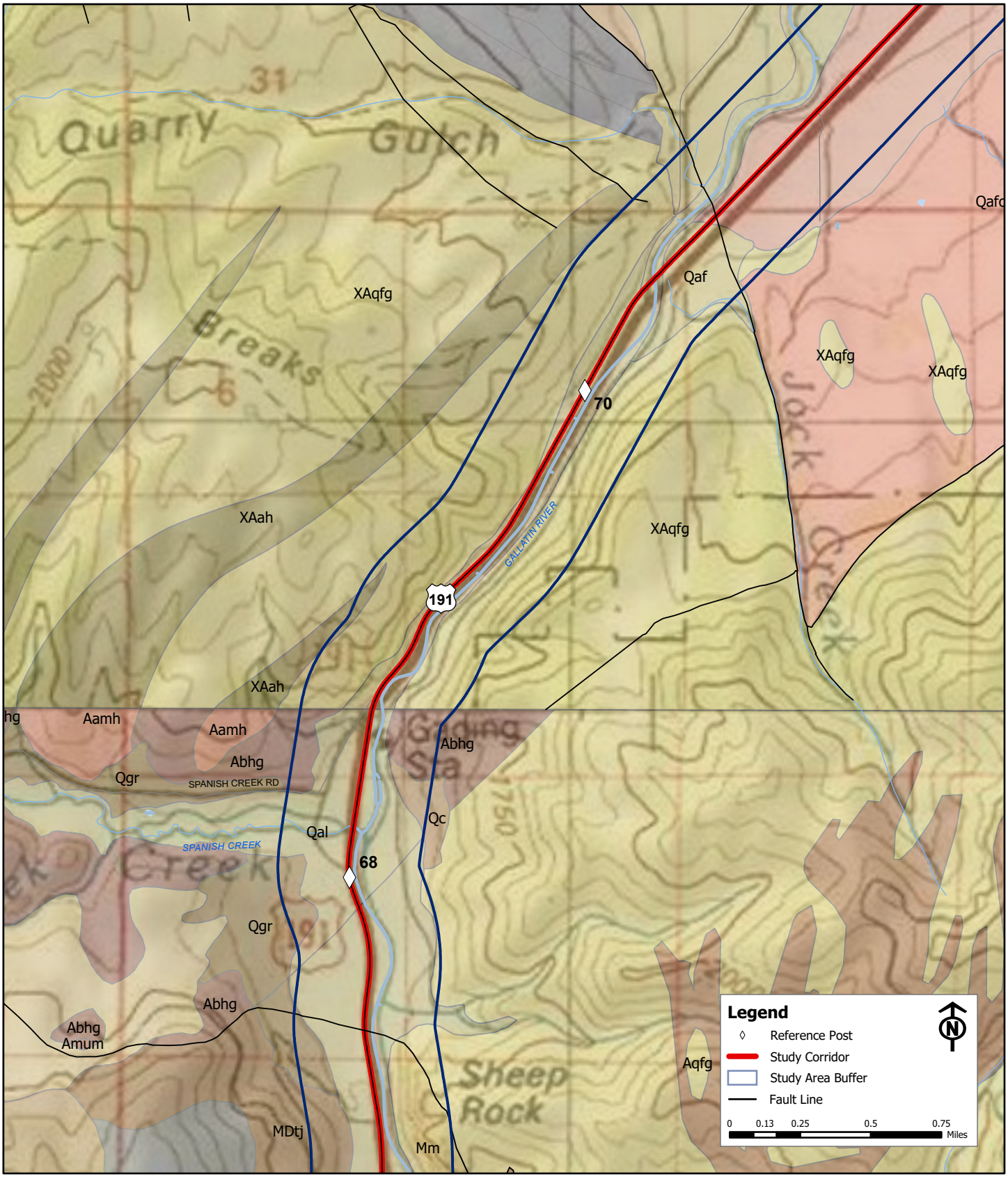



**Figure A.5: Geological Features**

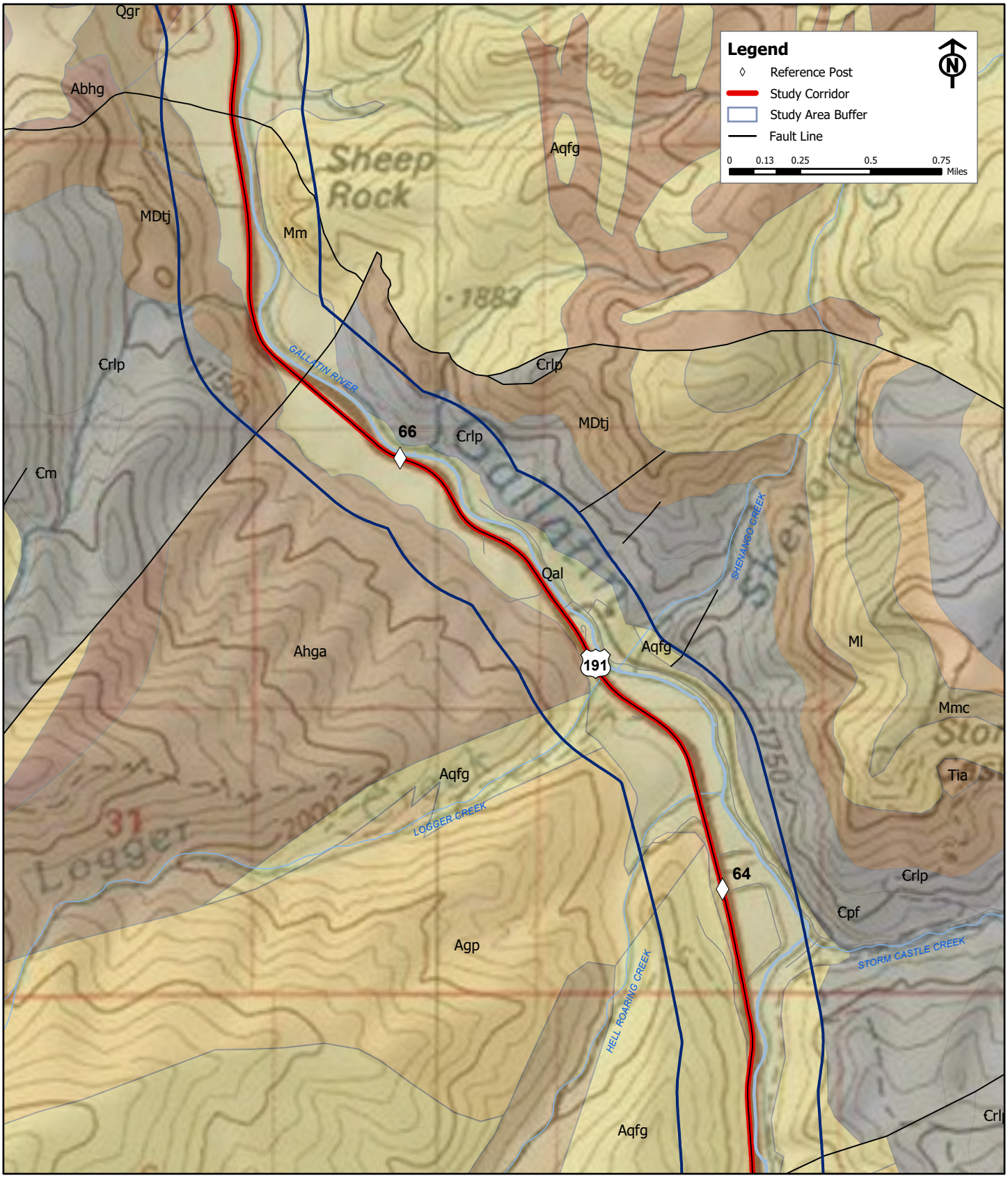





**Figure A.5: Geological Features**

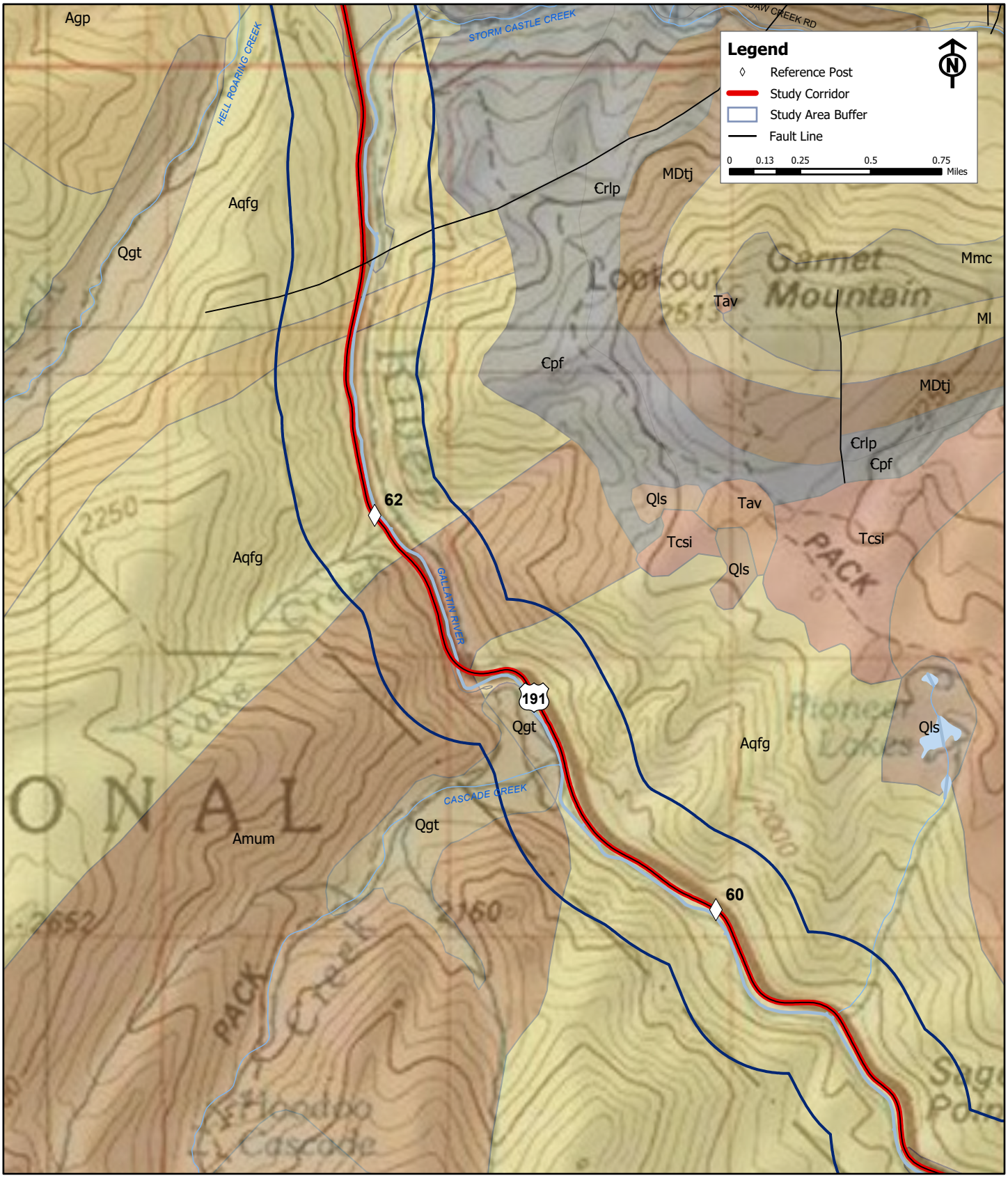



**Figure A.5: Geological Features**

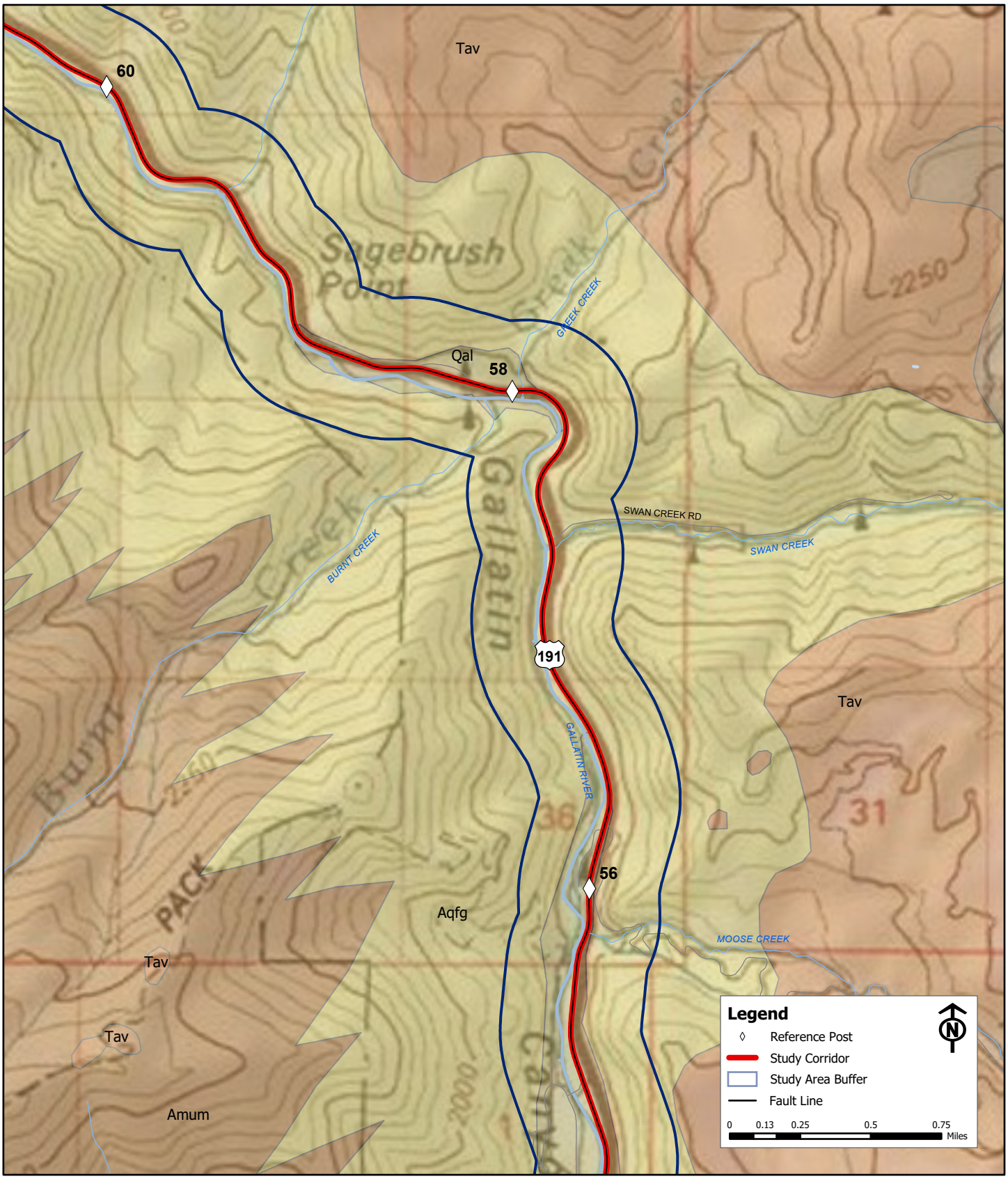





**Figure A.5: Geological Features**

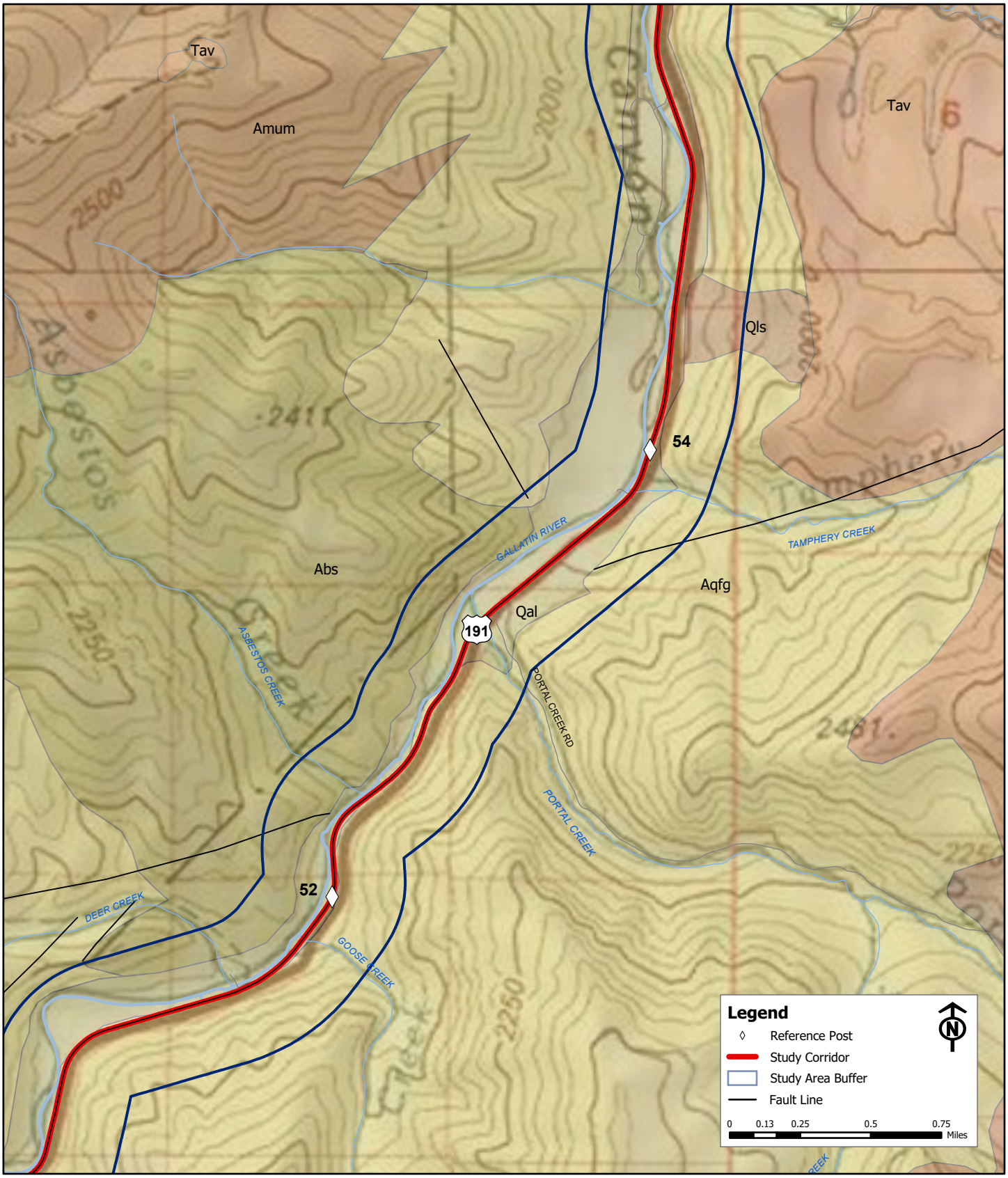





**Figure A.5: Geological Features**

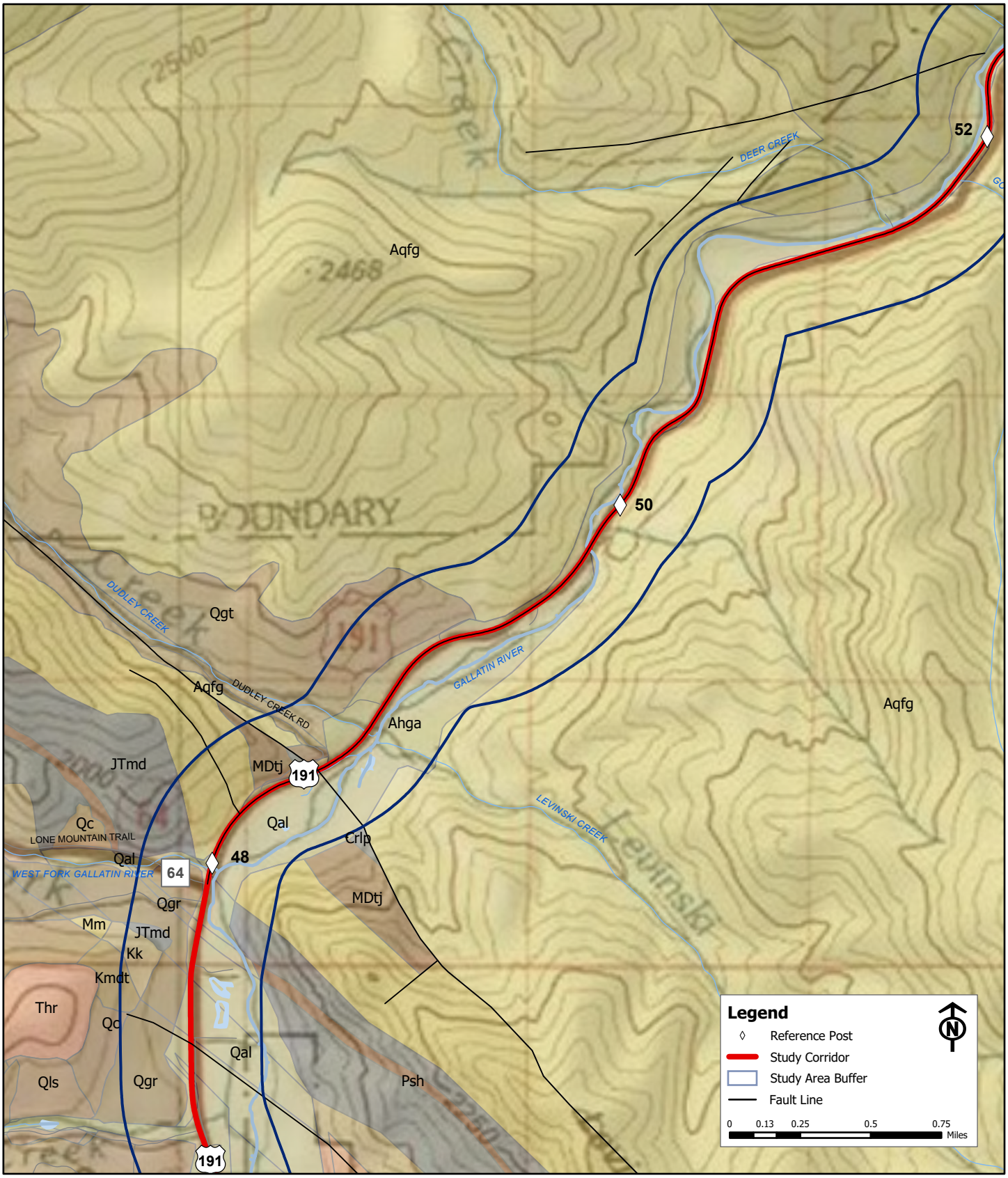
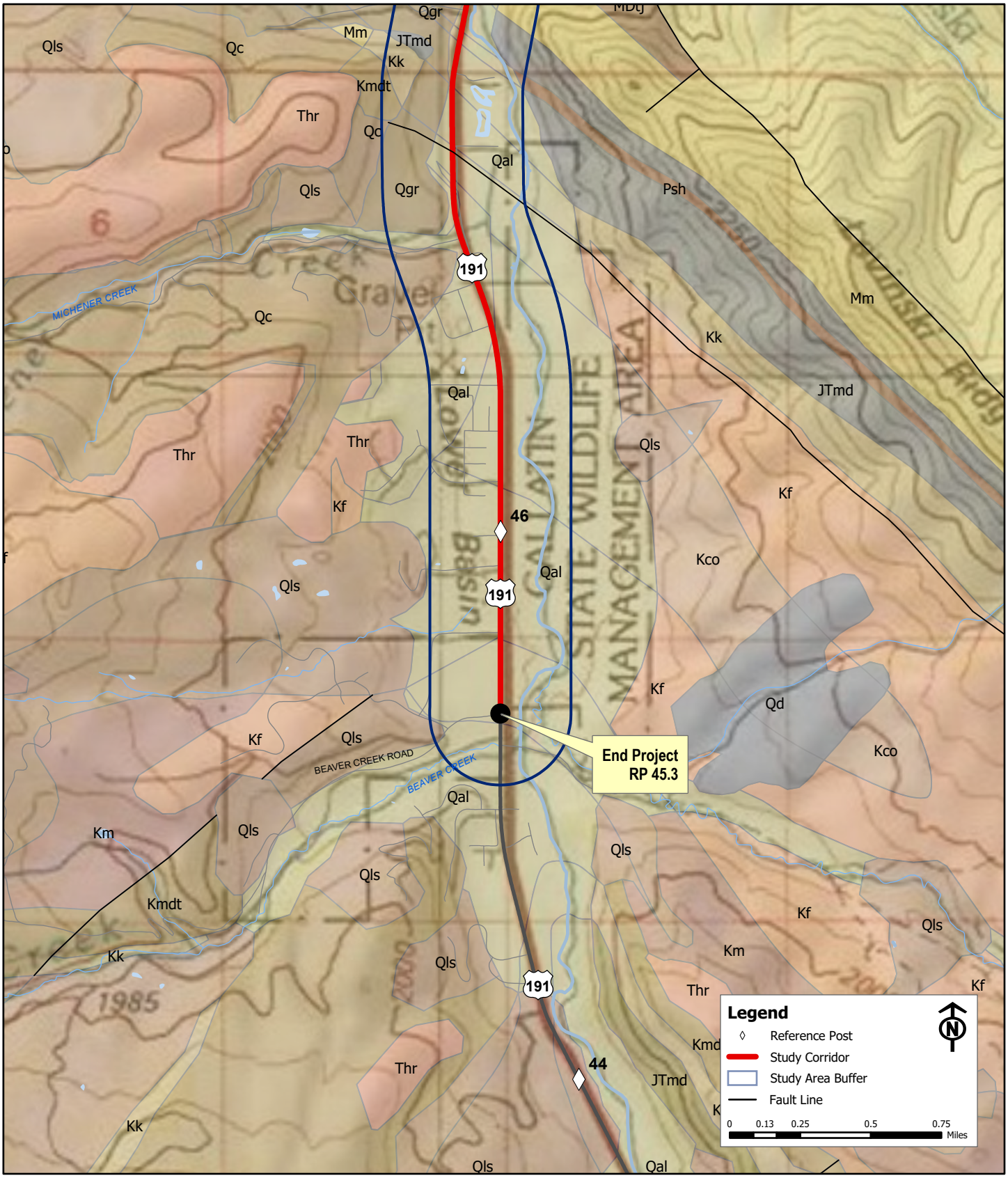



**Figure A.5: Geological Features**


Qgr
Mm
JTmd
Kk
Kmdt
Thr
Qc
Qls
Qal
Psh
191
MICHENER CREEK
Qc
Mm
Kk
JTmd
Qal
Thr
Qls
Kf
46
Qal
191
Kco
Qls
Kf
Qd
Kf
Qls
BEAVER CREEK ROAD
BEAVER CREEK
End Project
RP 45.3
Kco
Qal
Km
Qls
Qls
Qls
Kmdt
Kf
Qls
Kk
Km
Qls
191
Thr
Kf
1985
Thr
Kmd
44
JTmd
Kk
Qls
Qal
Legend
Reference Post
Study Corridor
Study Area Buffer
Fault Line
0 0.13 0.25 0.5 0.75
Miles

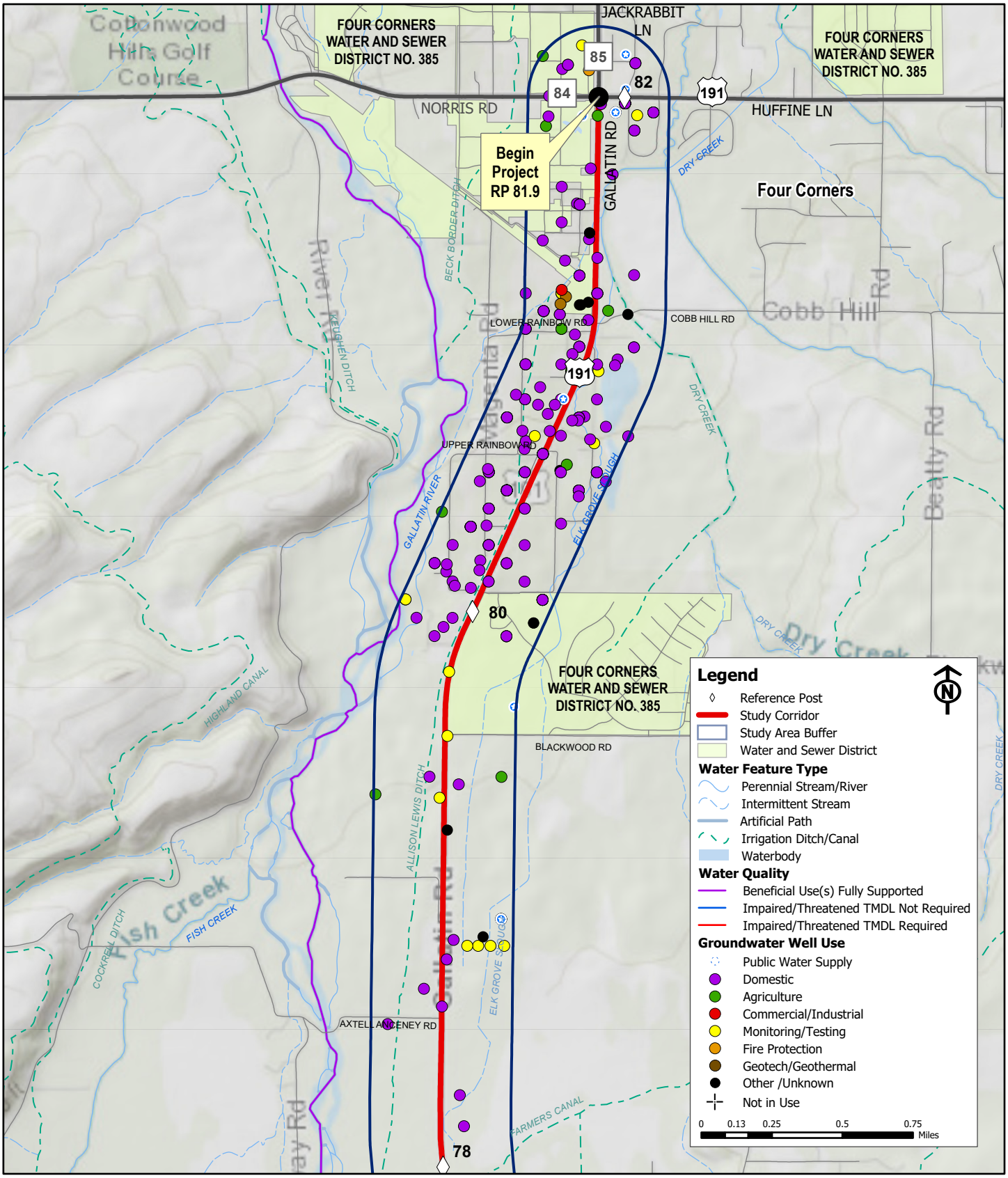





**Figure A.6: Water Features**

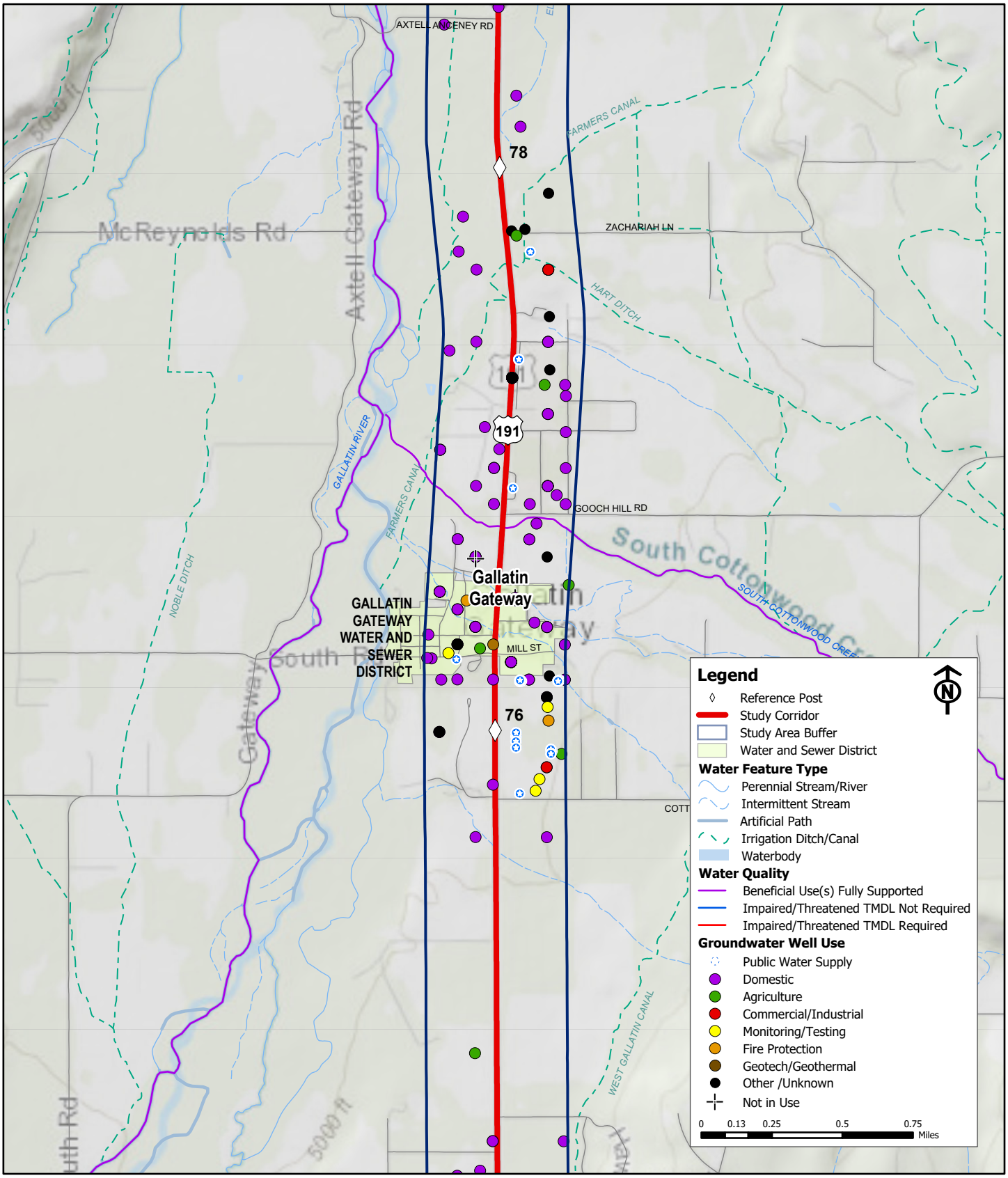
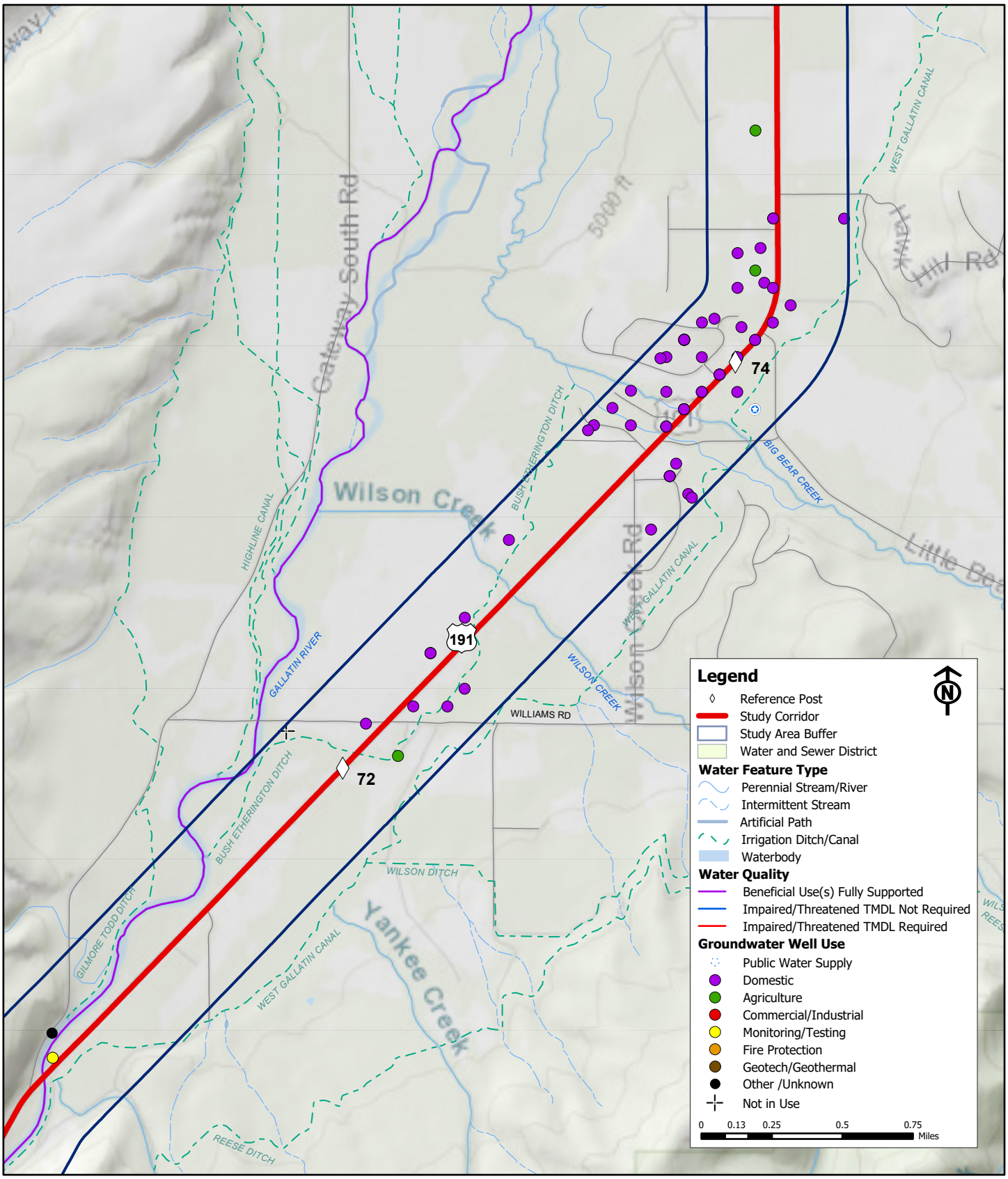





**Figure A.6: Water Features**


Legend
Reference Post
Study Corridor
Study Area Buffer
Water and Sewer District
Water Feature Type
Perennial Stream/River
Intermittent Stream
Artificial Path
Irrigation Ditch/Canal
Waterbody
Water Quality
Beneficial Use(s) Fully Supported
Impaired/Threatened TMDL Not Required
Impaired/Threatened TMDL Required
Groundwater Well Use
Public Water Supply
Domestic
Agriculture
Commercial/Industrial
Monitoring/Testing
Fire Protection
Geotech/Geothermal
Other /Unknown
Not in Use
0 0.13 0.25 0.5 0.75
Miles
N
74
191
72
Wilson Creek
Gateway South Rd
Wilson Creek Rd
WILLIAMS RD
WILSON CREEK
WILSON DITCH
Yankee Creek
GALLATIN RIVER
HIGHLINE CANAL
WEST GALLATIN CANAL
BUSH ETHERINGTON DITCH
BIG BEAR CREEK
GILMORE TODD DITCH
REESE DITCH
5000 ft

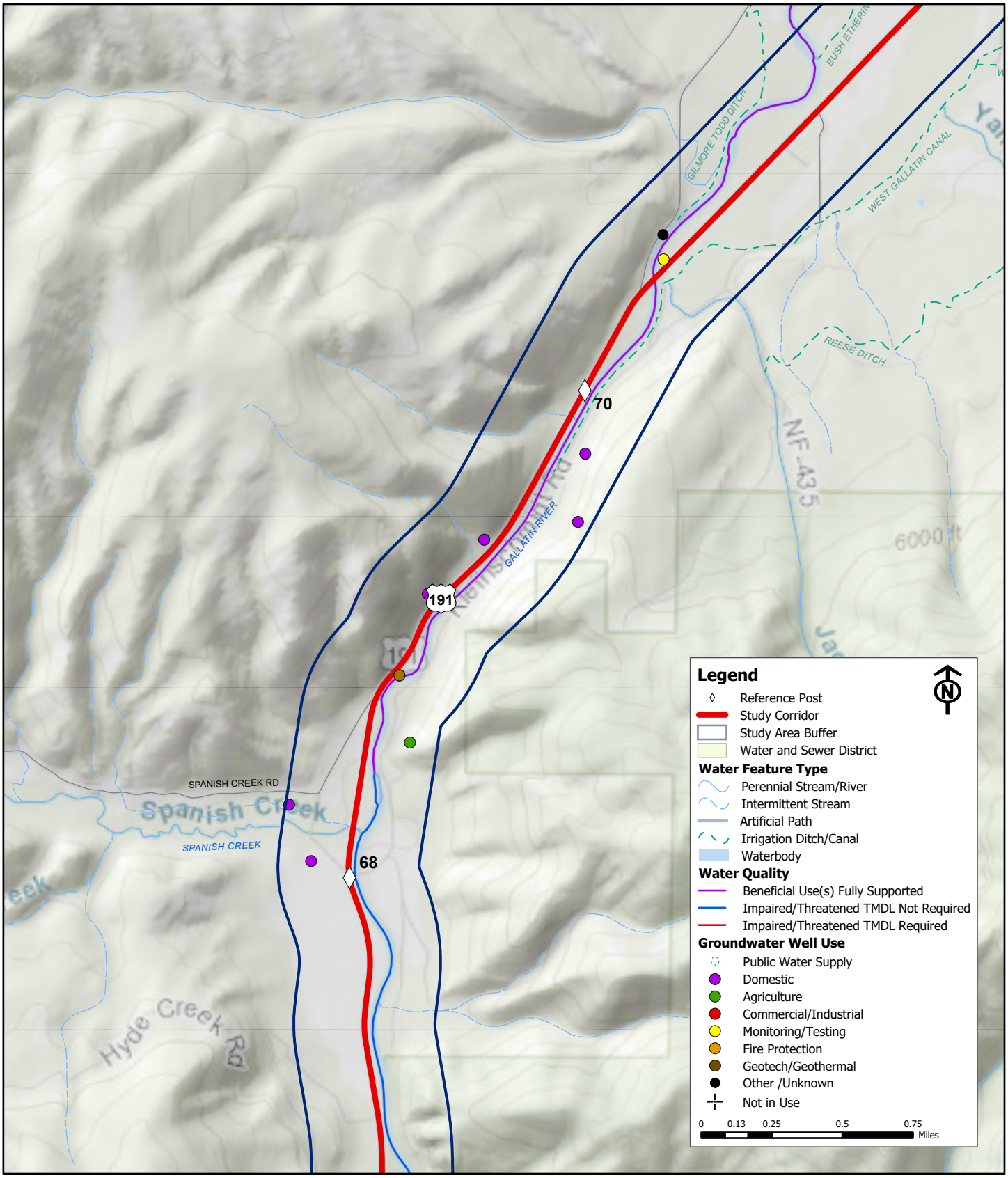





**Figure A.6: Water Features**

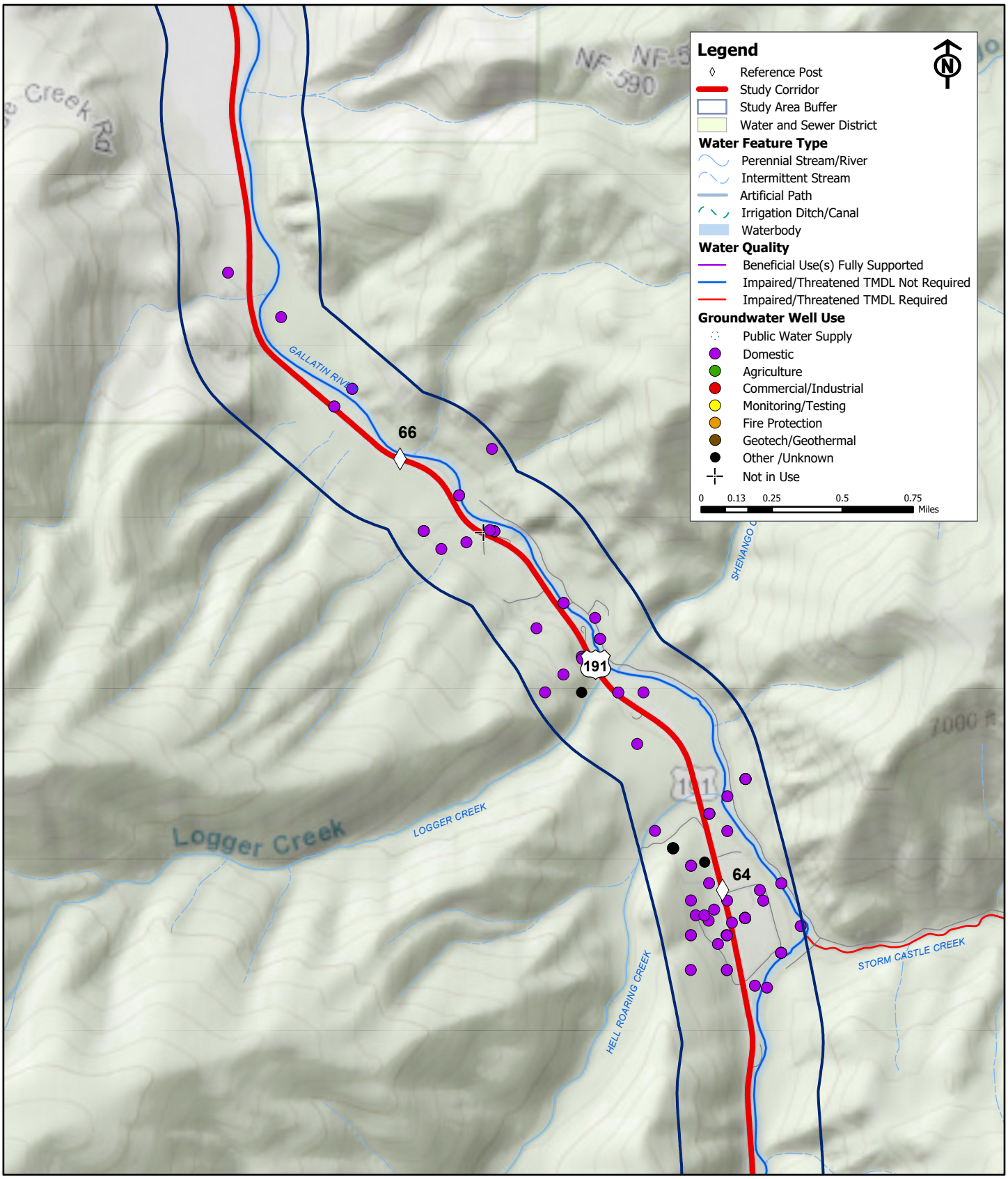



**Figure A.6: Water Features**

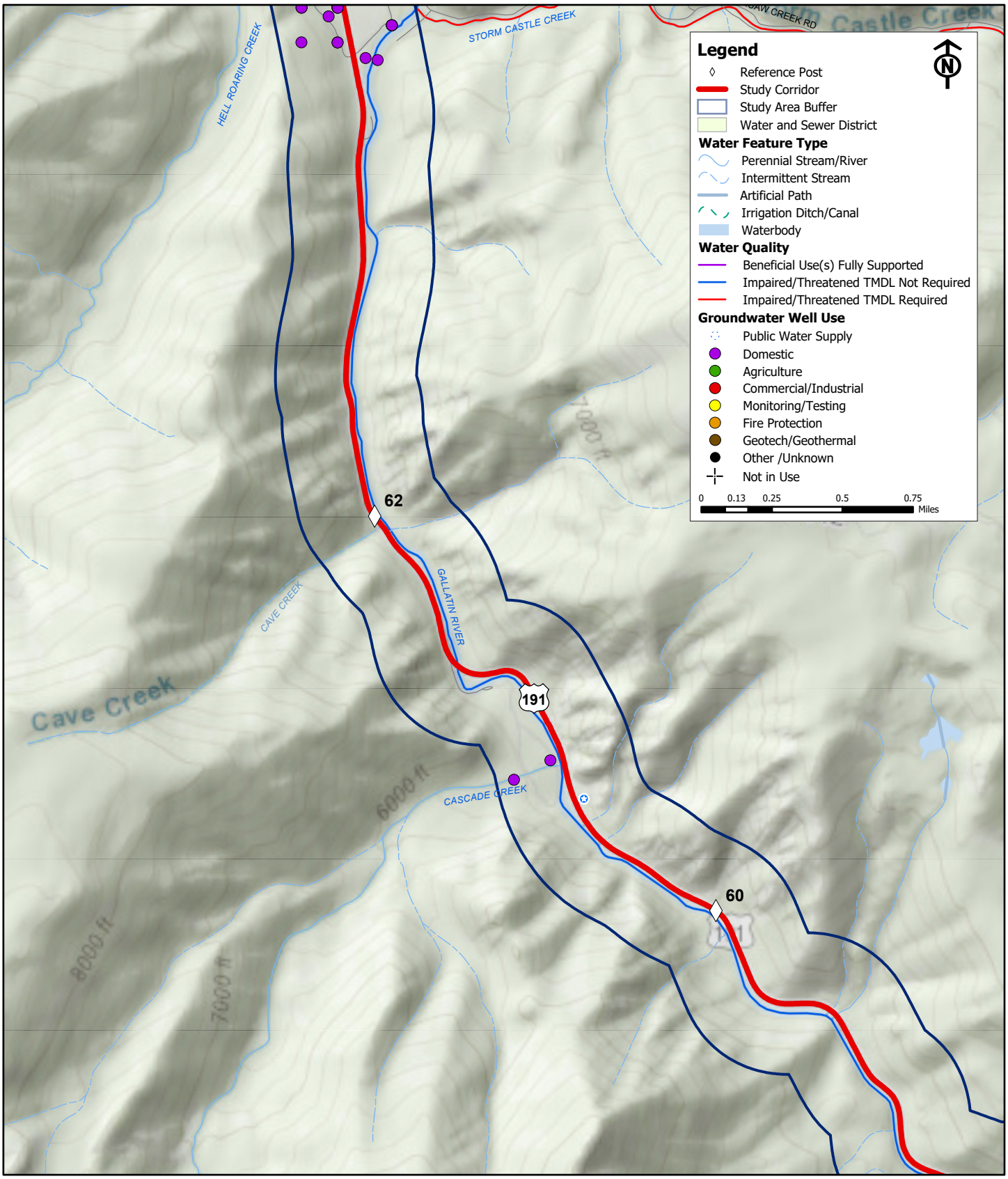





**Figure A.6: Water Features**

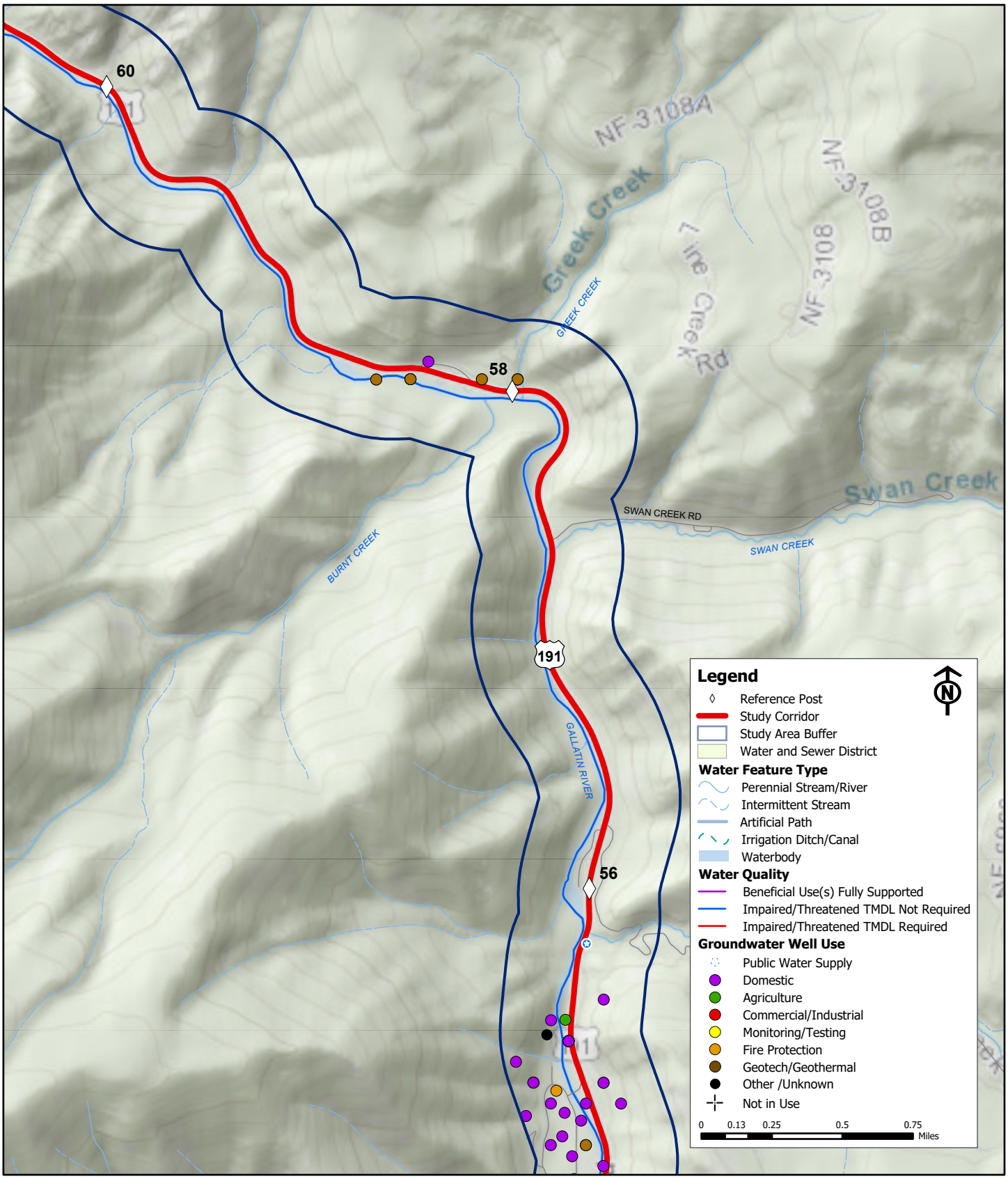





**Figure A.6: Water Features**

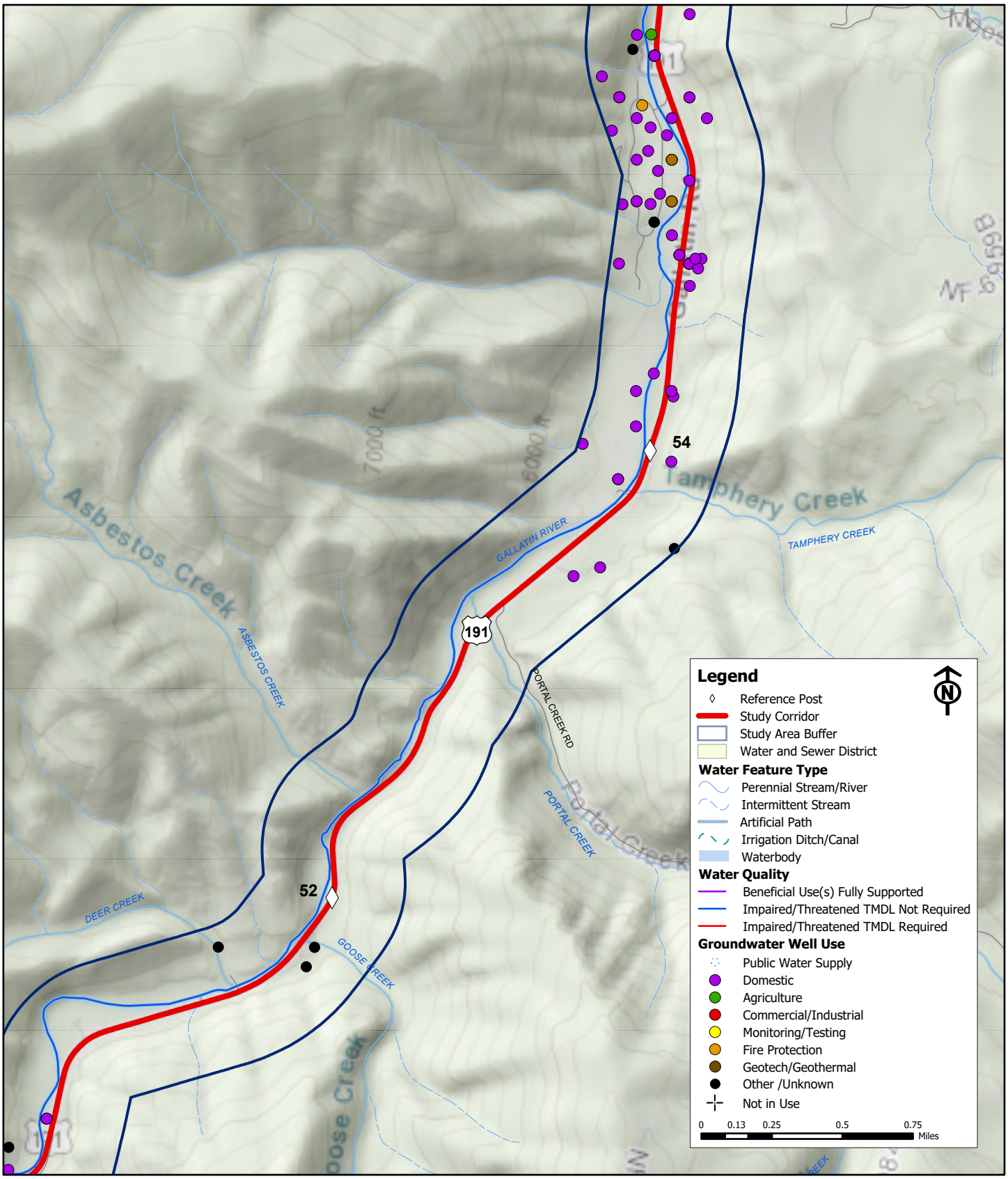





**Figure A.6: Water Features**

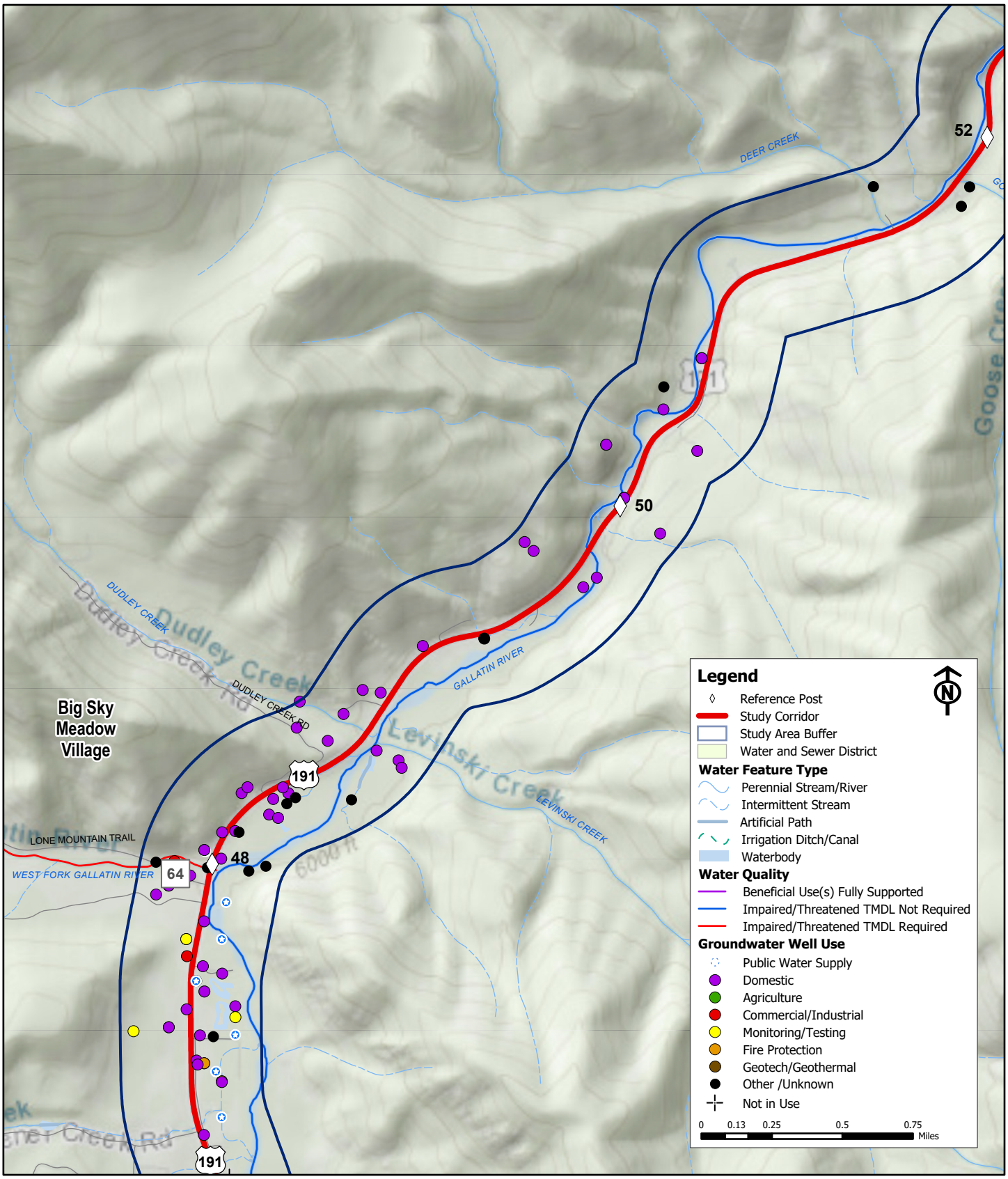



**Figure A.6: Water Features**

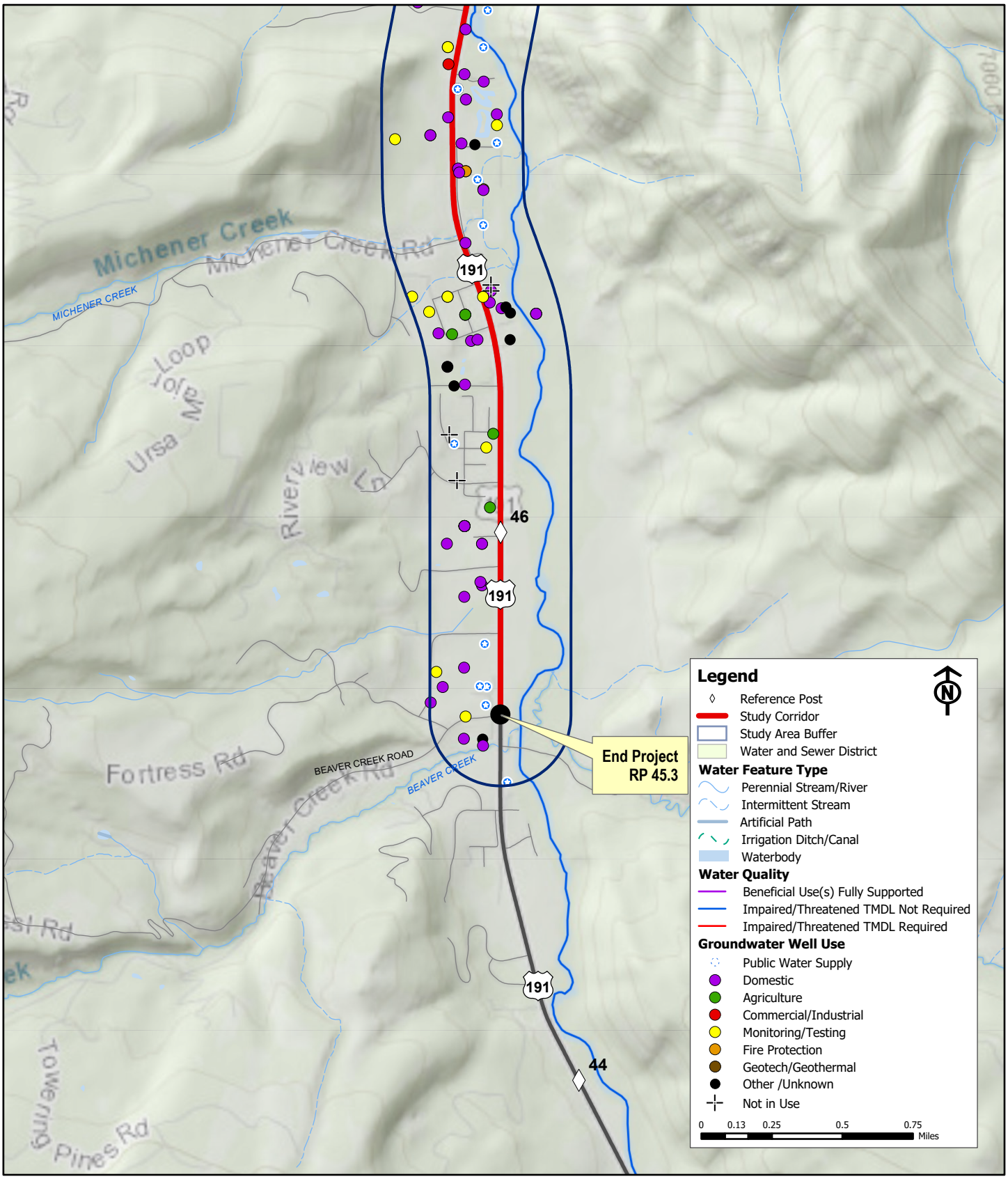





**Figure A.6: Water Features**

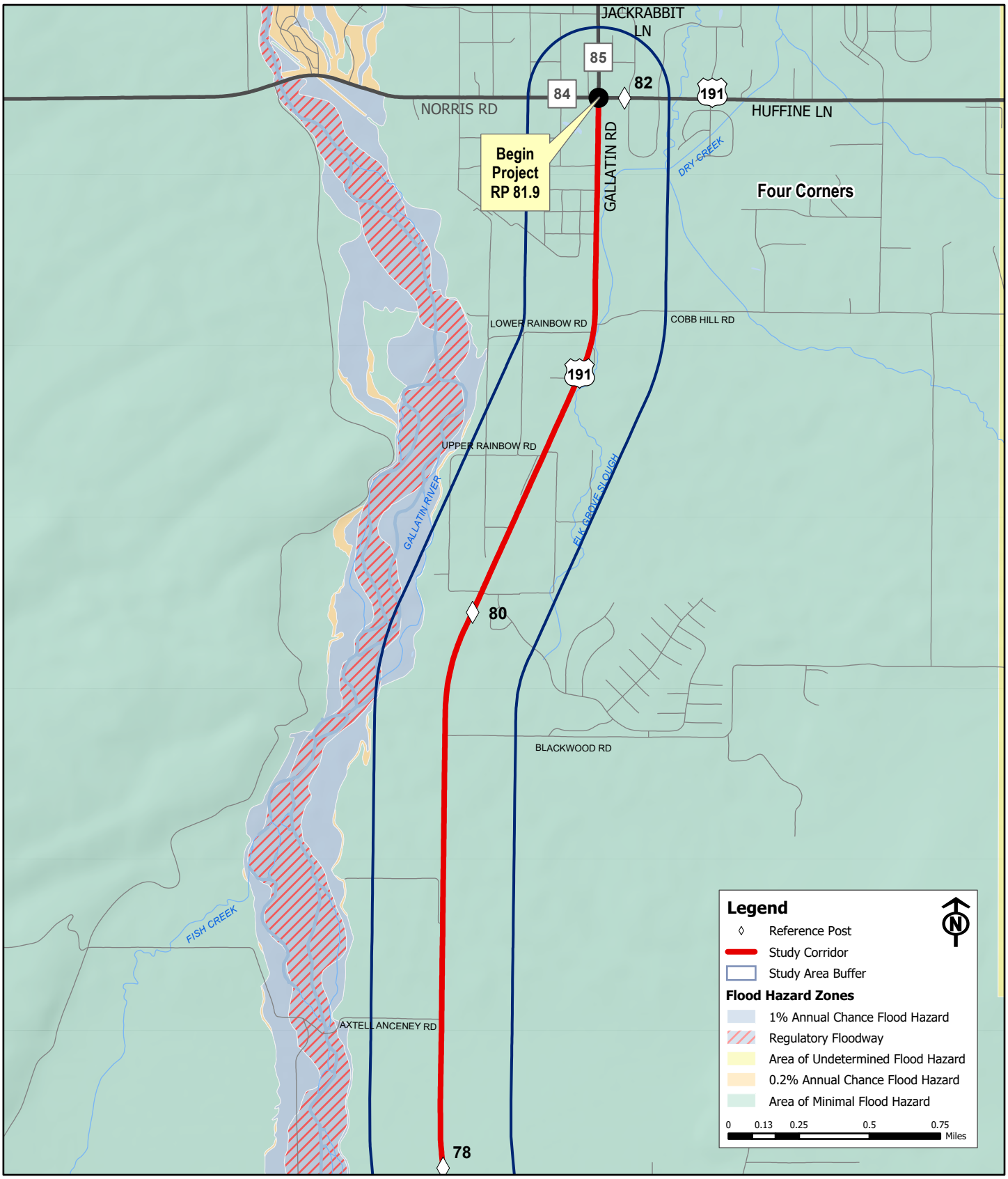



**Figure A.7: FEMA Floodplain Boundaries**

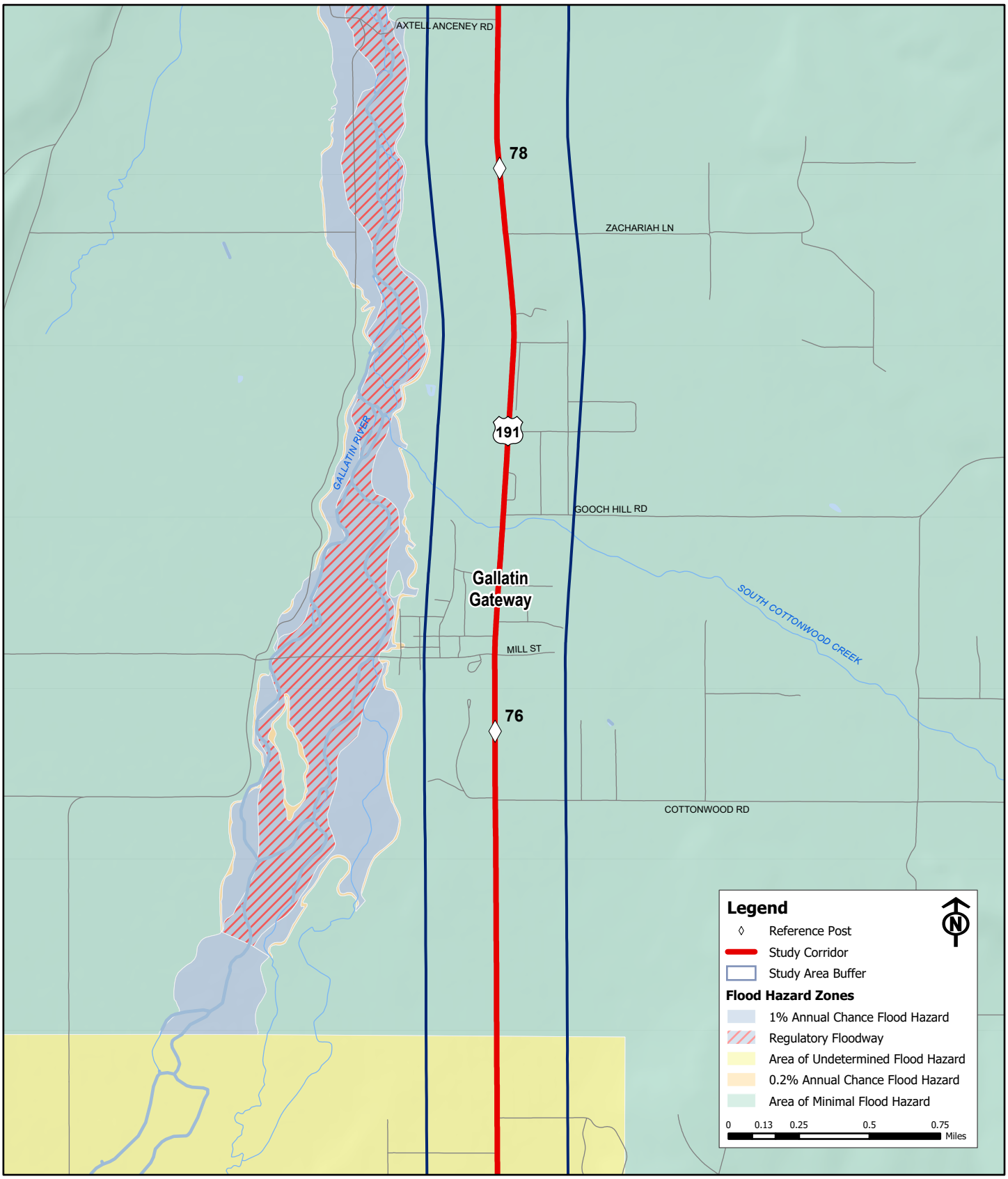



**Figure A.7: FEMA Floodplain Boundaries**

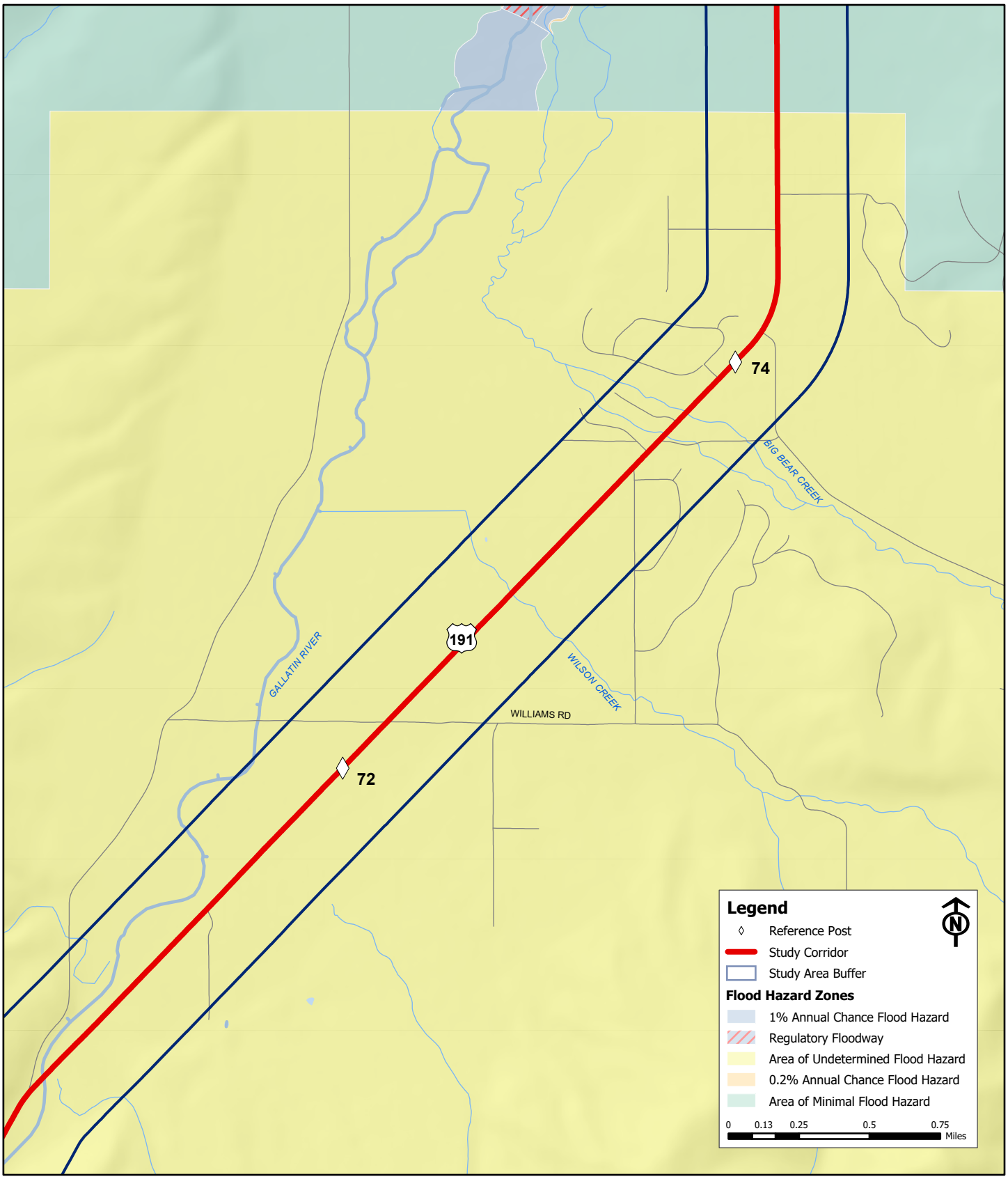





**Figure A.7: FEMA Floodplain Boundaries**

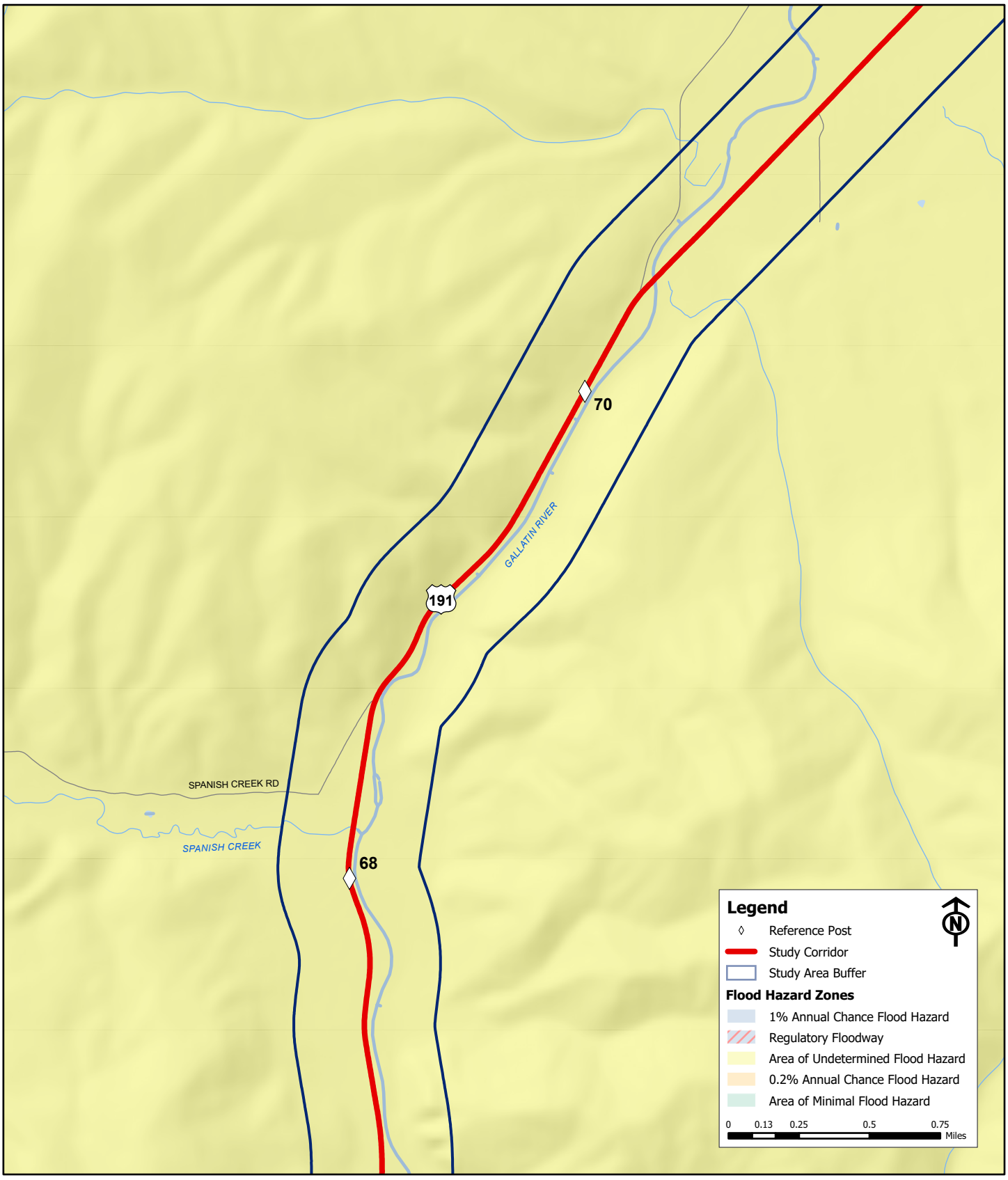





**Figure A.7: FEMA Floodplain Boundaries**

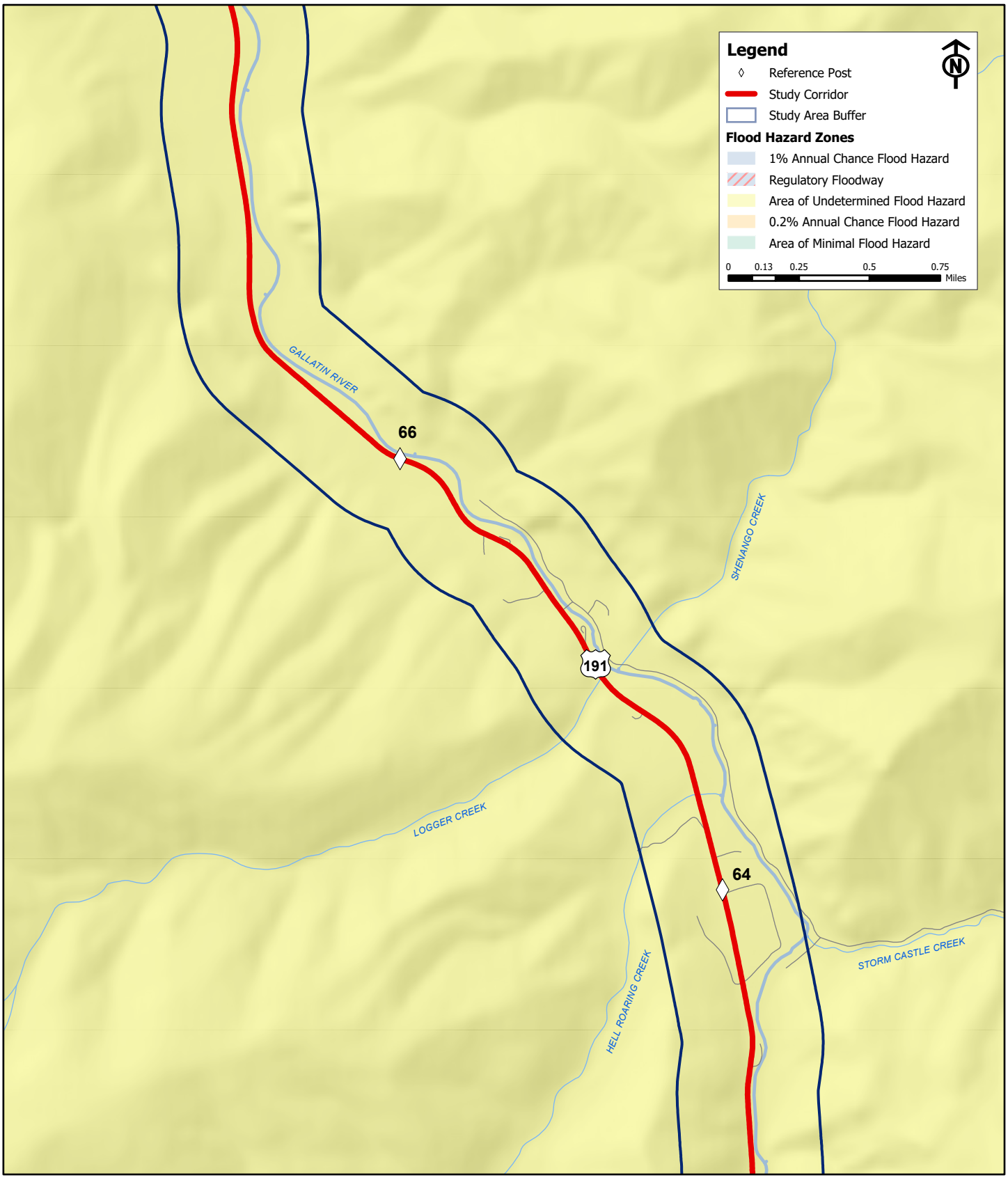



**Figure A.7: FEMA Floodplain Boundaries**

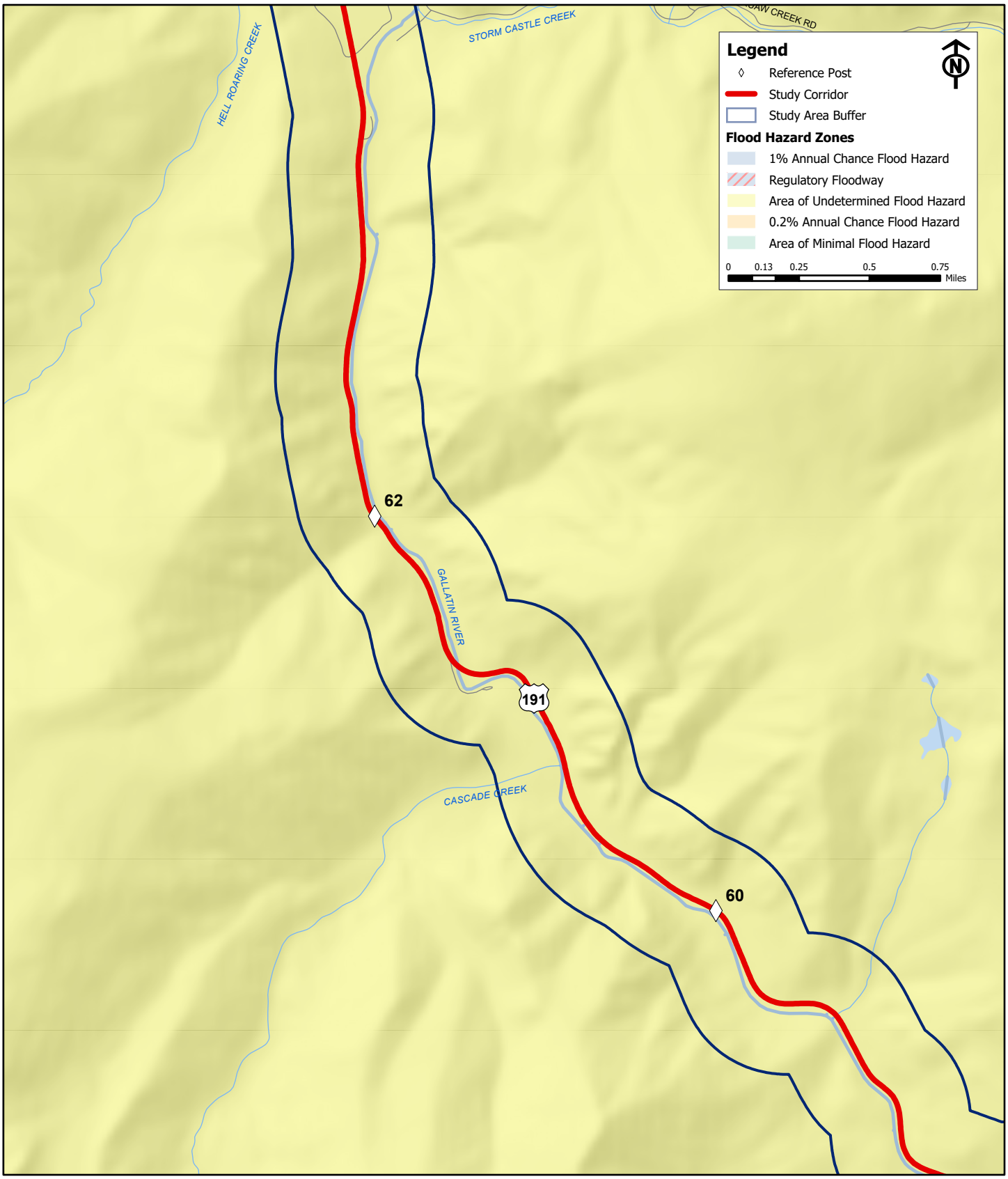



**Figure A.7: FEMA Floodplain Boundaries**

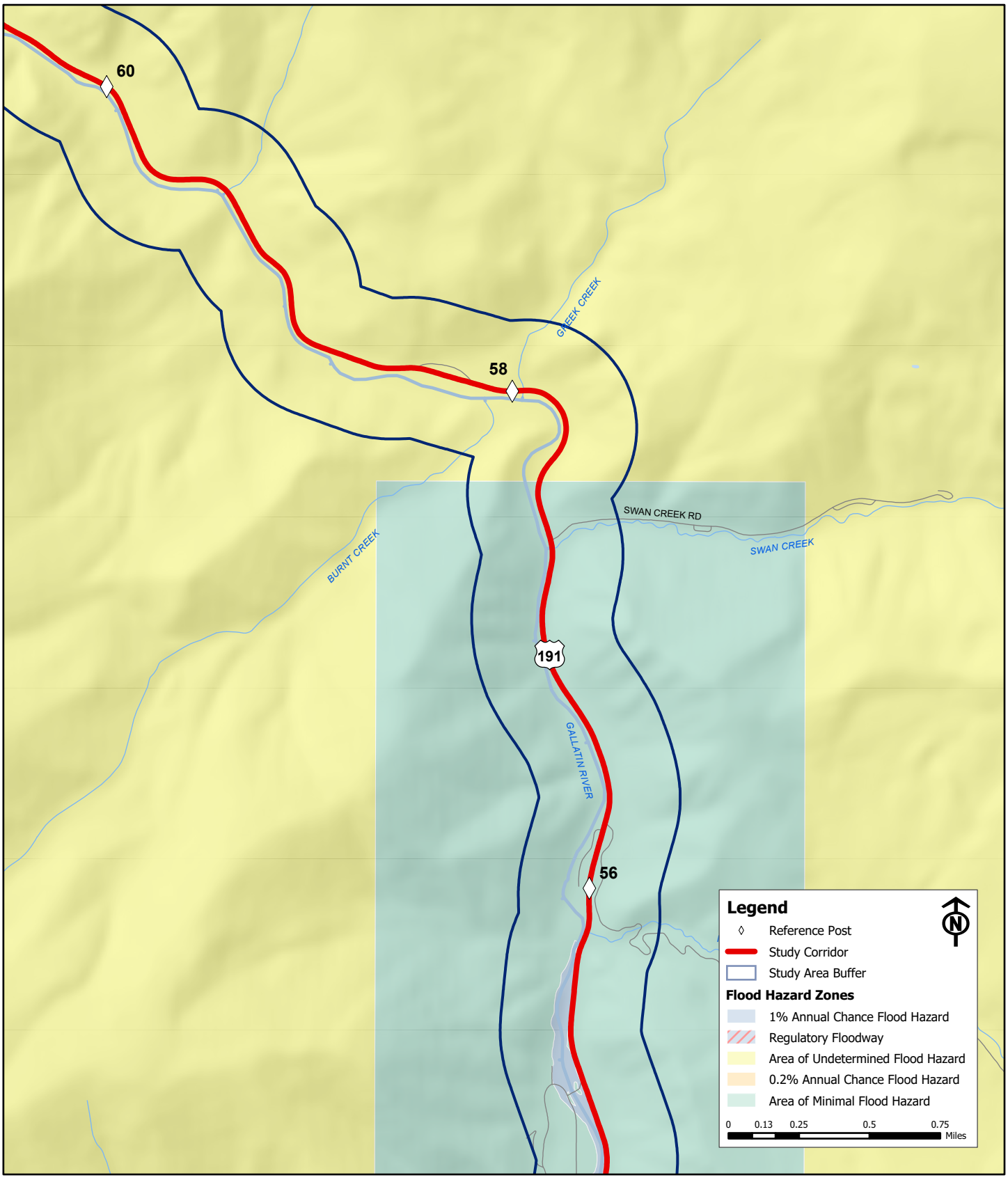





**Figure A.7: FEMA Floodplain Boundaries**

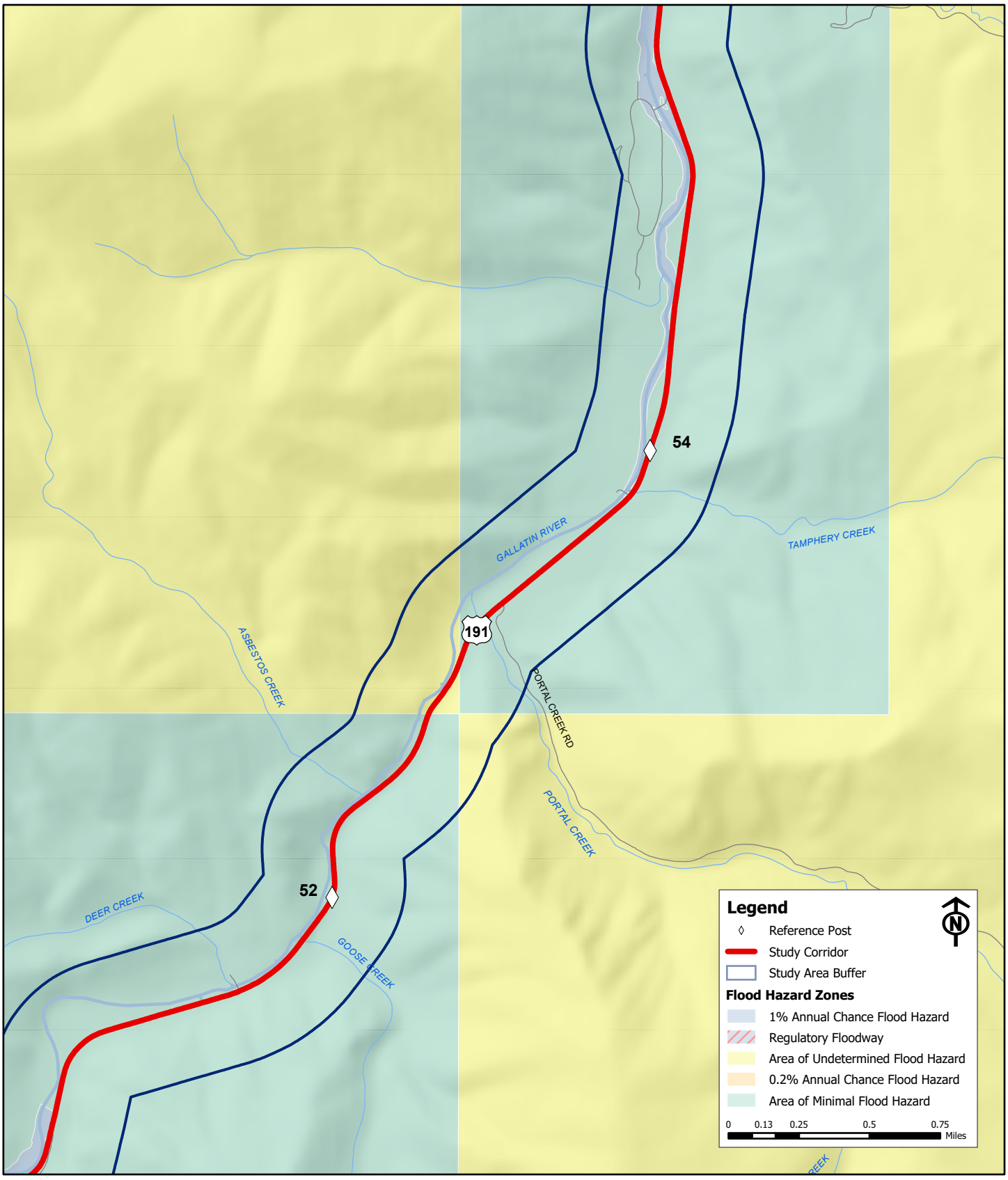





**Figure A.7: FEMA Floodplain Boundaries**

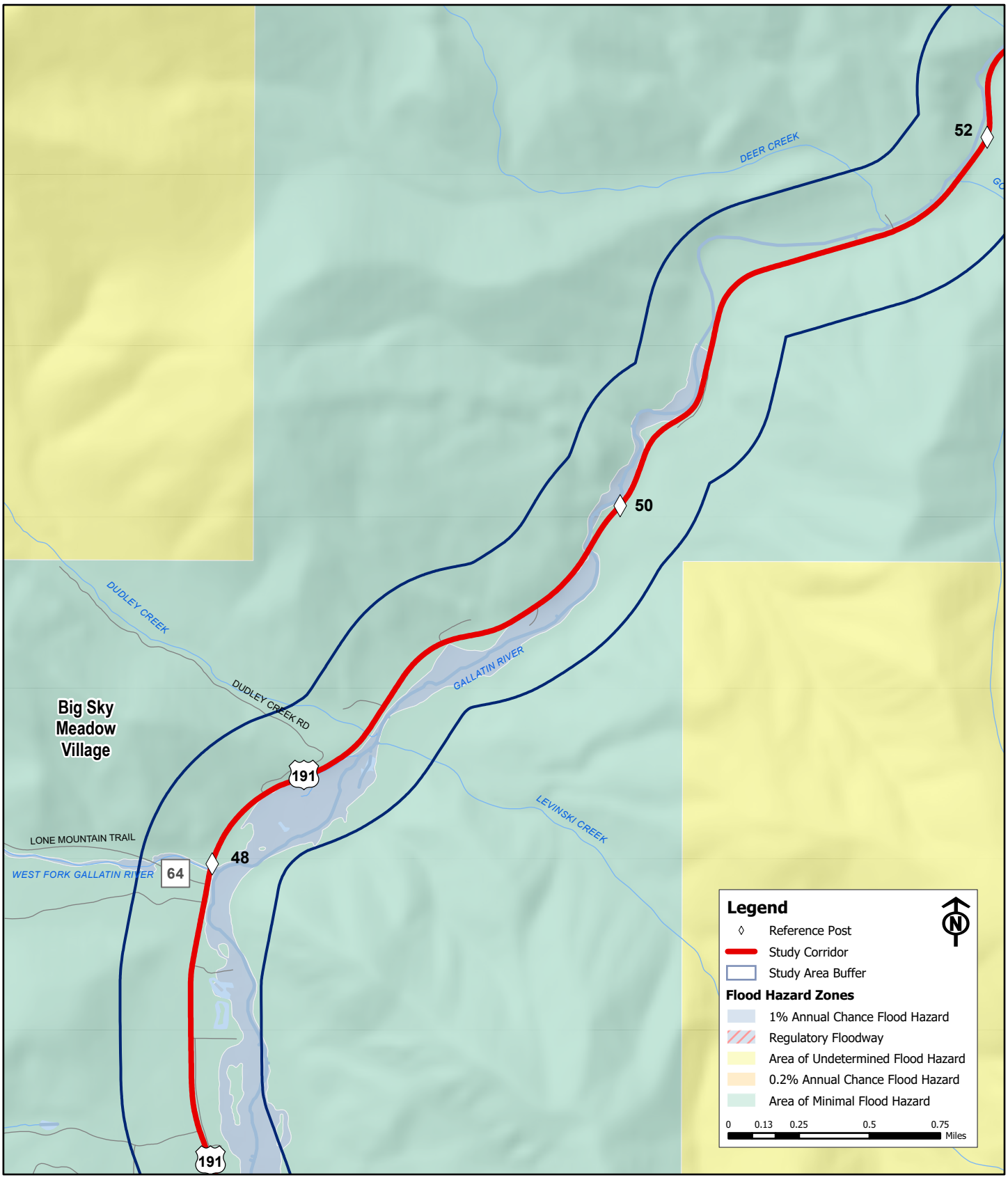



**Figure A.7: FEMA Floodplain Boundaries**

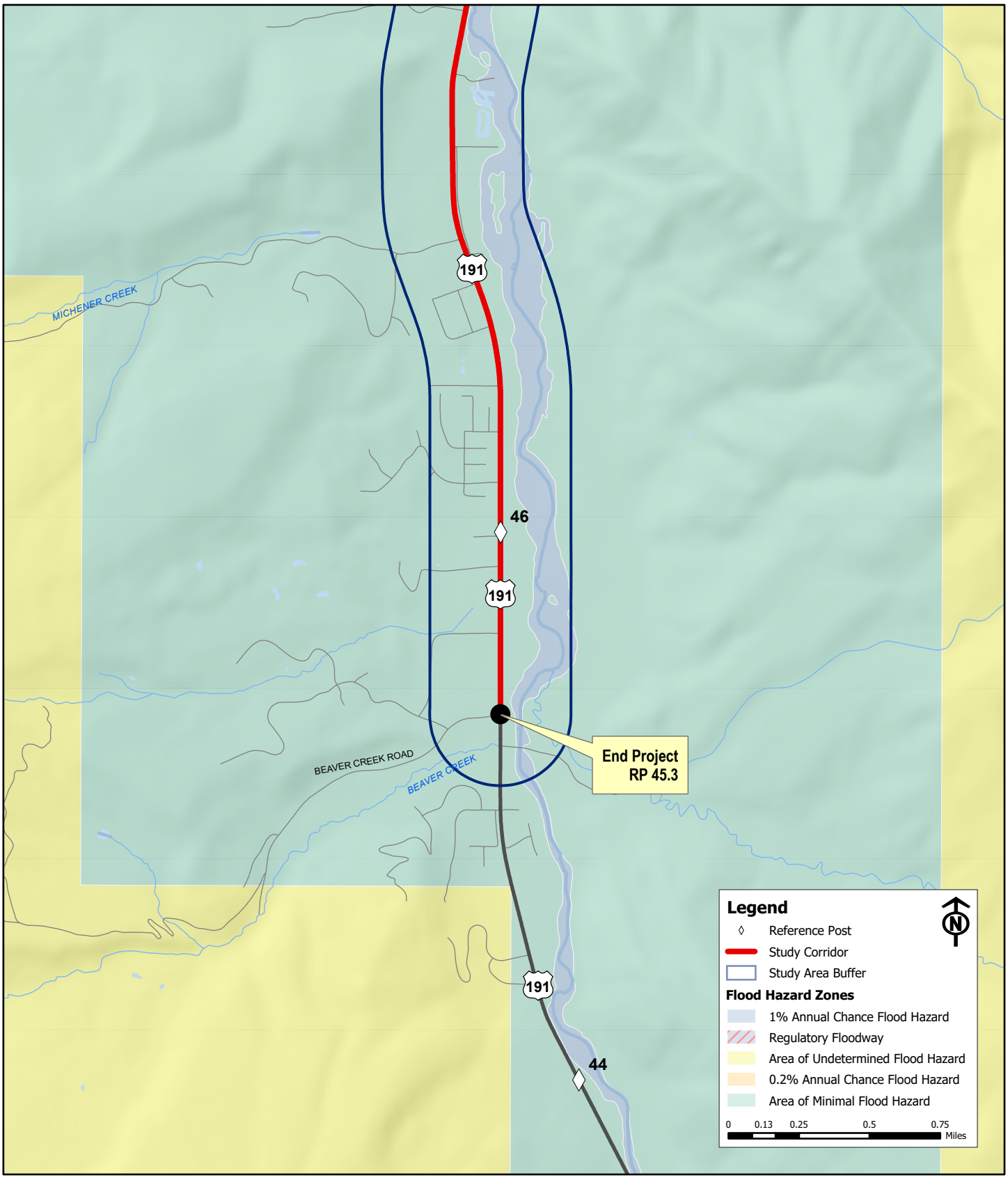





**Figure A.7: FEMA Floodplain Boundaries**

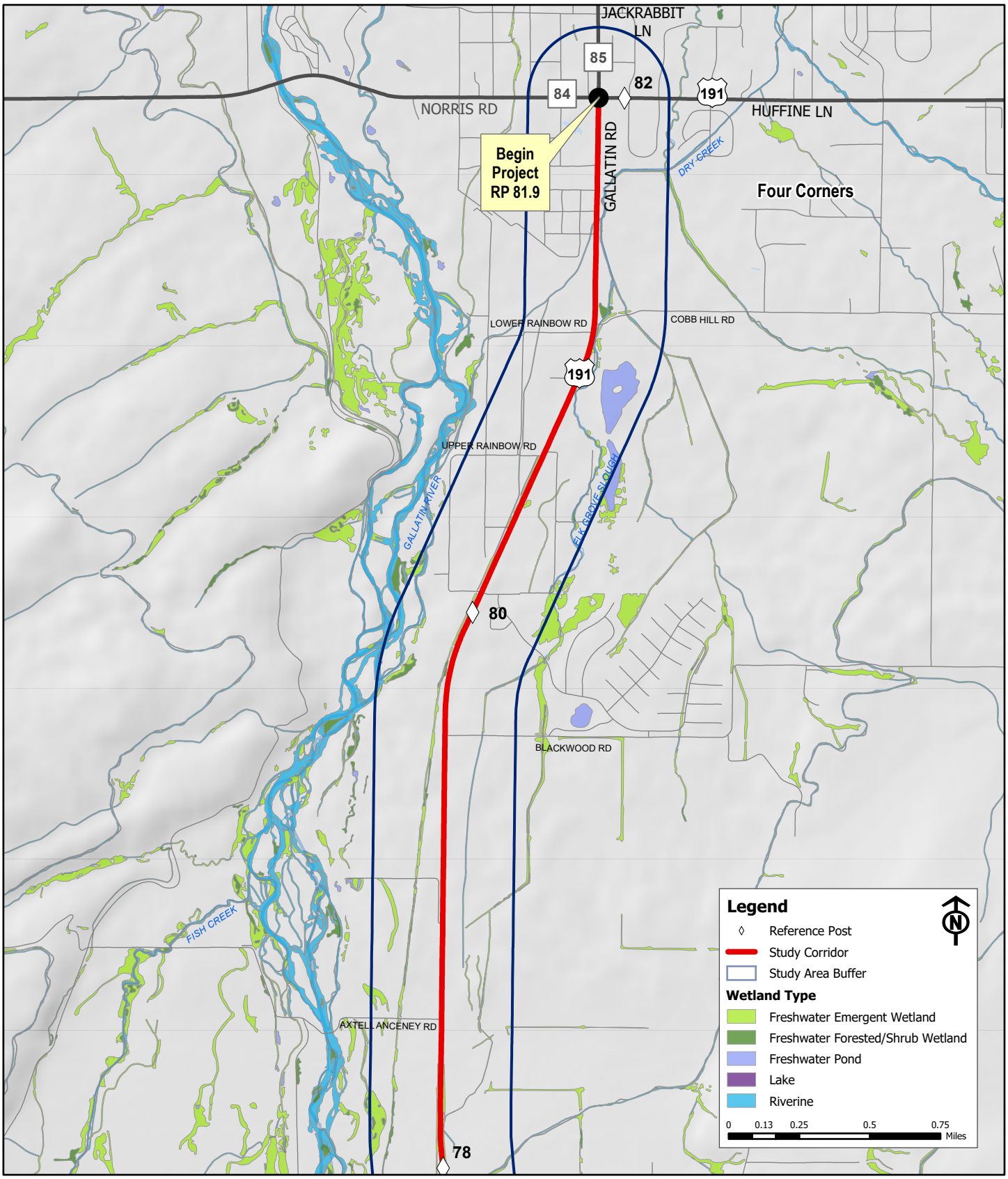





**Figure A.8: NWI Wetlands**

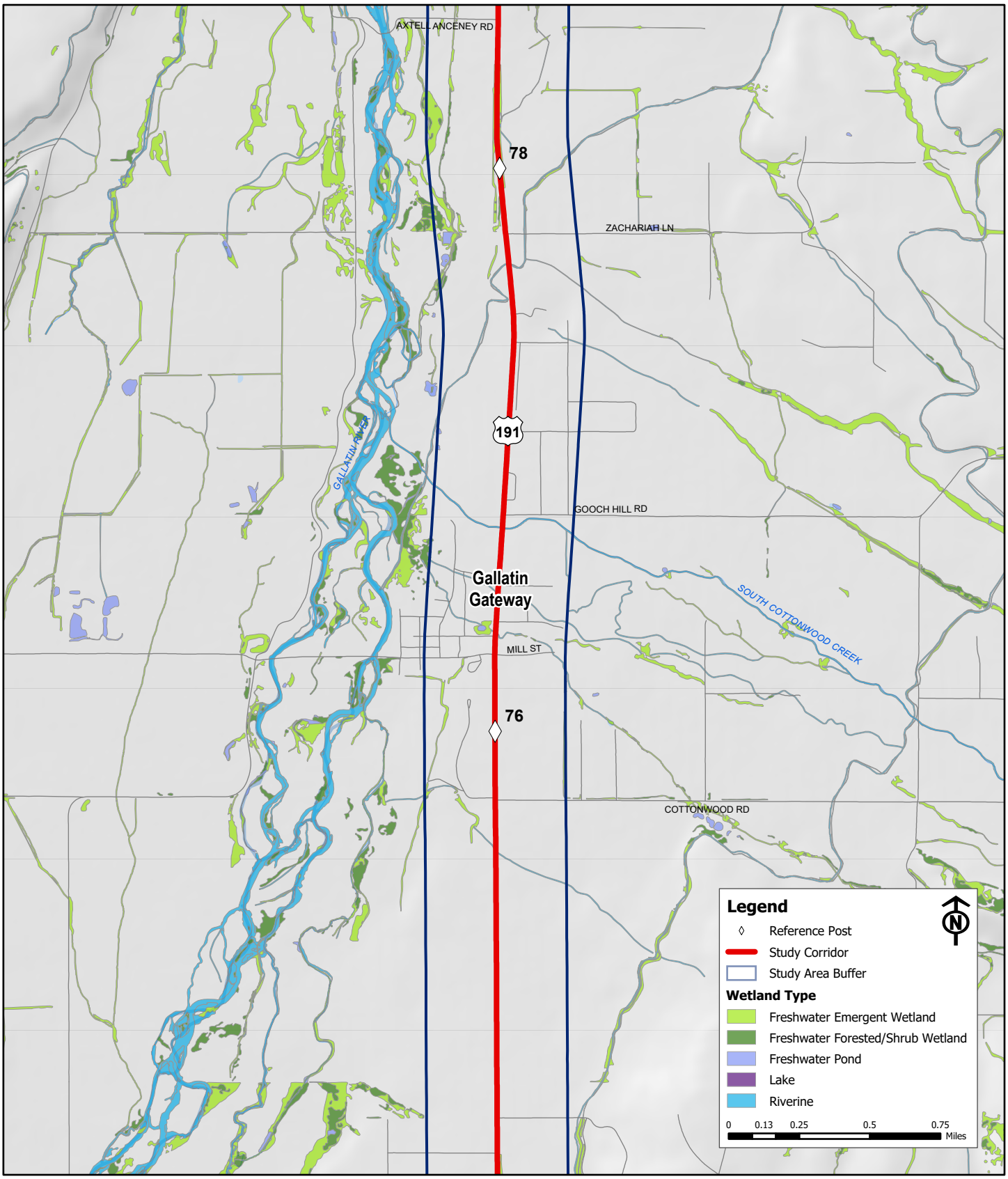





**Figure A.8: NWI Wetlands**

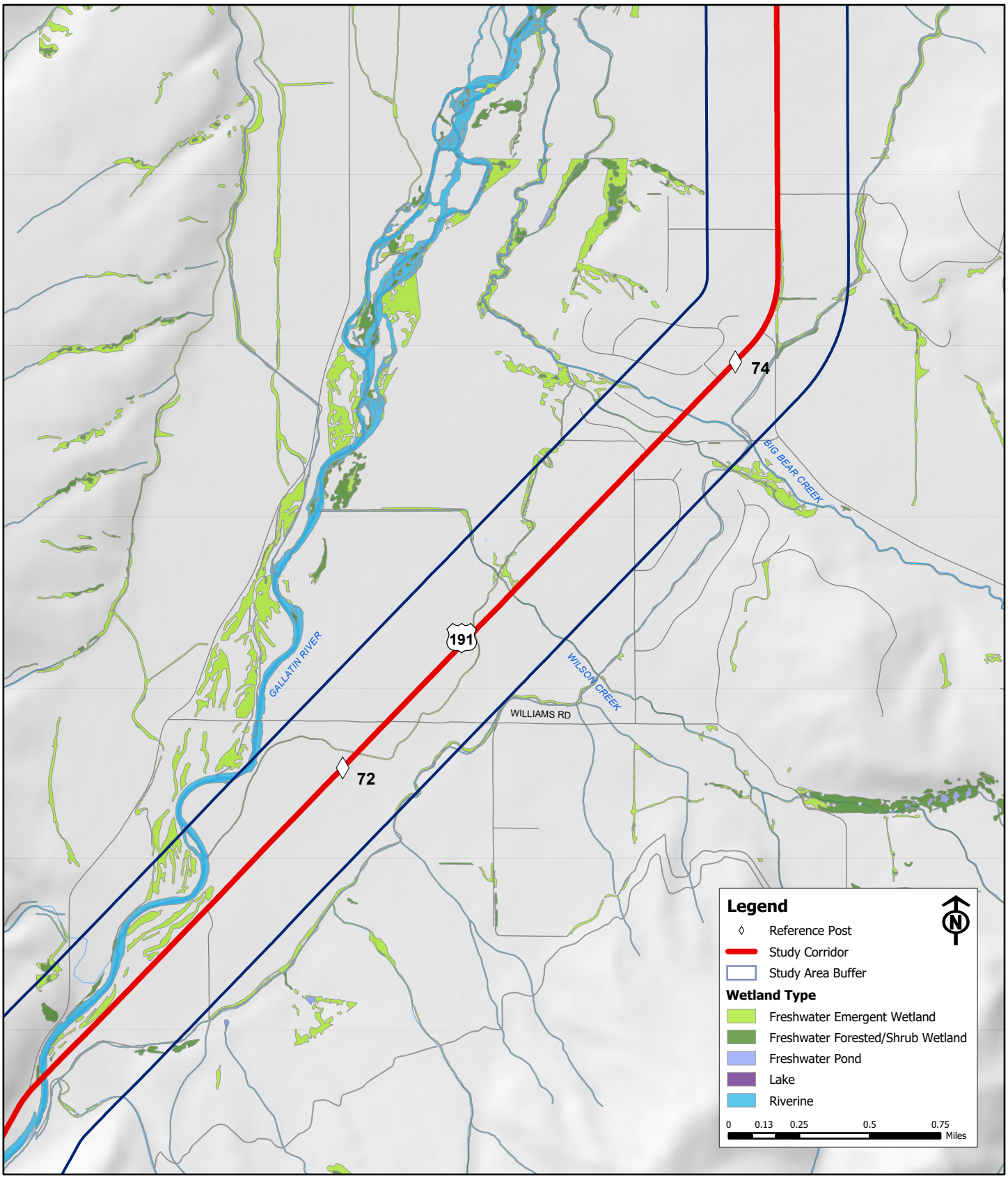





**Figure A.8: NWI Wetlands**

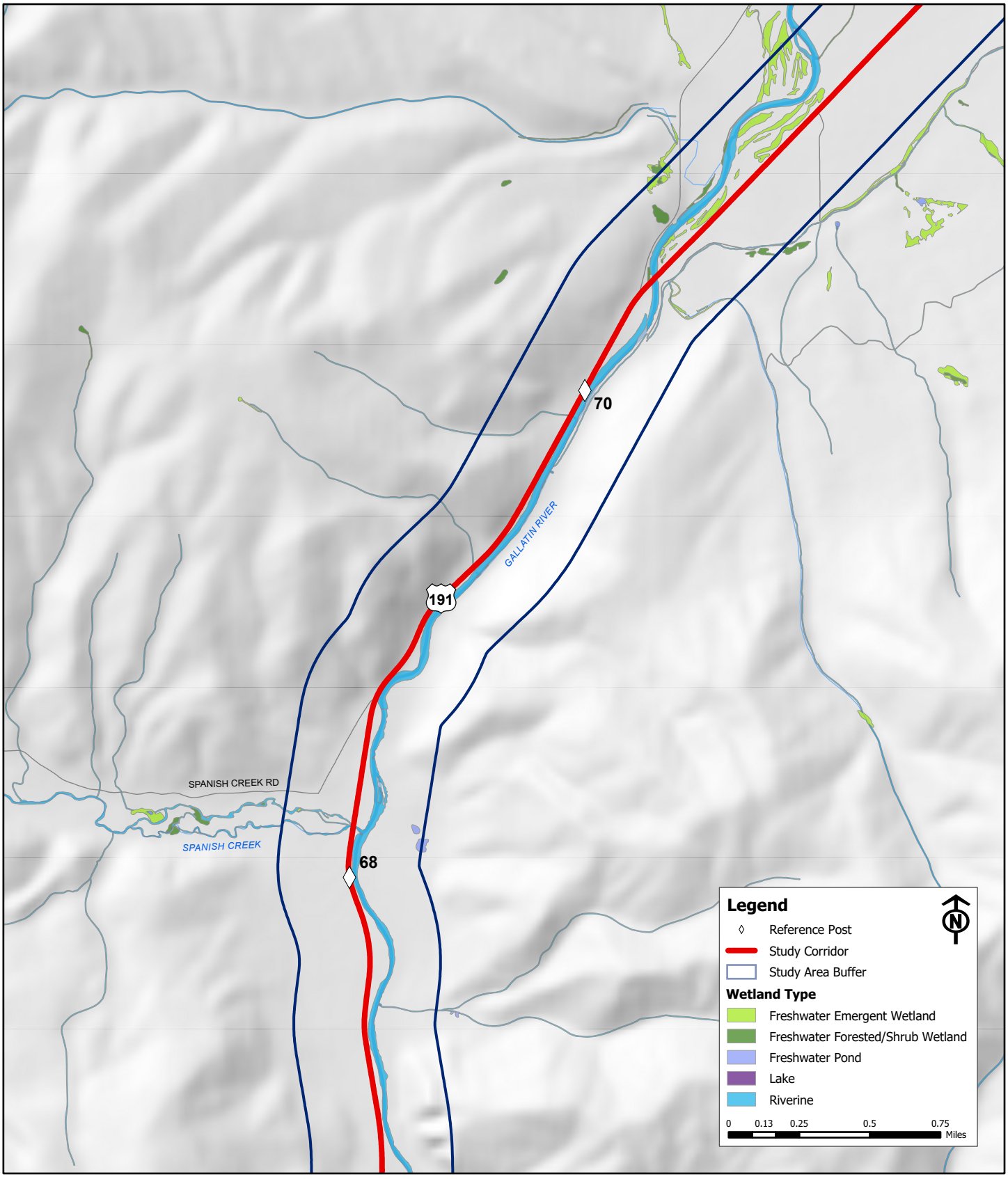





**Figure A.8: NWI Wetlands**

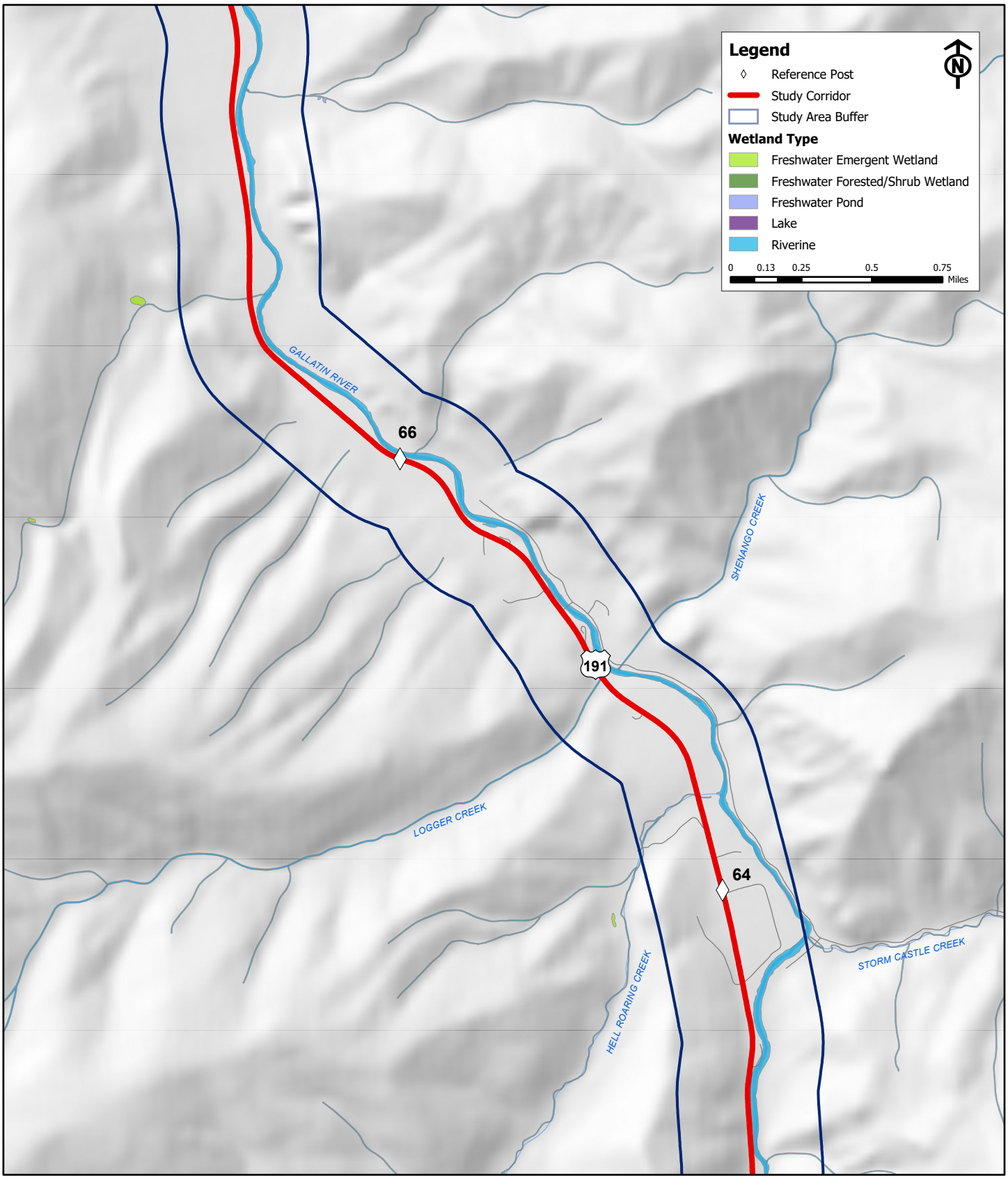





**Figure A.8: NWI Wetlands**

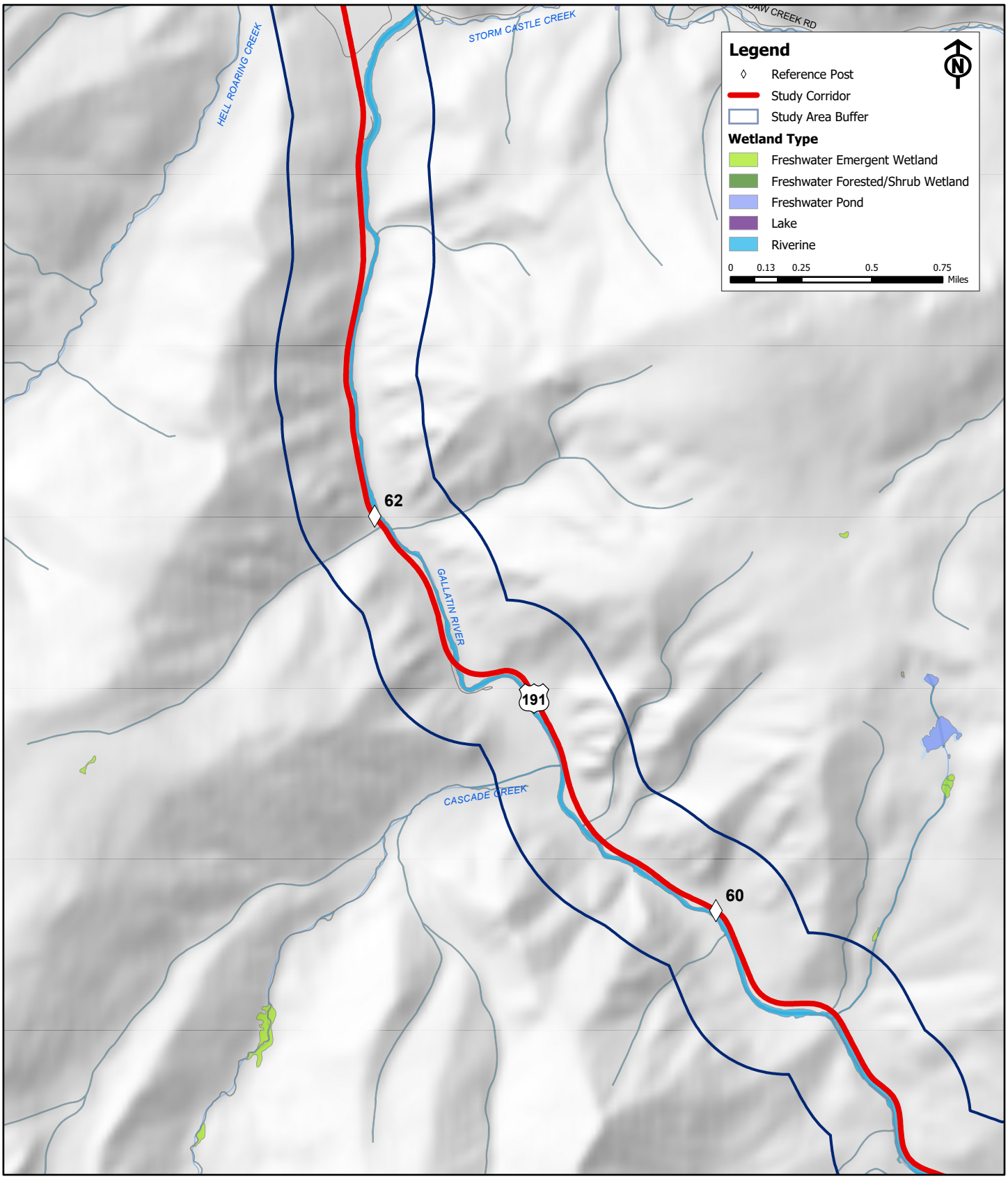





**Figure A.8: NWI Wetlands**

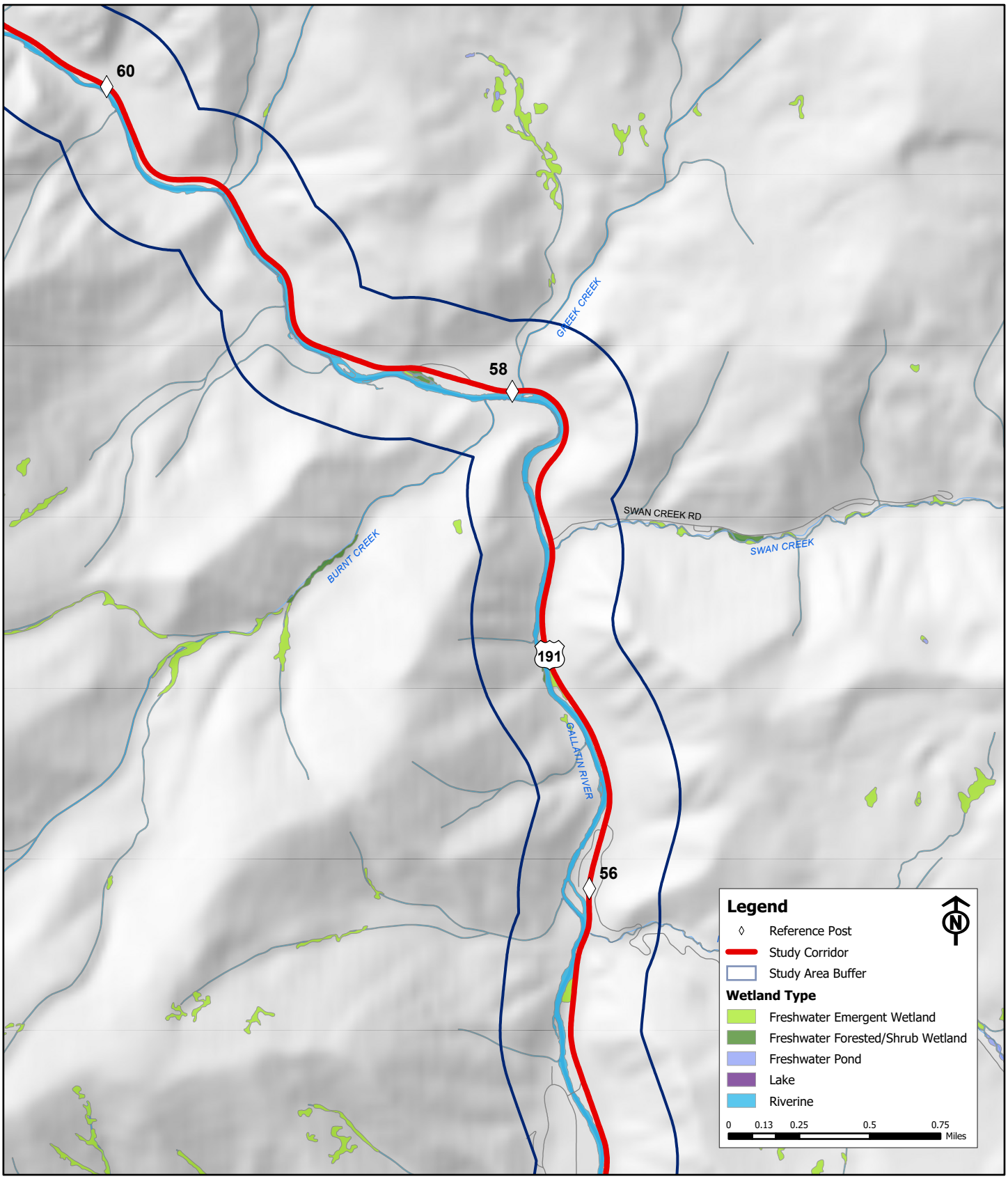
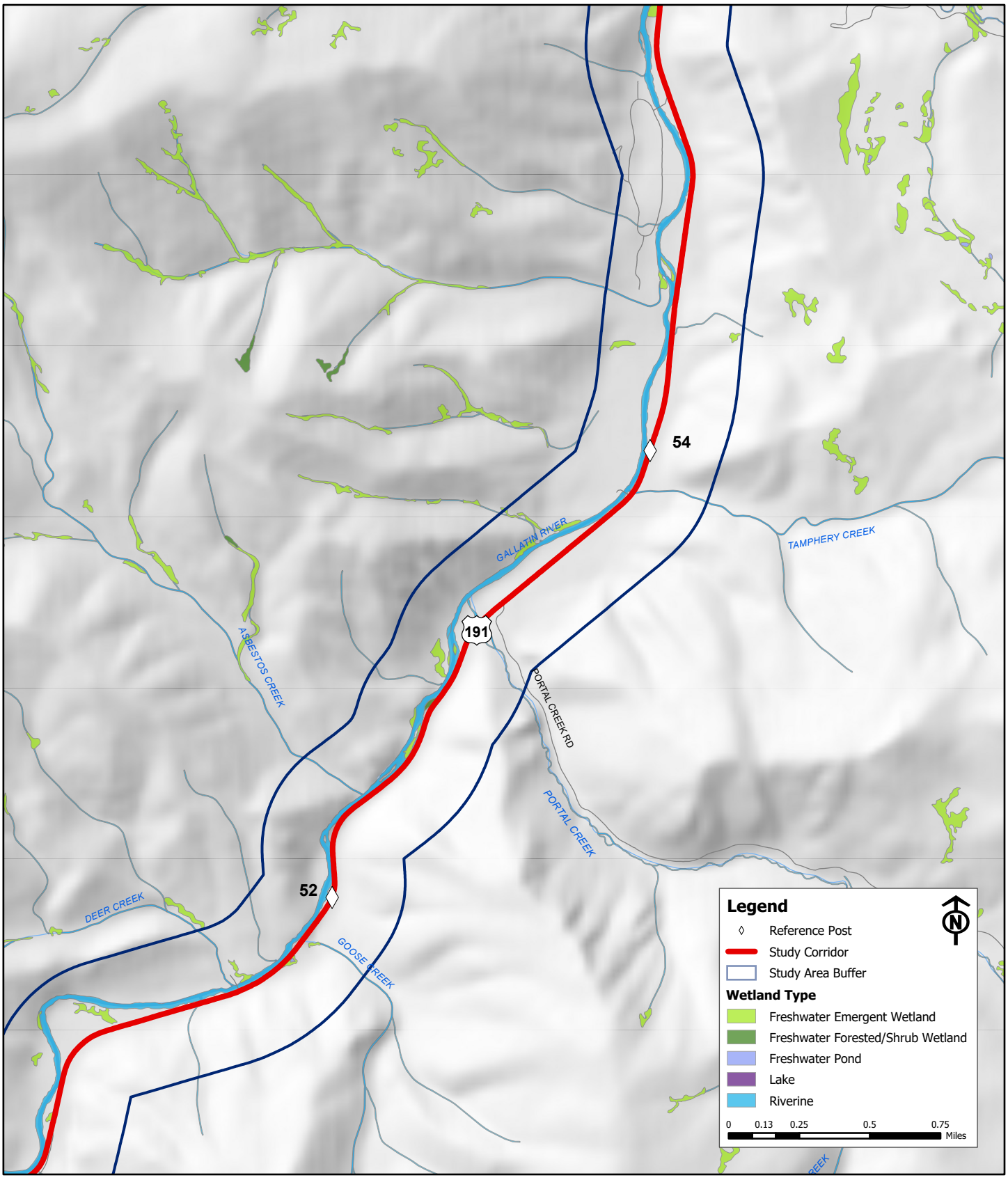
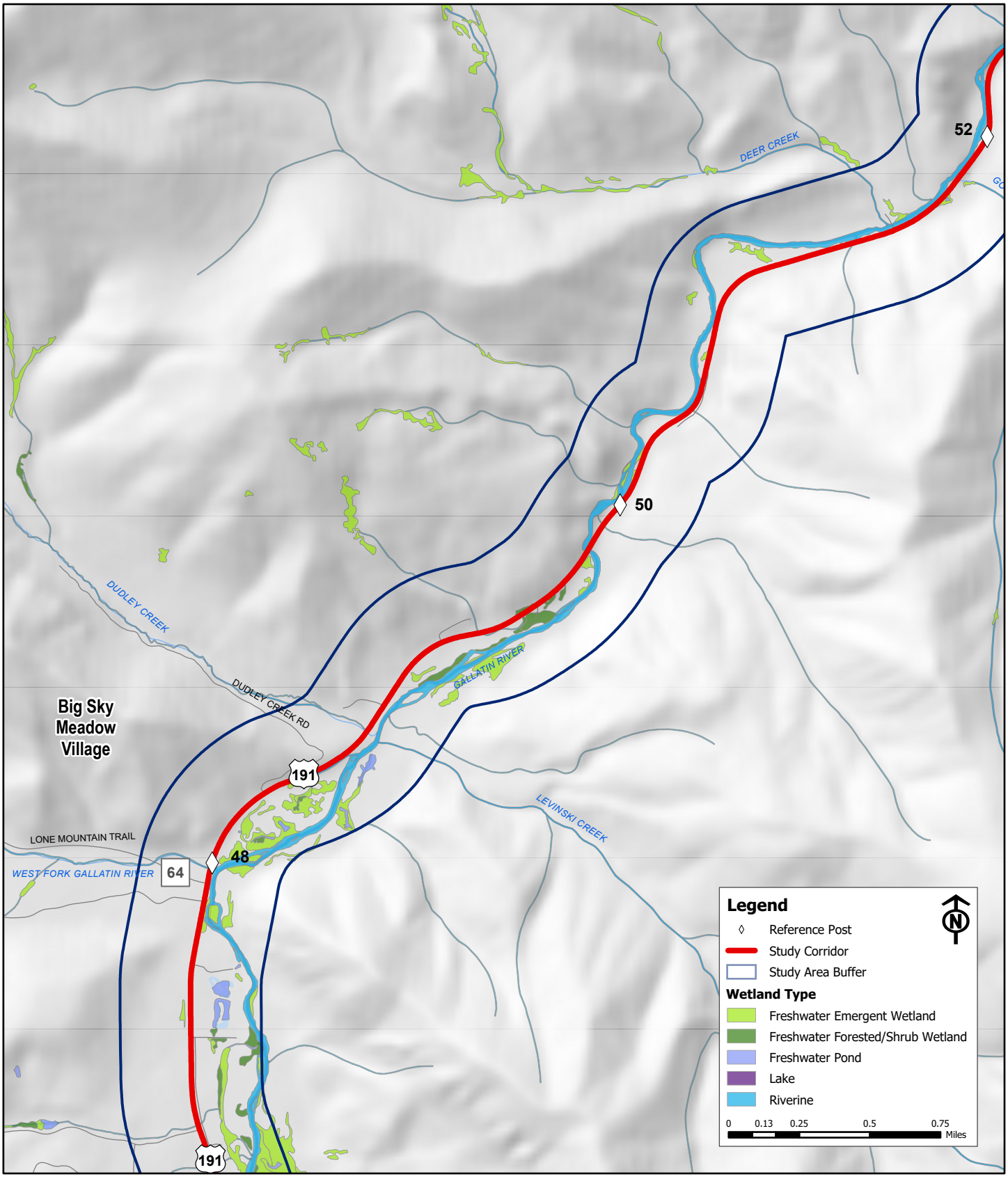





**Figure A.8: NWI Wetlands**


54
191
52
GALLATIN RIVER
TAMPHERY CREEK
ASBESTOS CREEK
PORTAL CREEK RD
PORTAL CREEK
DEER CREEK
GOOSE CREEK
Legend
Reference Post
Study Corridor
Study Area Buffer
Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine
0 0.13 0.25 0.5 0.75
Miles


52
DEER CREEK
50
DUDLEY CREEK
DUDLEY CREEK RD
GALLATIN RIVER
Big Sky
Meadow
Village
191
LEVINSKI CREEK
LONE MOUNTAIN TRAIL
48
WEST FORK GALLATIN RIVER
64
191
Legend
Reference Post
Study Corridor
Study Area Buffer
Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine
0
0.13
0.25
0.5
0.75
Miles
N

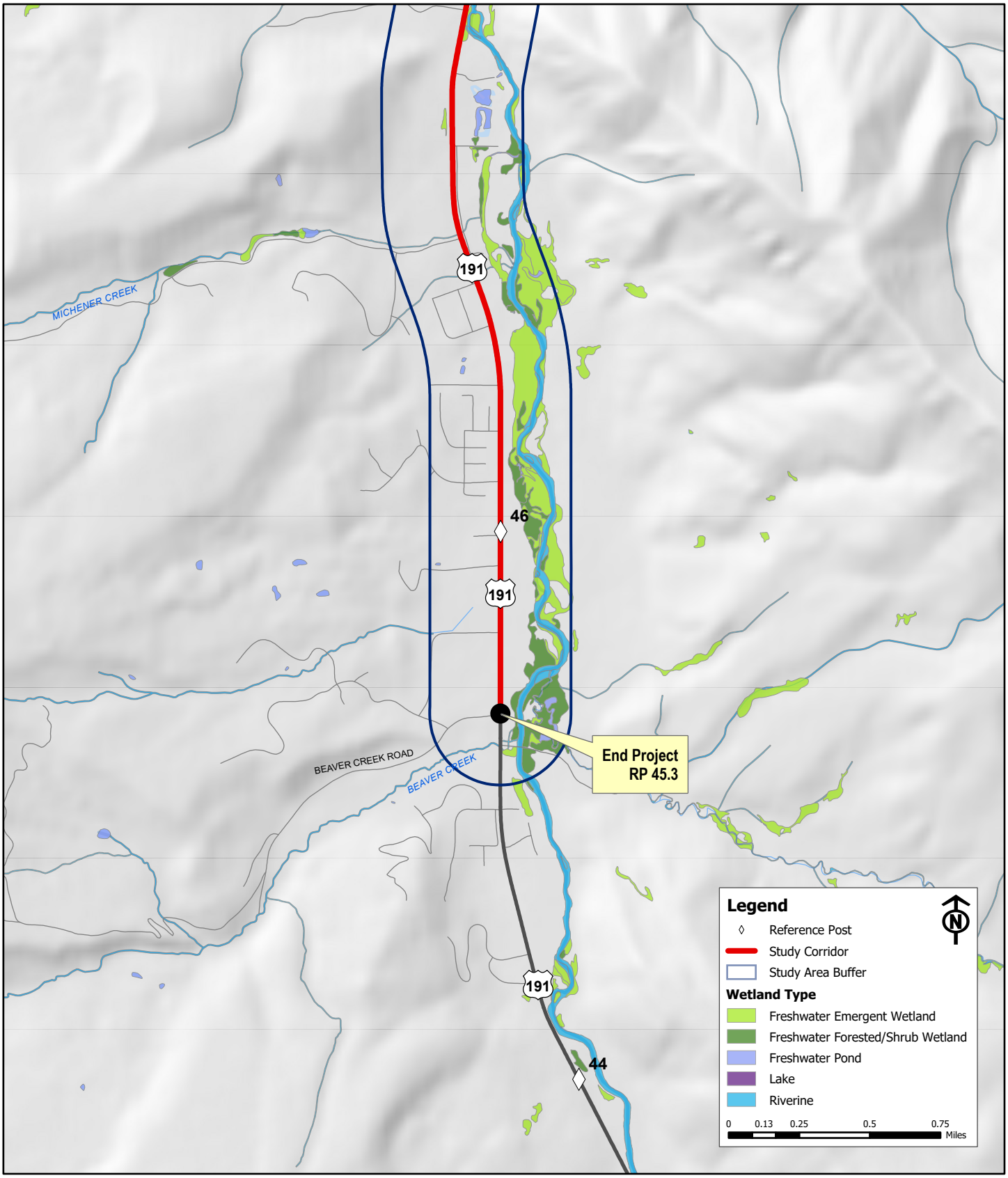





**Figure A.8: NWI Wetlands**

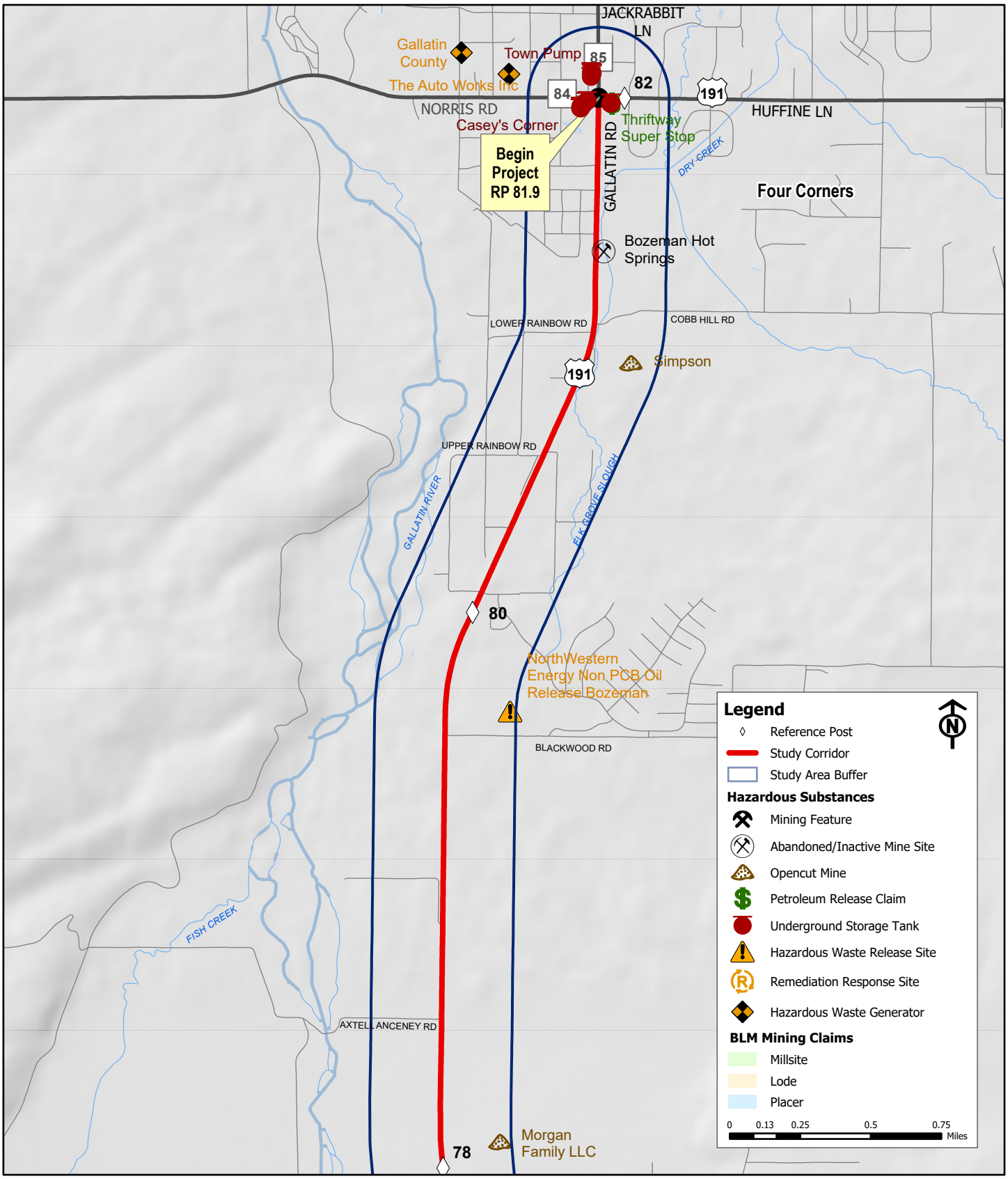
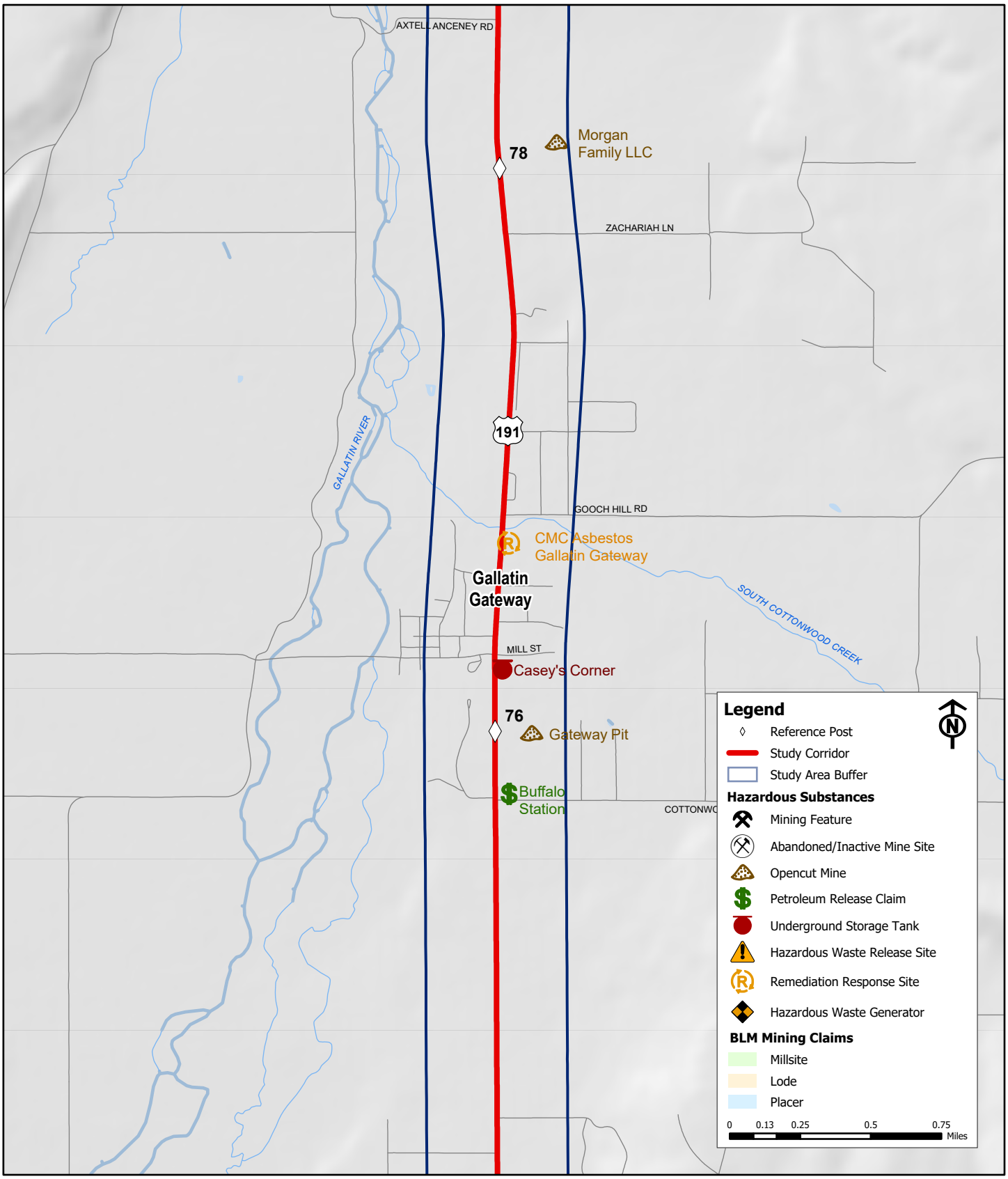





**Figure A.9: Hazardous Substances**


AXTELL ANCENEY RD
78
Morgan
Family LLC
ZACHARIAH LN
191
GALLATIN RIVER
GOOCH HILL RD
CMC Asbestos
Gallatin Gateway
Gallatin
Gateway
SOUTH COTTONWOOD CREEK
MILL ST
Casey's Corner
76
Gateway Pit
Buffalo
Station
COTTONWO
Legend
Reference Post
Study Corridor
Study Area Buffer
Hazardous Substances
Mining Feature
Abandoned/Inactive Mine Site
Opencut Mine
Petroleum Release Claim
Underground Storage Tank
Hazardous Waste Release Site
Remediation Response Site
Hazardous Waste Generator
BLM Mining Claims
Millsite
Lode
Placer
0 0.13 0.25 0.5 0.75
Miles

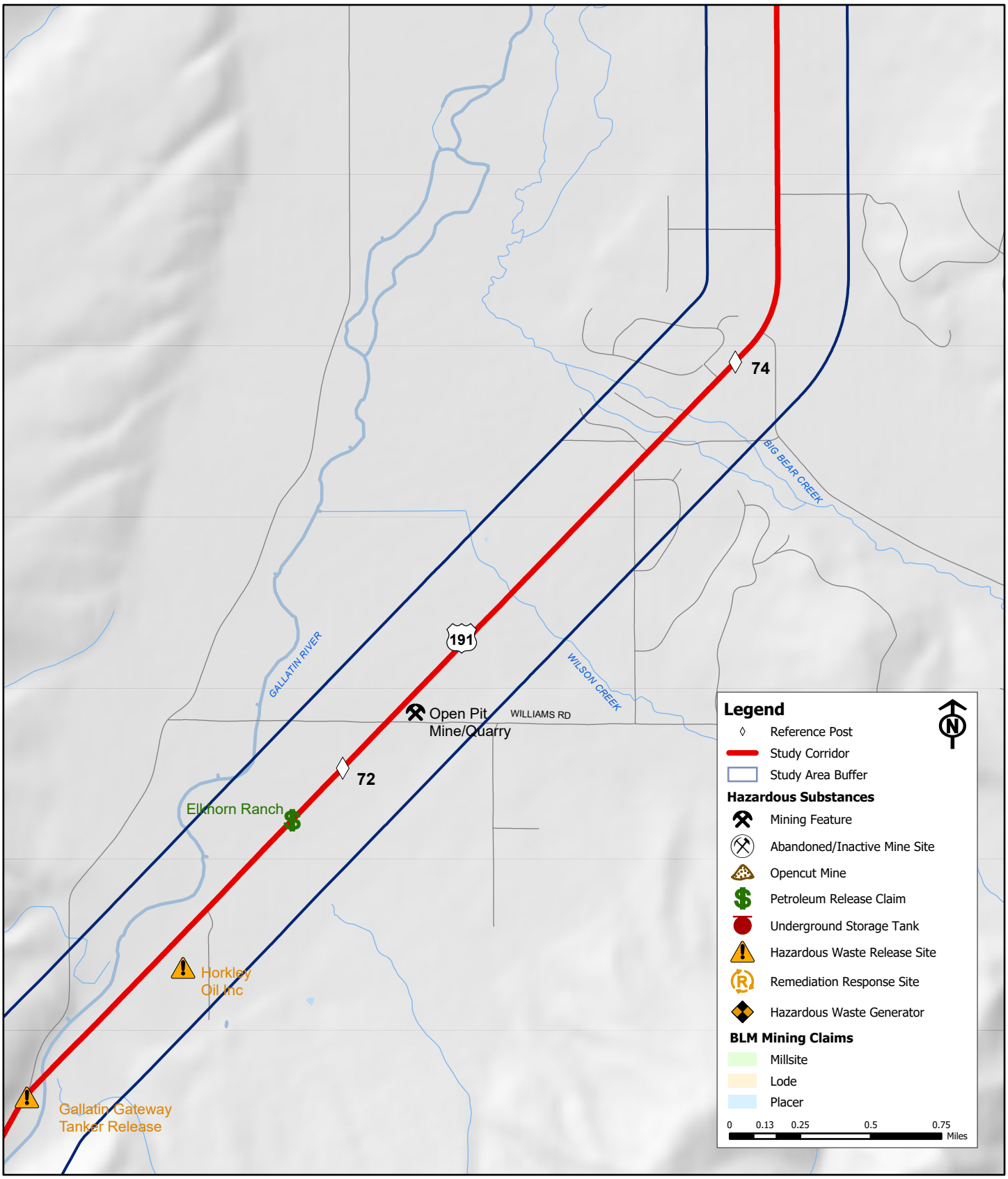





**Figure A.9: Hazardous Substances**

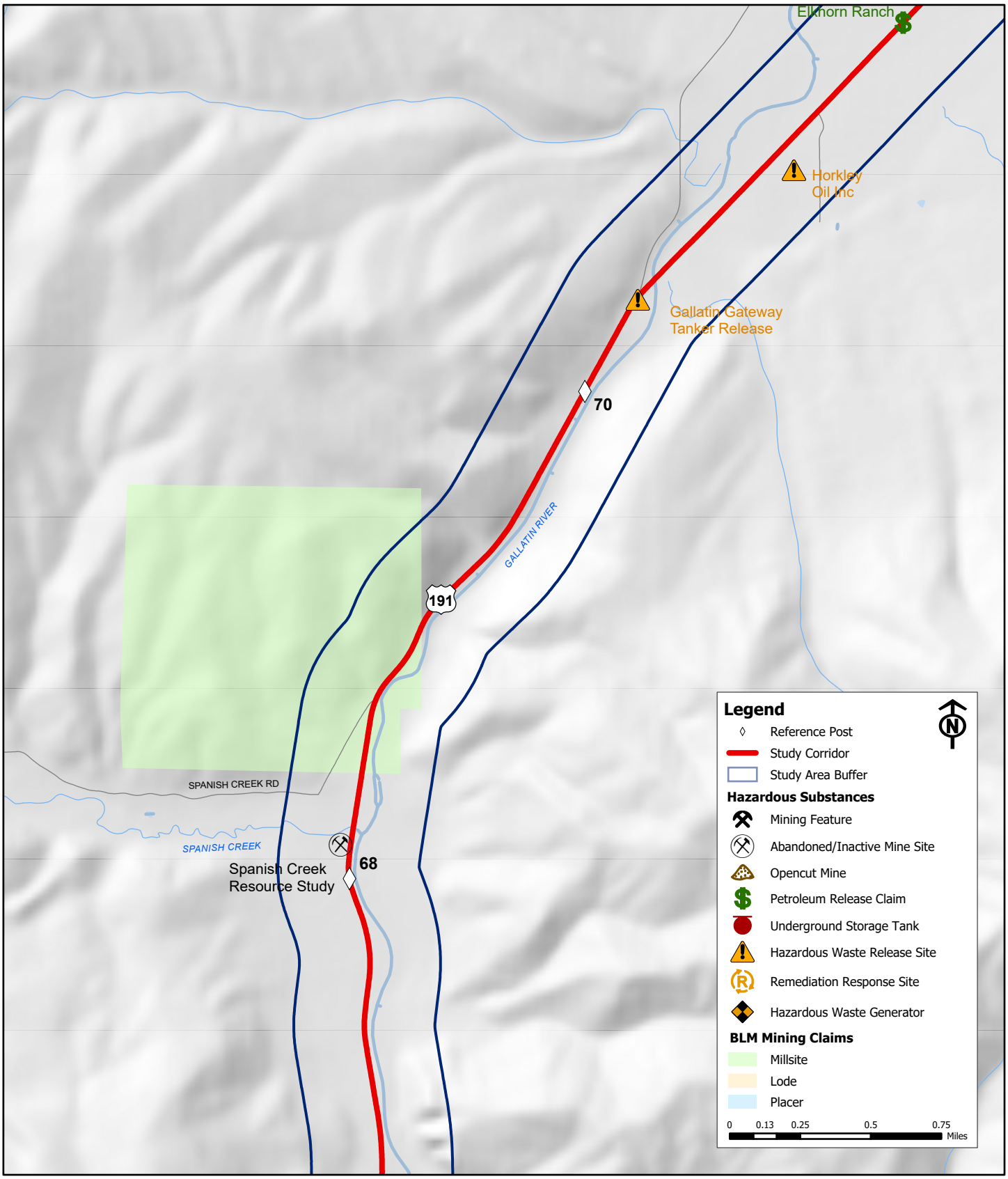





**Figure A.9: Hazardous Substances**

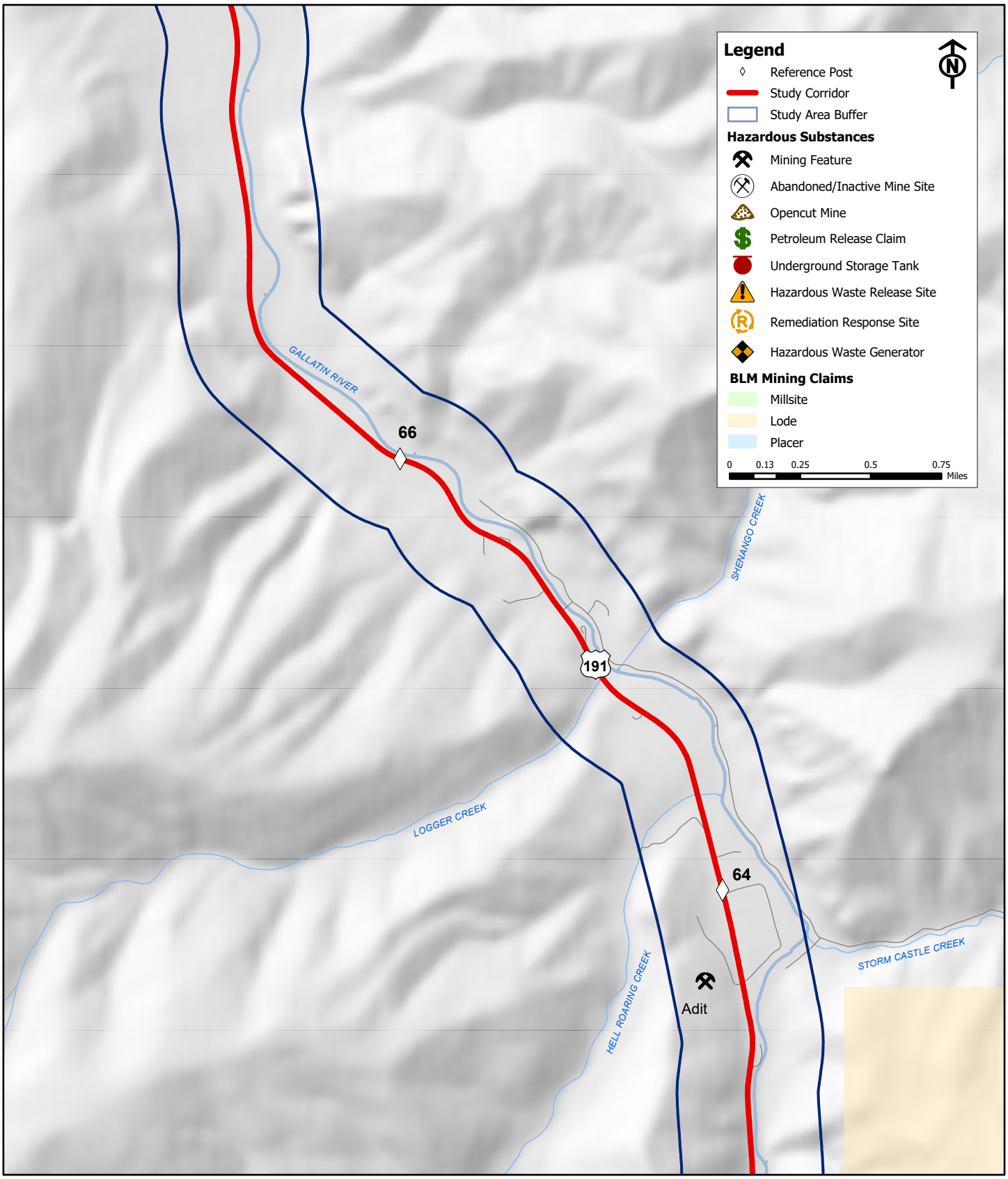





**Figure A.9: Hazardous Substances**

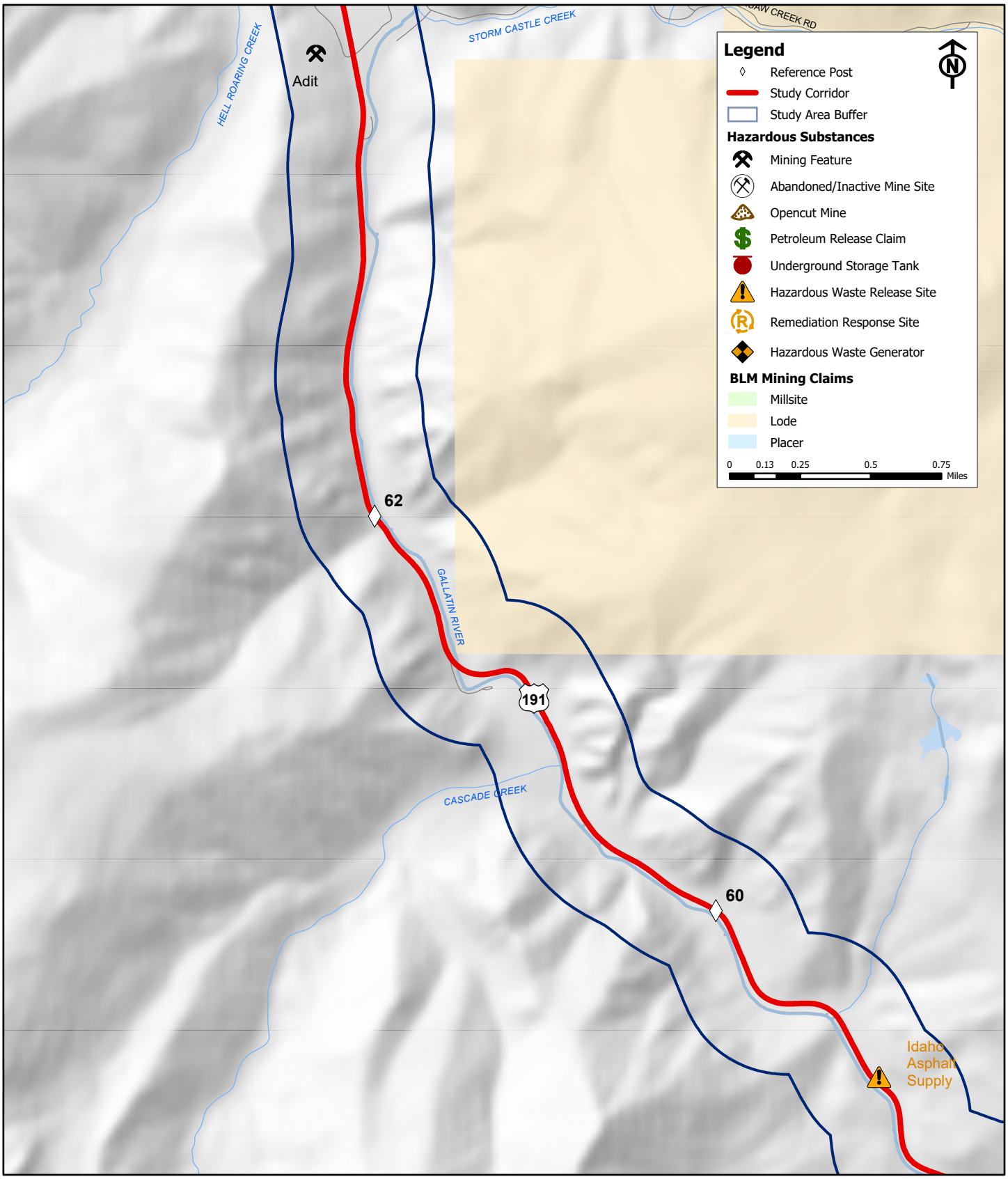



**Figure A.9: Hazardous Substances**

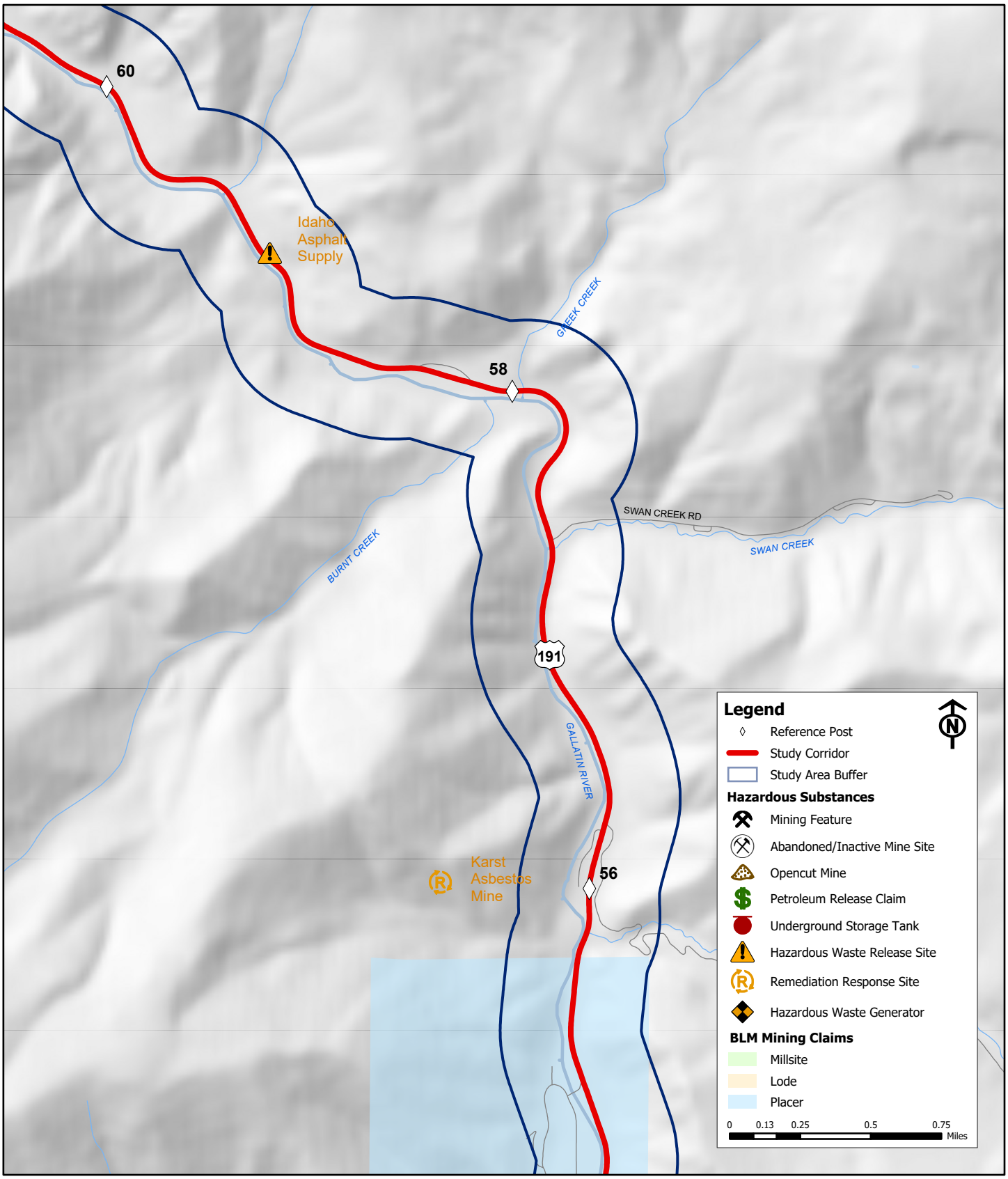



**Figure A.9: Hazardous Substances**

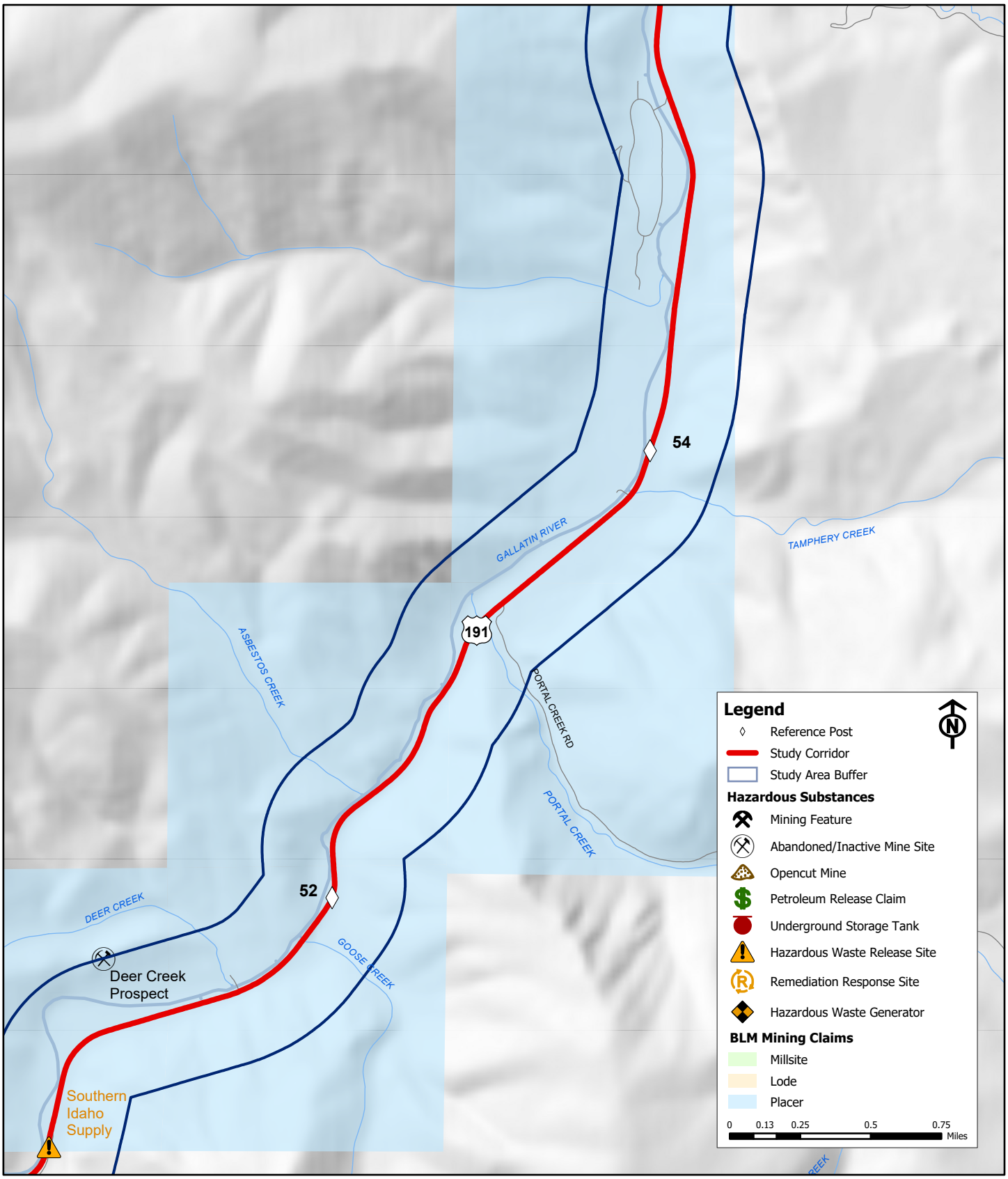





**Figure A.9: Hazardous Substances**

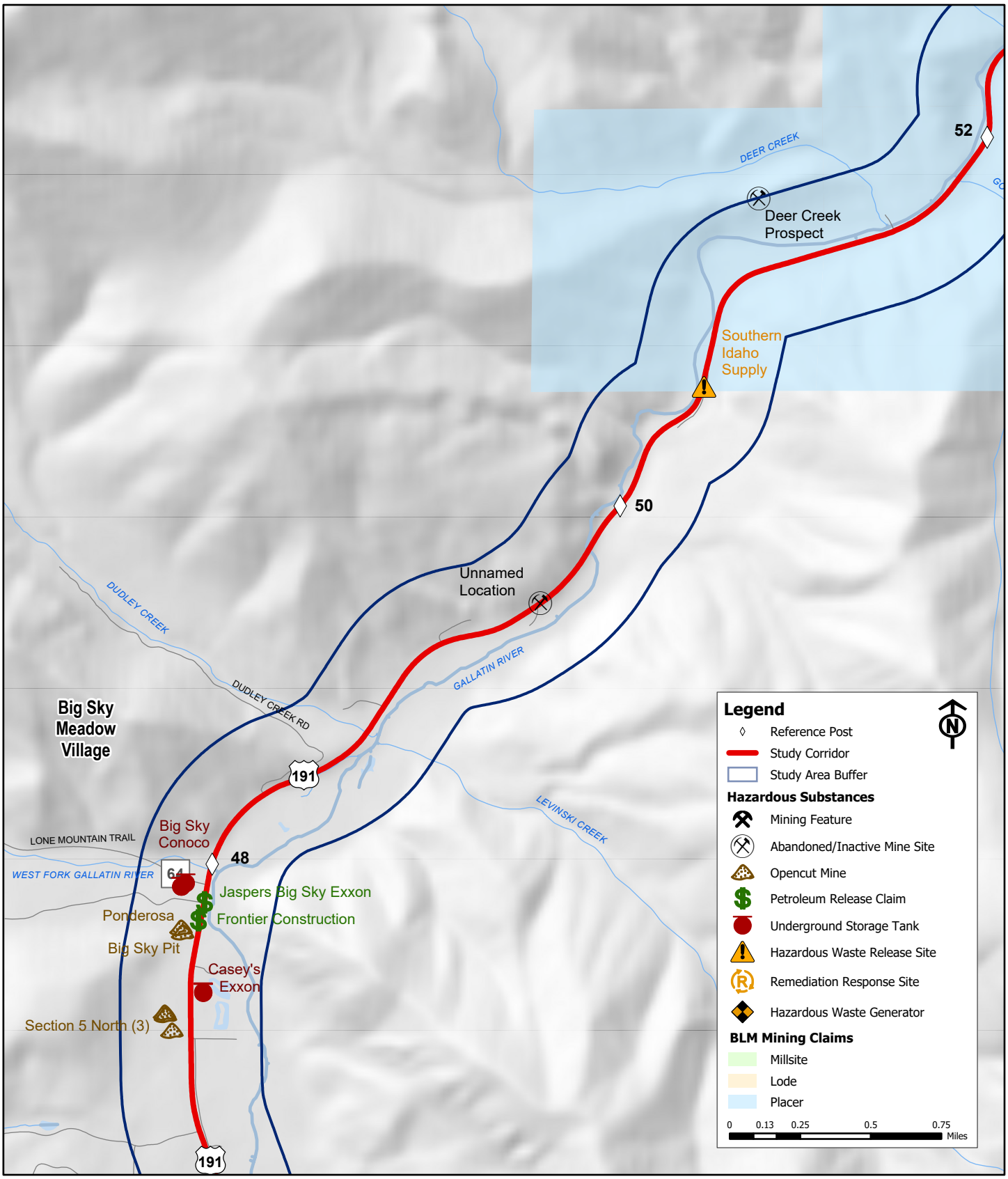





**Figure A.9: Hazardous Substances**

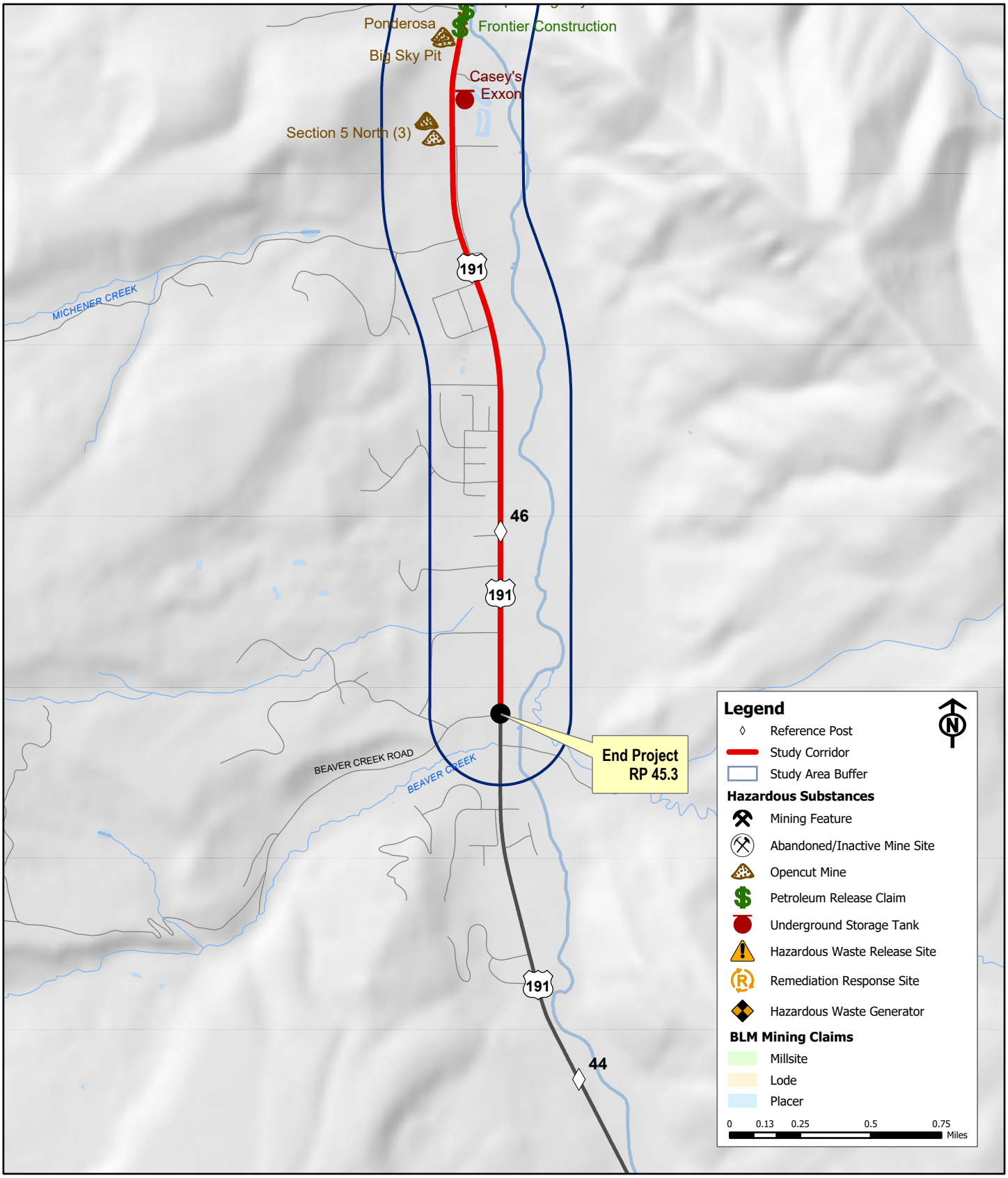





**Figure A.9: Hazardous Substances**

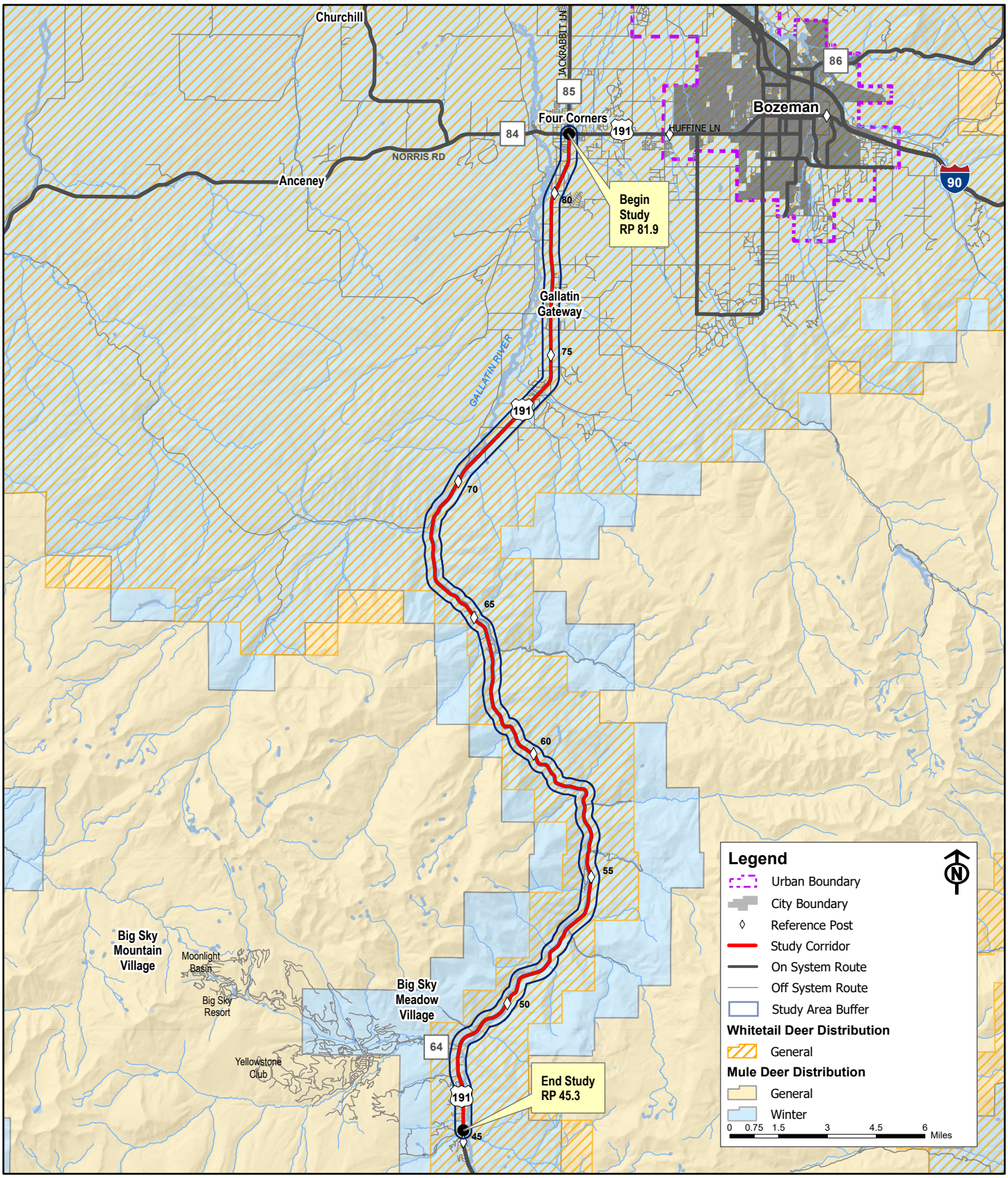





**Figure A.10: MFWP Mule and Whitetail Deer Distribution**

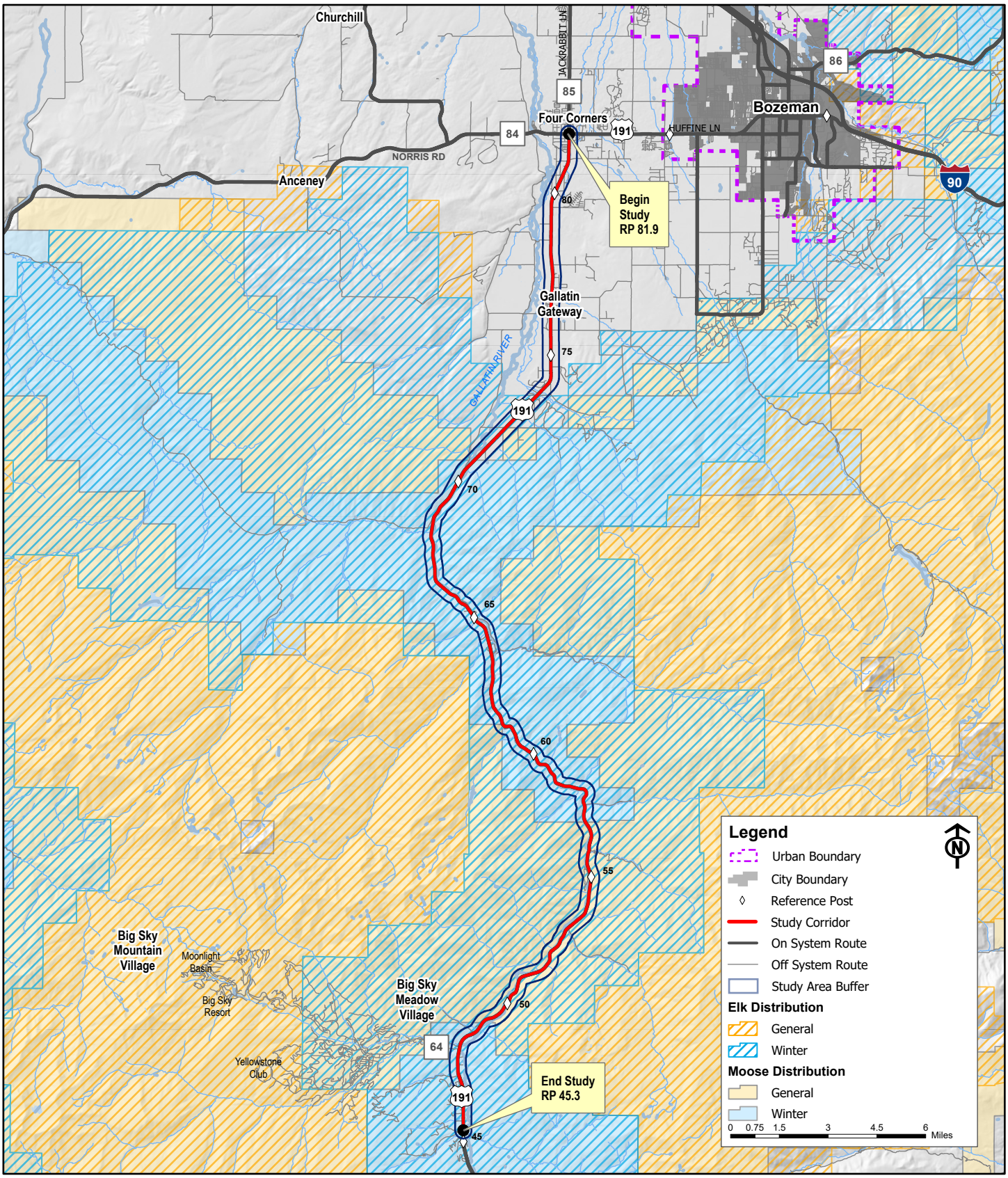



**Figure A.11: MFWP Moose and Elk Distribution**

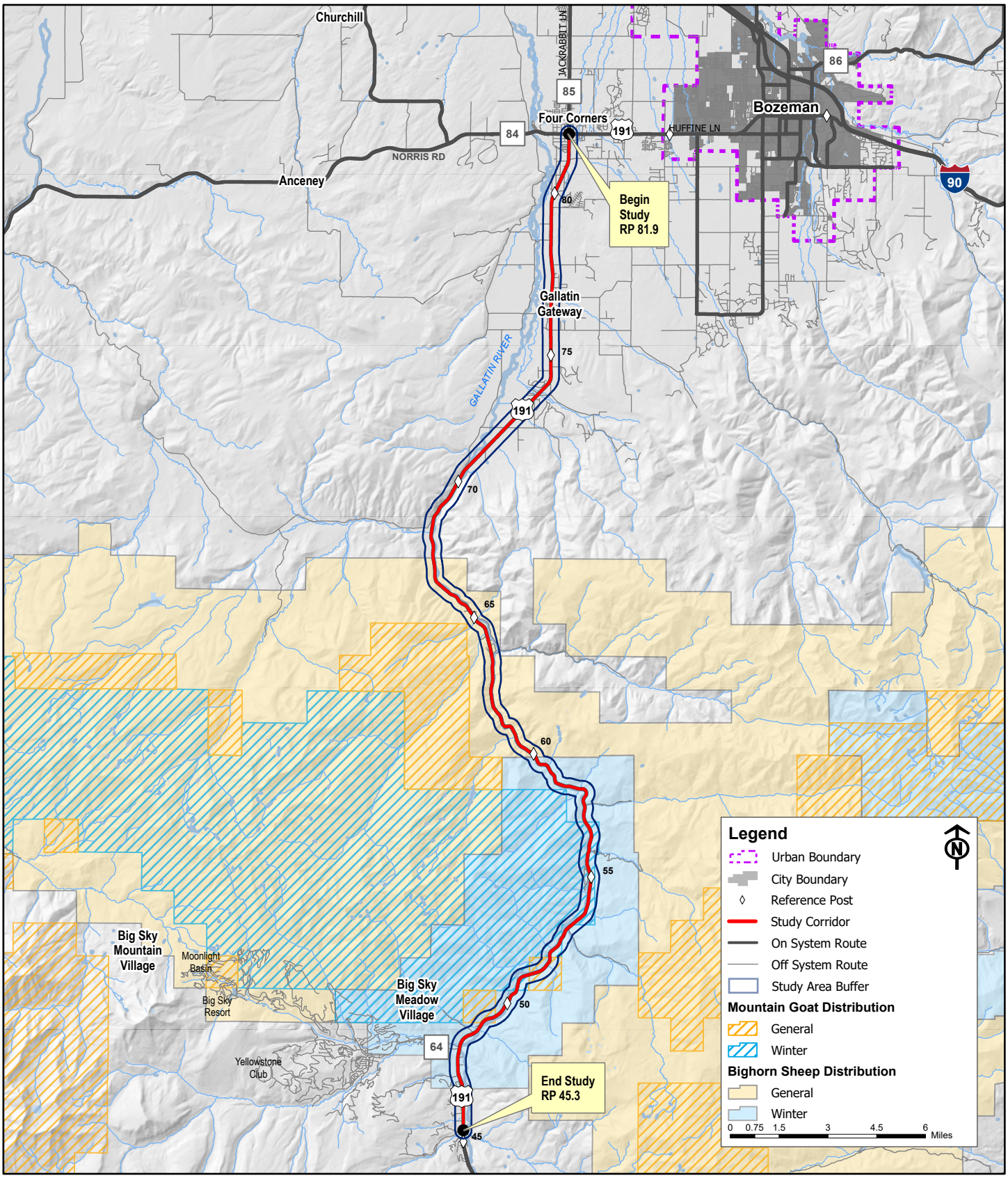





**Figure A.12: MFWP Bighorn Sheep and Mountain Goat Distribution**

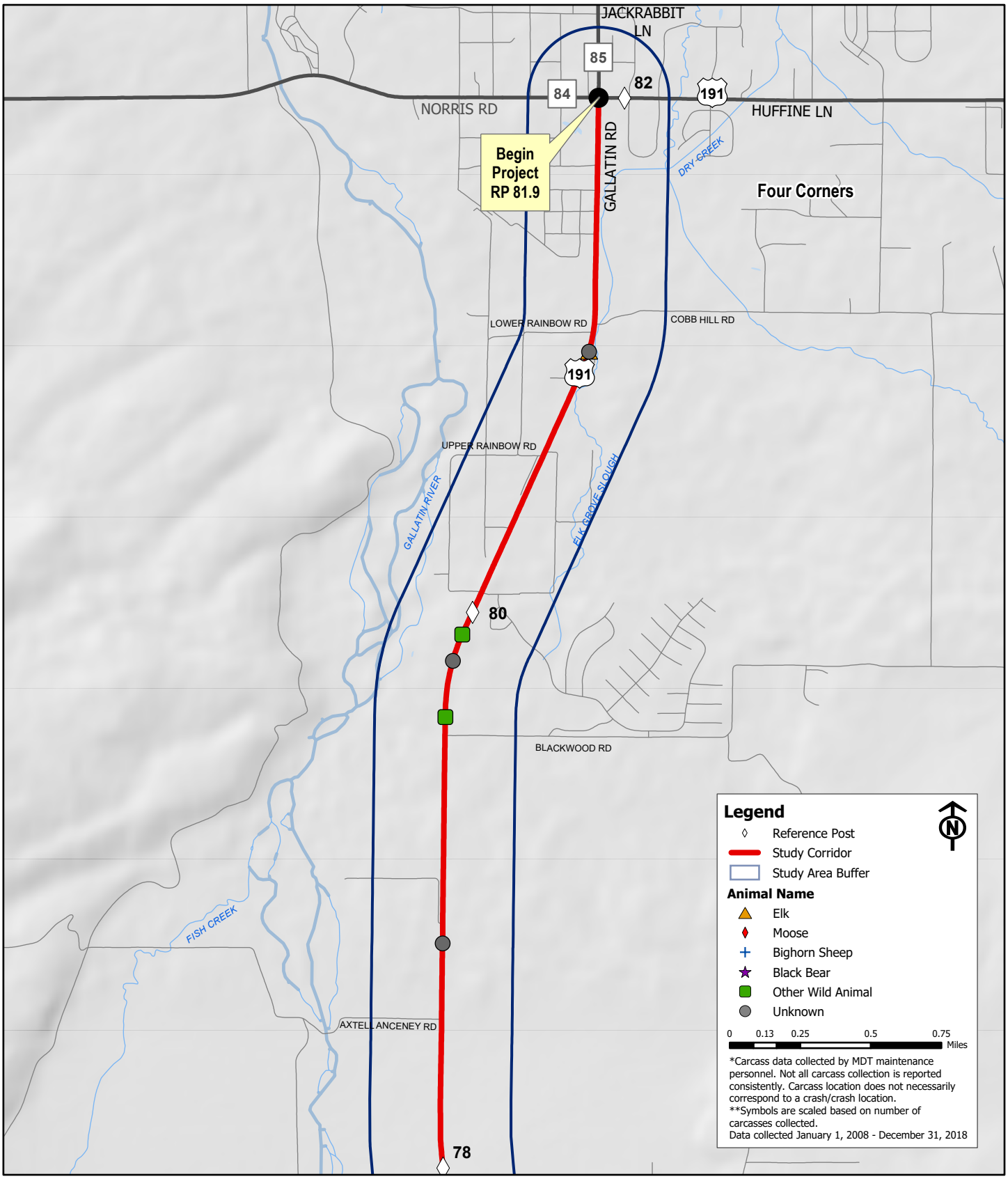



**Figure A.13: Large Mammal Animal Carcasses**

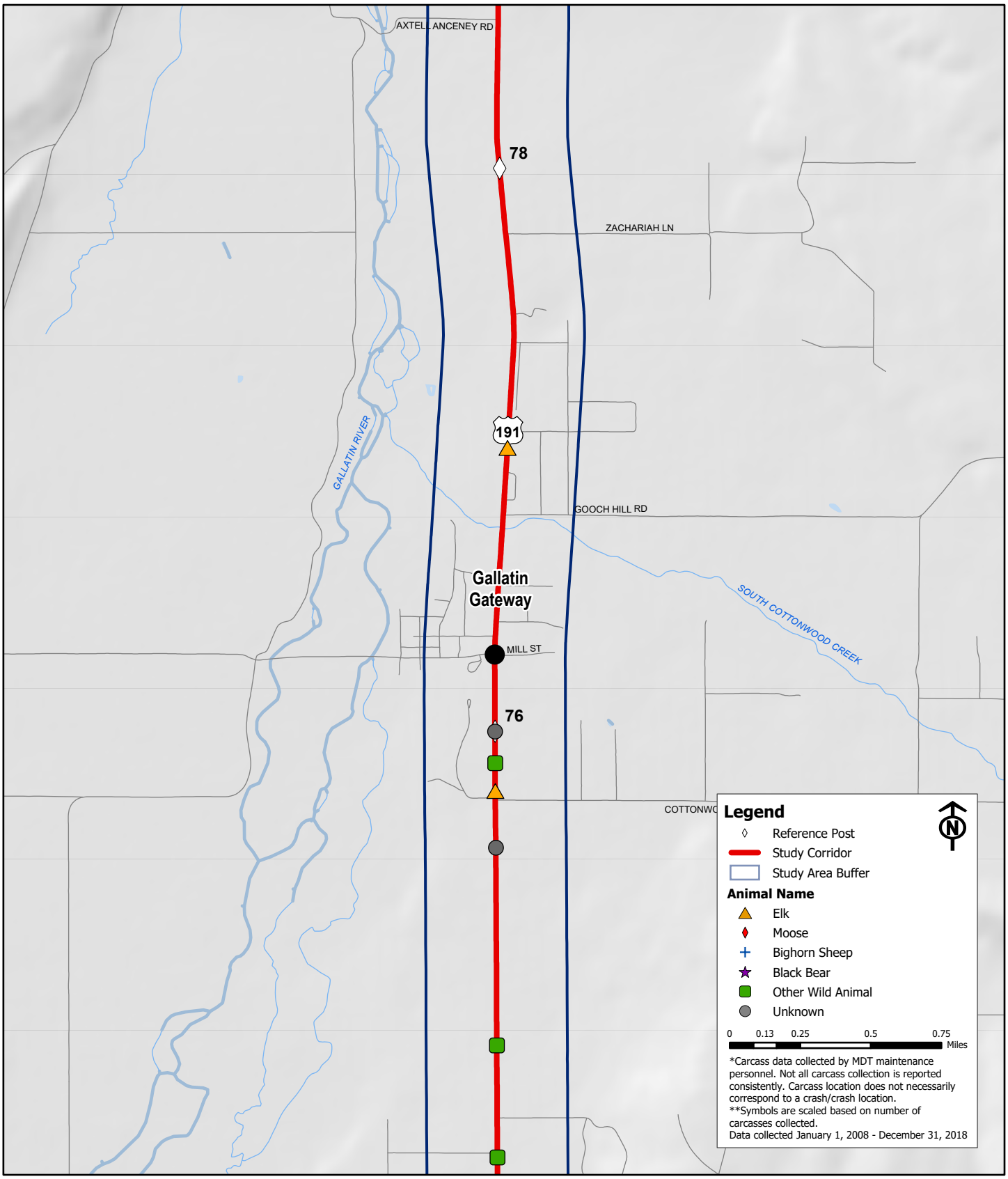





**Figure A.13: Large Mammal Animal Carcasses**

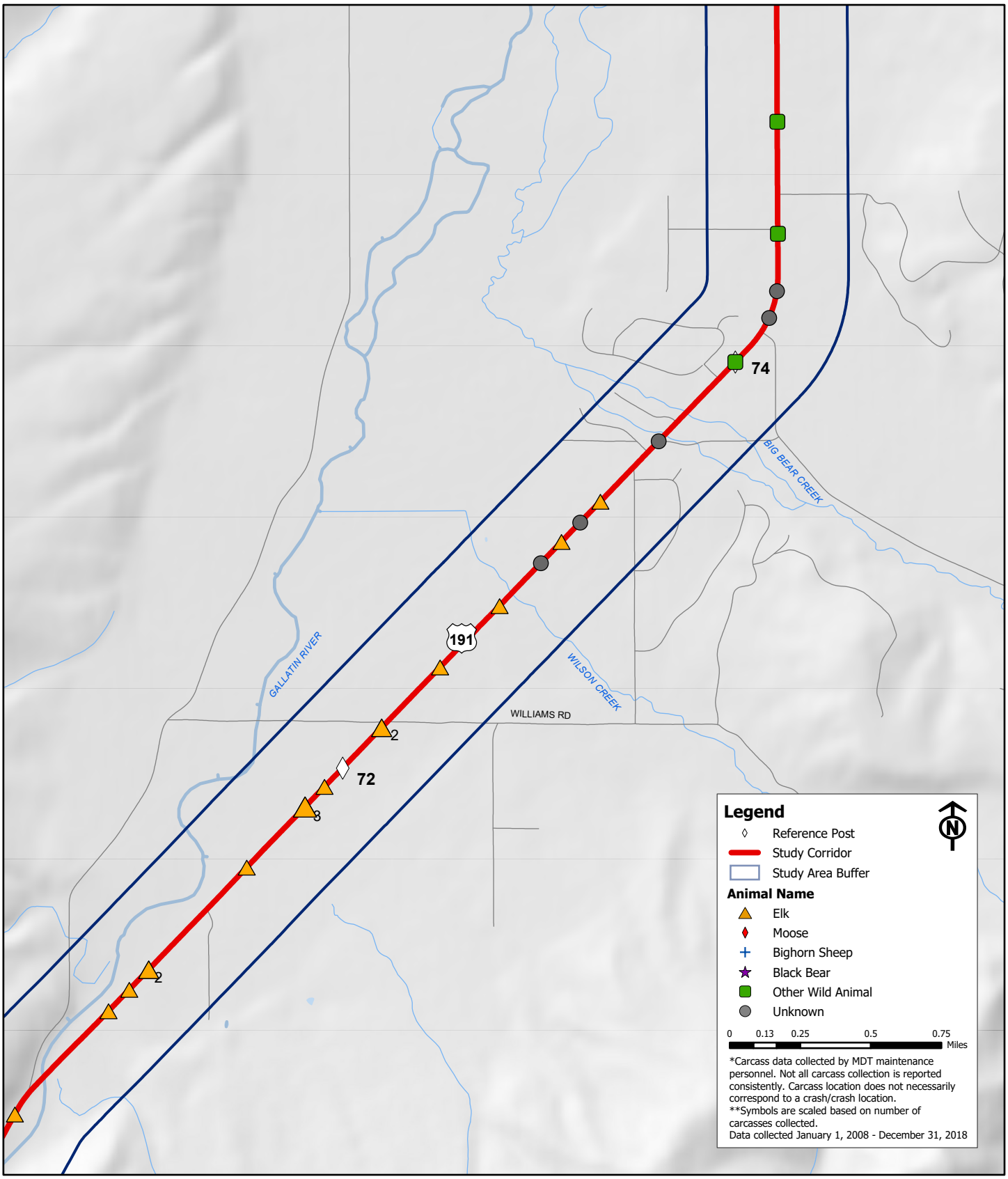





**Figure A.13: Large Mammal Animal Carcasses**

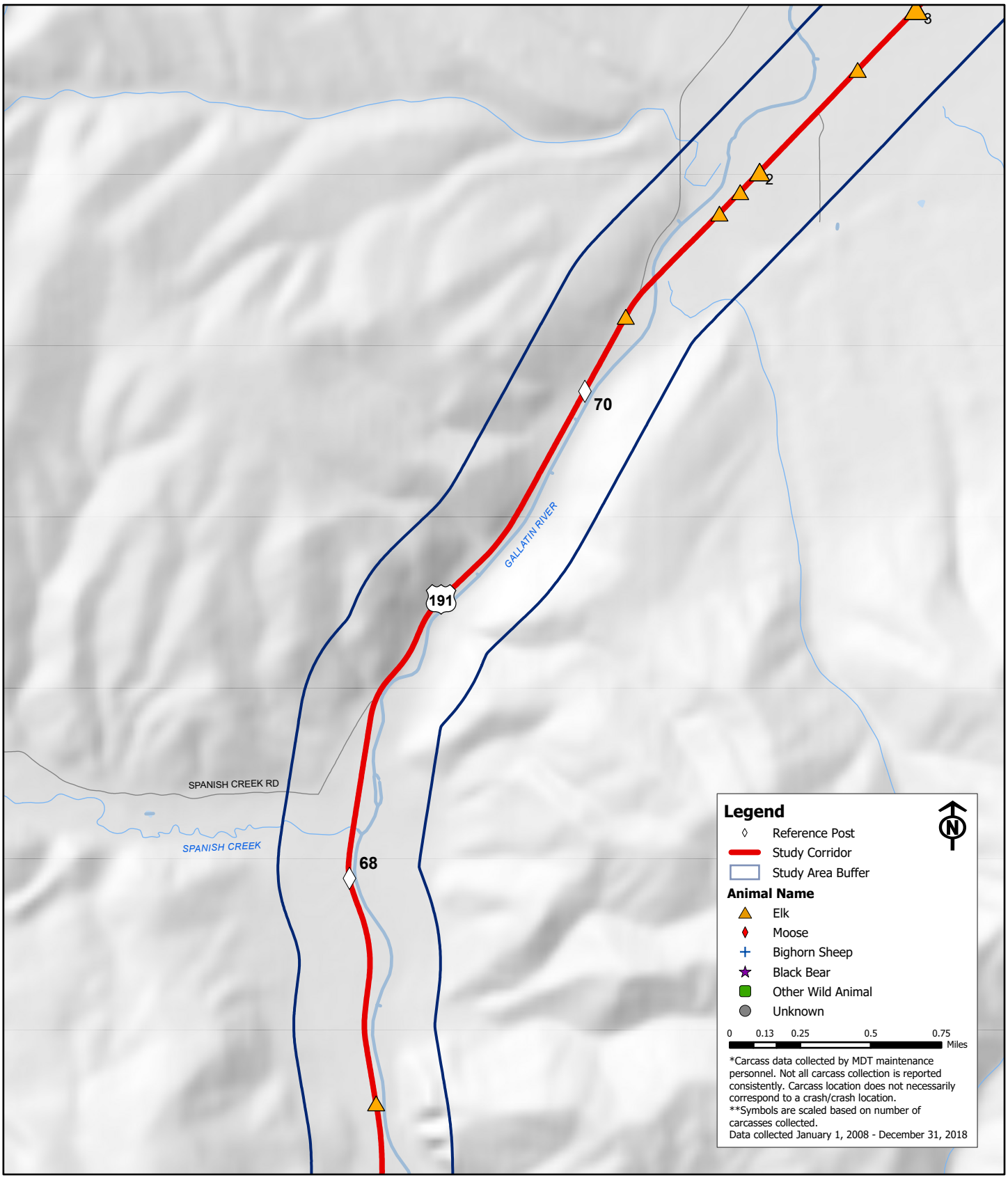



**Figure A.13: Large Mammal Animal Carcasses**

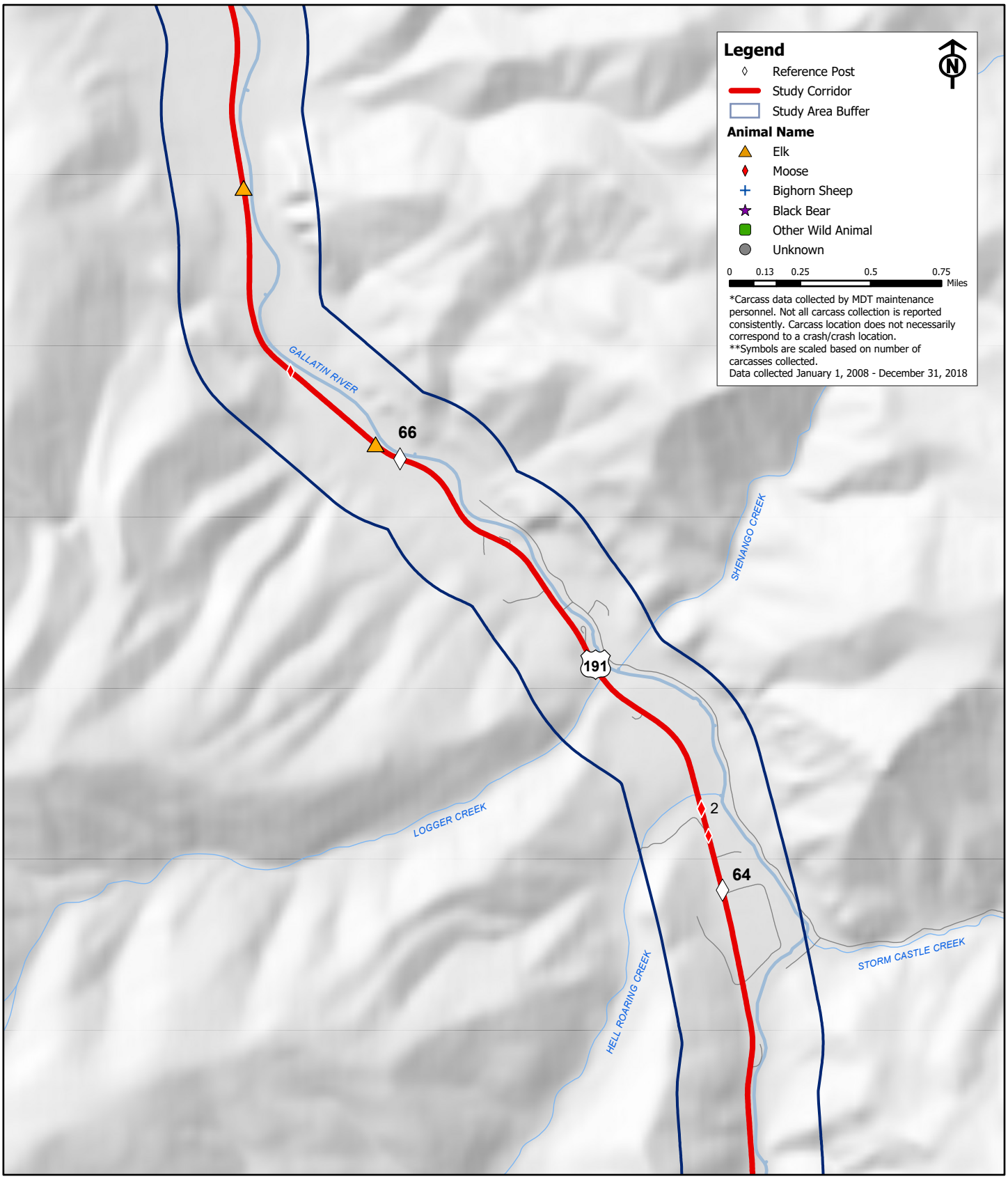





**Figure A.13: Large Mammal Animal Carcasses**

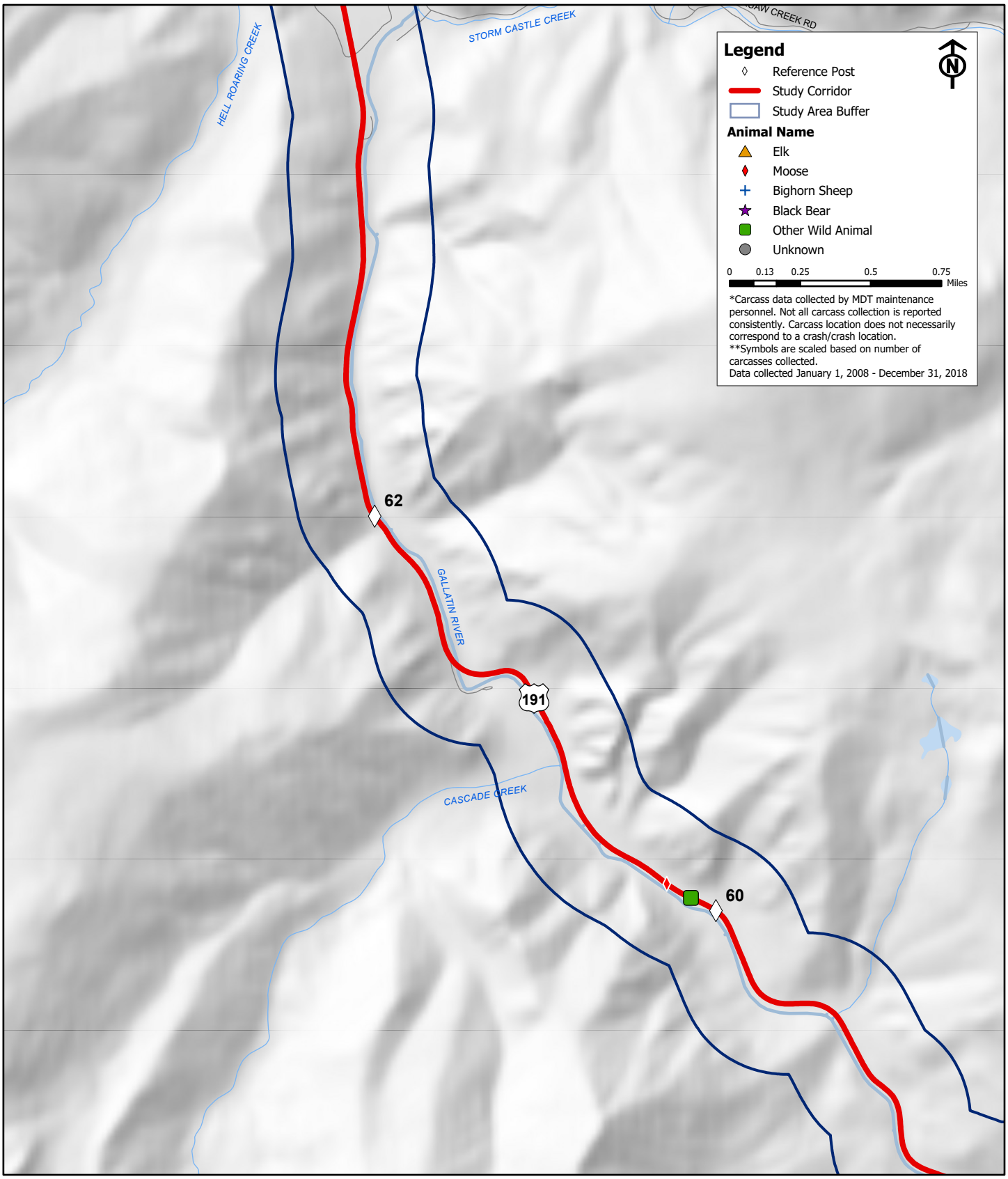





**Figure A.13: Large Mammal Animal Carcasses**

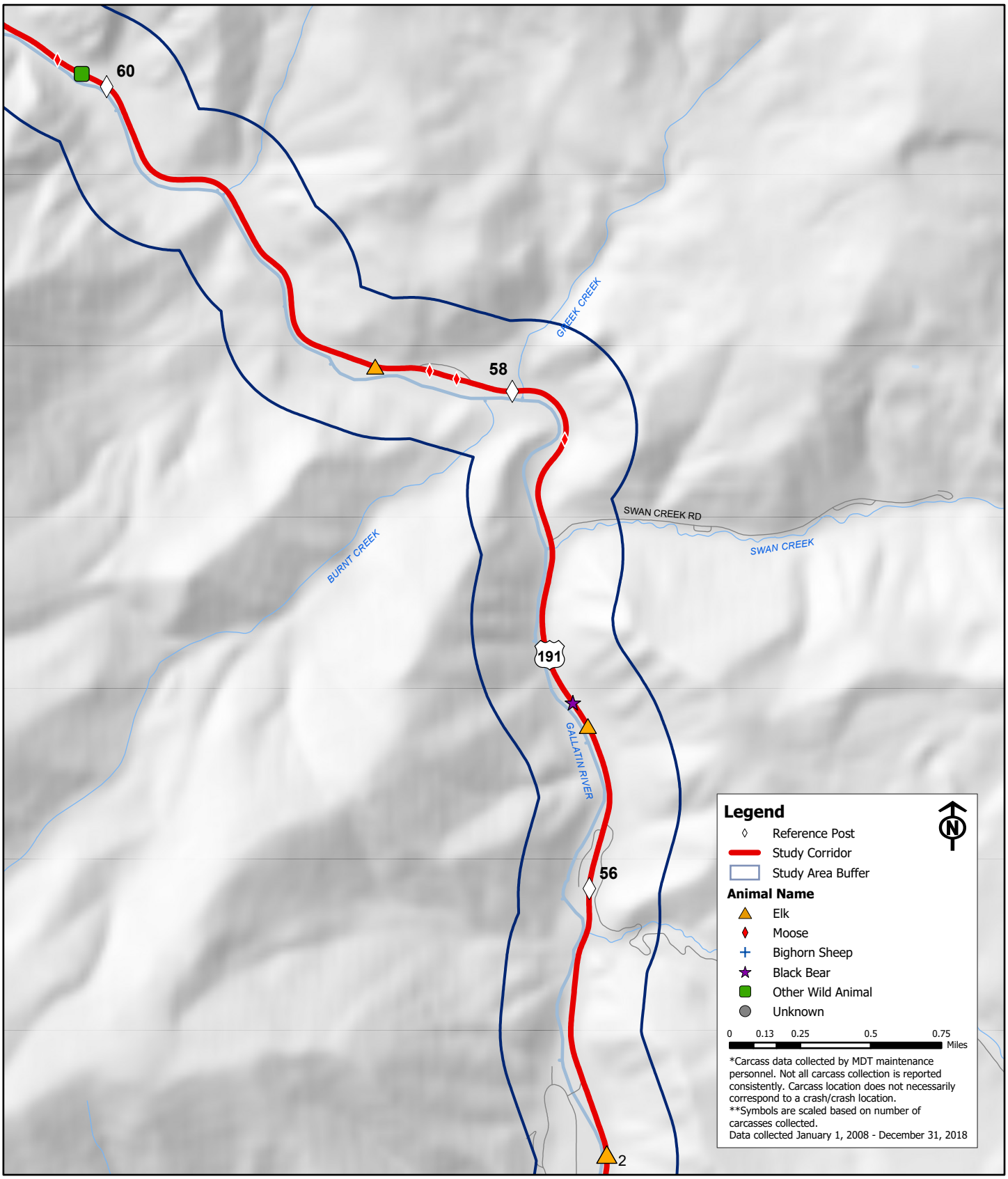



**Figure A.13: Large Mammal Animal Carcasses**

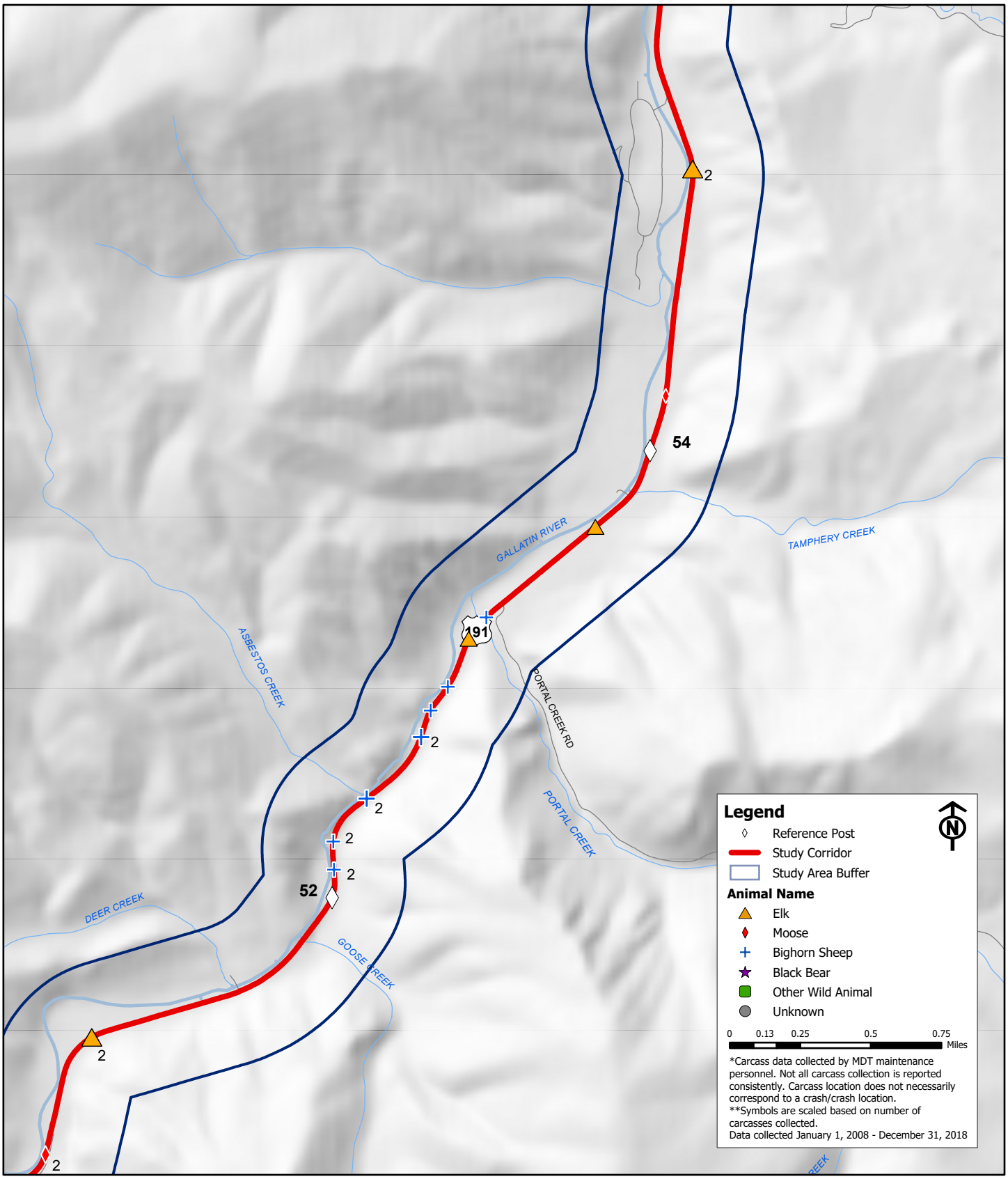
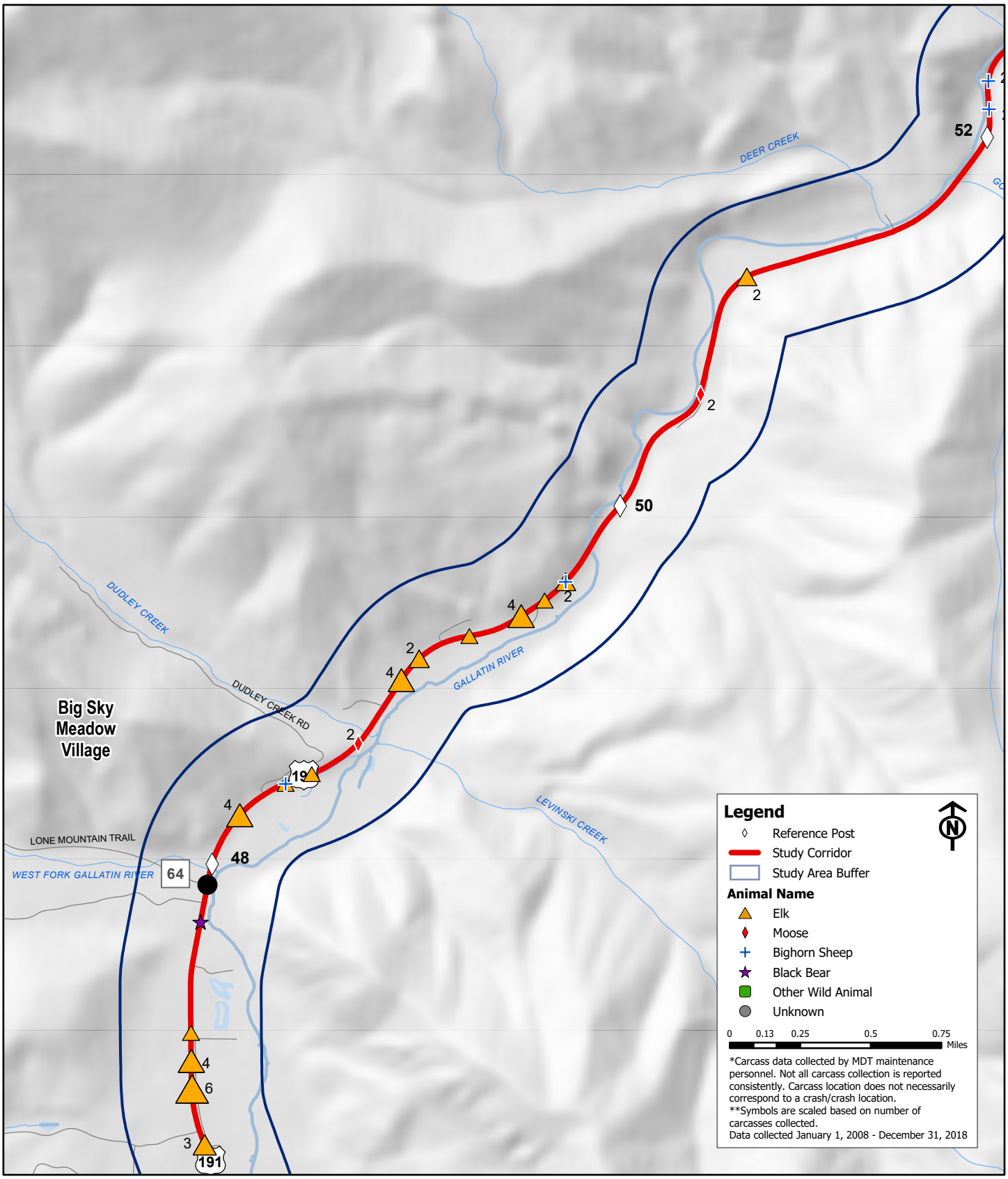





**Figure A.13: Large Mammal Animal Carcasses**


DEER CREEK
52
2
2
50
4
2
2
4
GALLATIN RIVER
DUDLEY CREEK
DUDLEY CREEK RD
Big Sky
Meadow
Village
19
4
LONE MOUNTAIN TRAIL
WEST FORK GALLATIN RIVER
64
48
LEVINSKI CREEK
4
6
3
191
Legend
Reference Post
Study Corridor
Study Area Buffer
Animal Name
Elk
Moose
Bighorn Sheep
Black Bear
Other Wild Animal
Unknown
0 0.13 0.25 0.5 0.75
Miles
*Carcass data collected by MDT maintenance personnel. Not all carcass collection is reported consistently. Carcass location does not necessarily correspond to a crash/crash location.
**Symbols are scaled based on number of carcasses collected.
Data collected January 1, 2008 - December 31, 2018

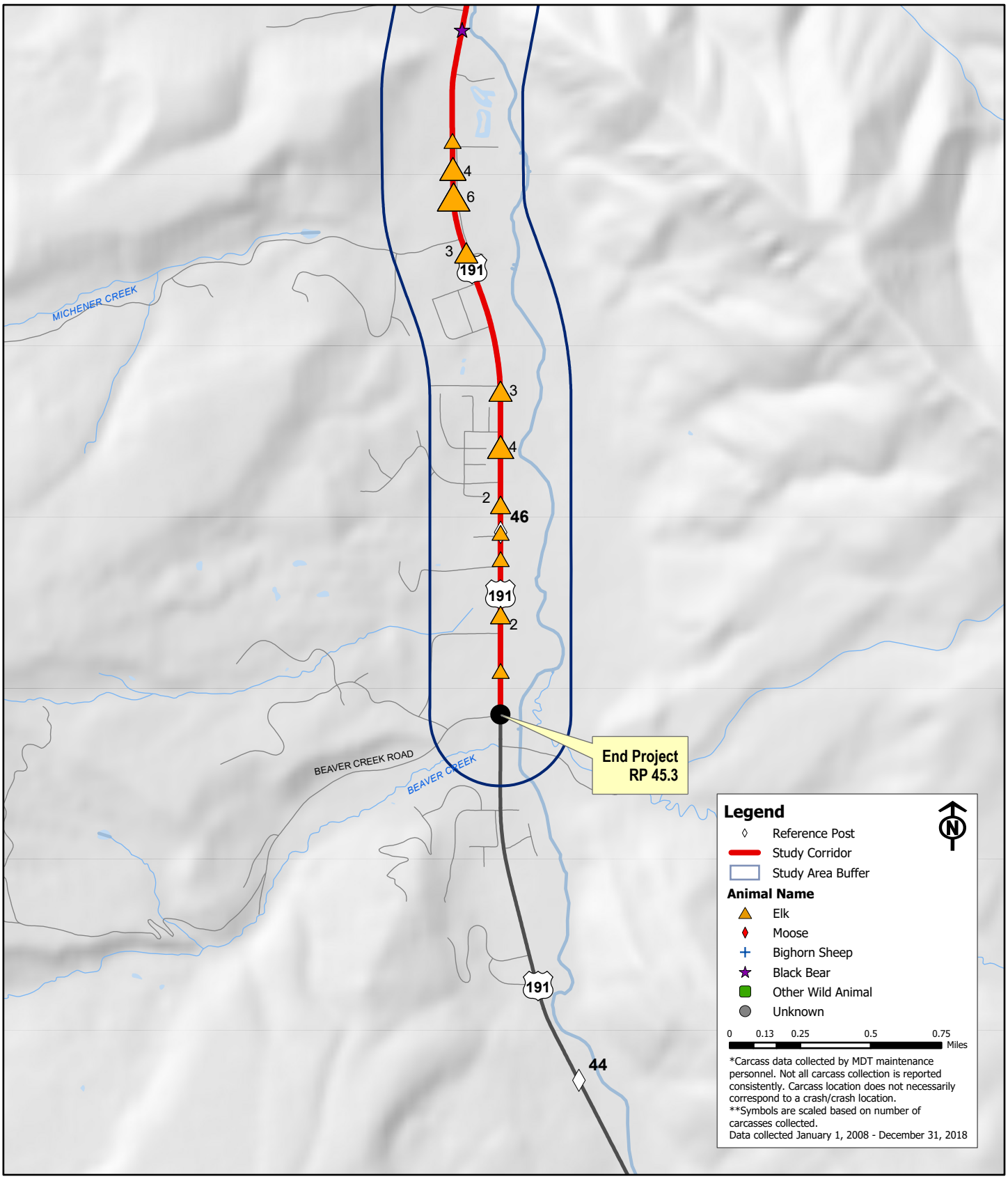





**Figure A.13: Large Mammal Animal Carcasses**

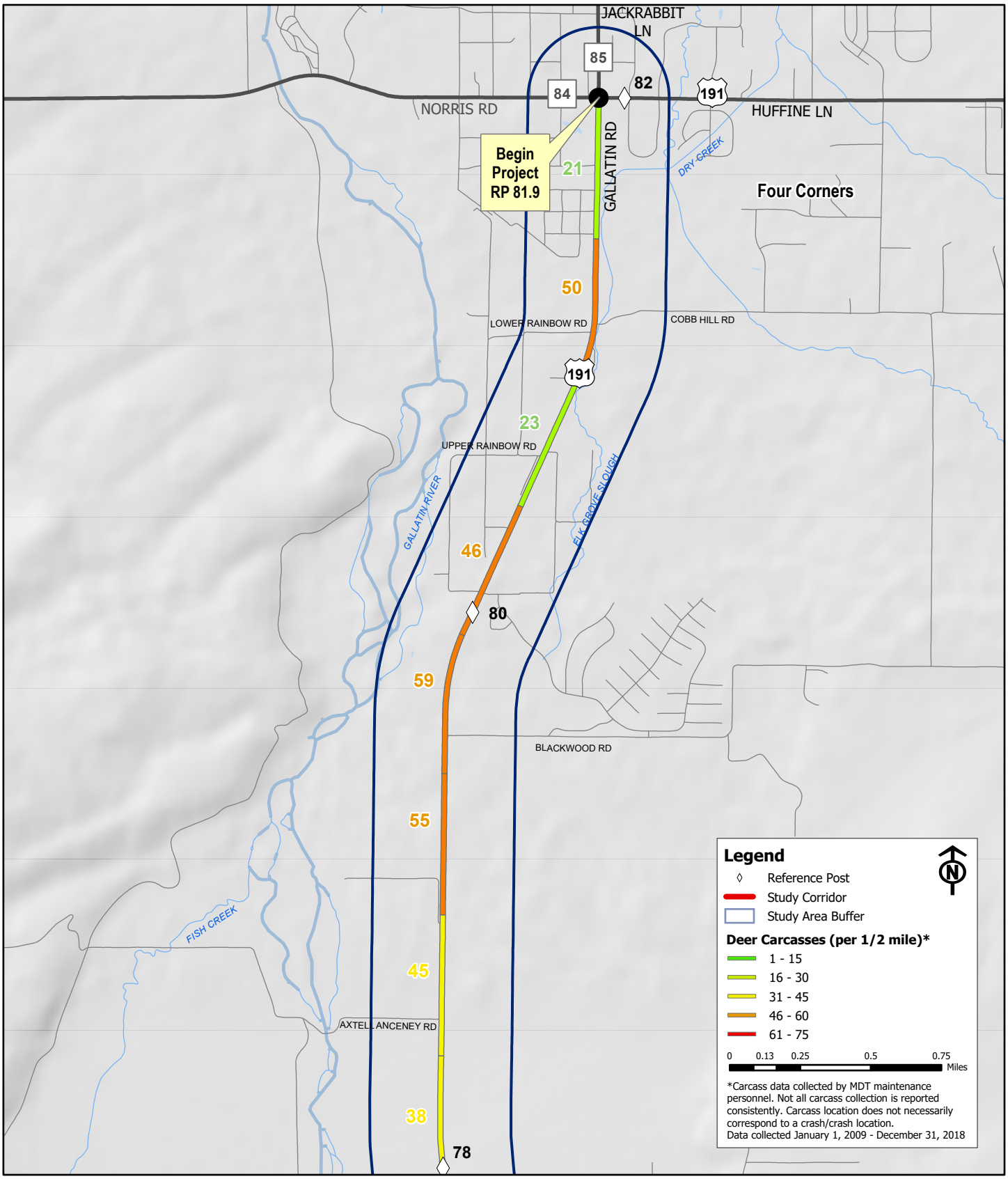





**Figure A.14: Deer Carcasses**

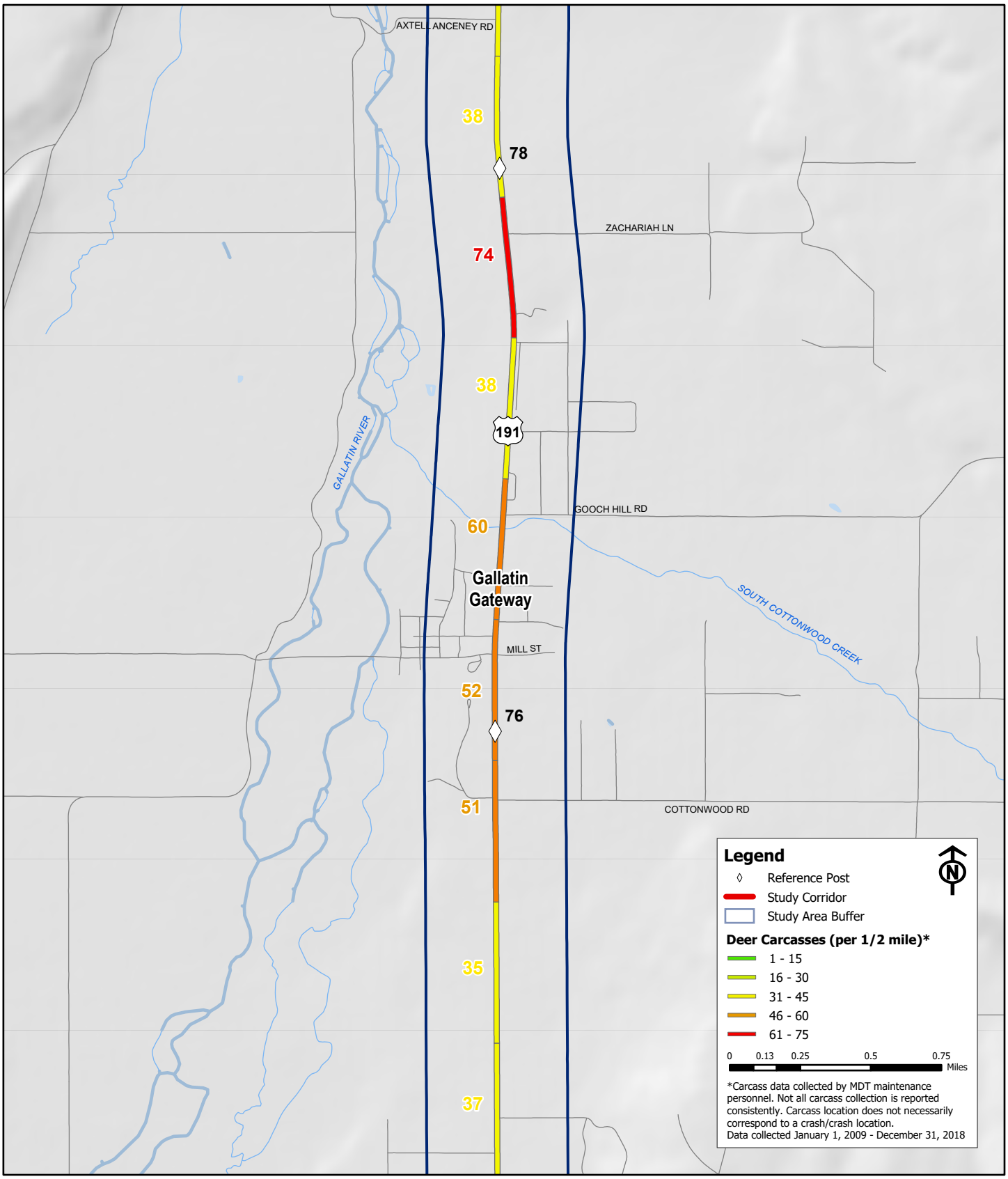





**Figure A.14: Deer Carcasses**

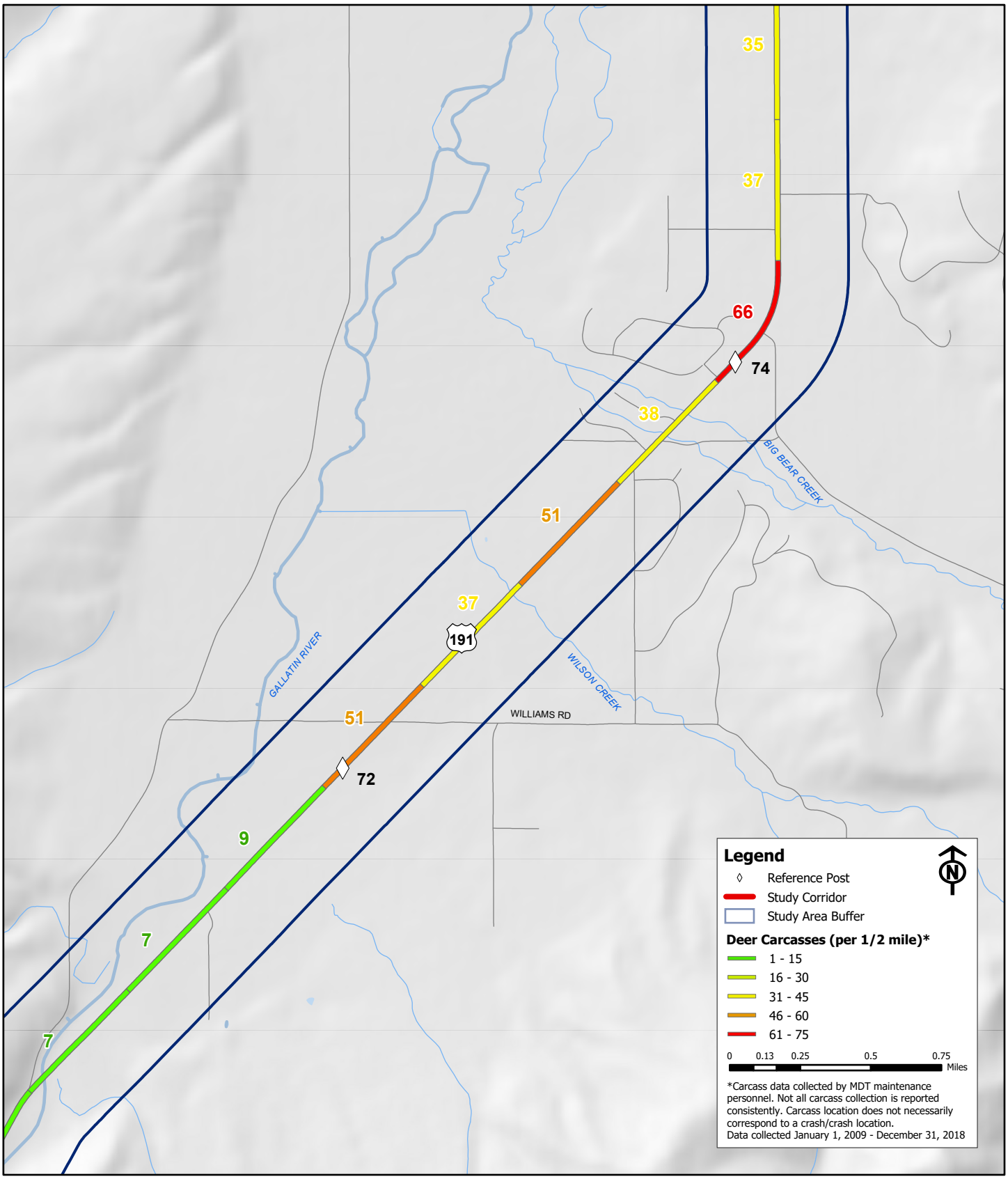





**Figure A.14: Deer Carcasses**

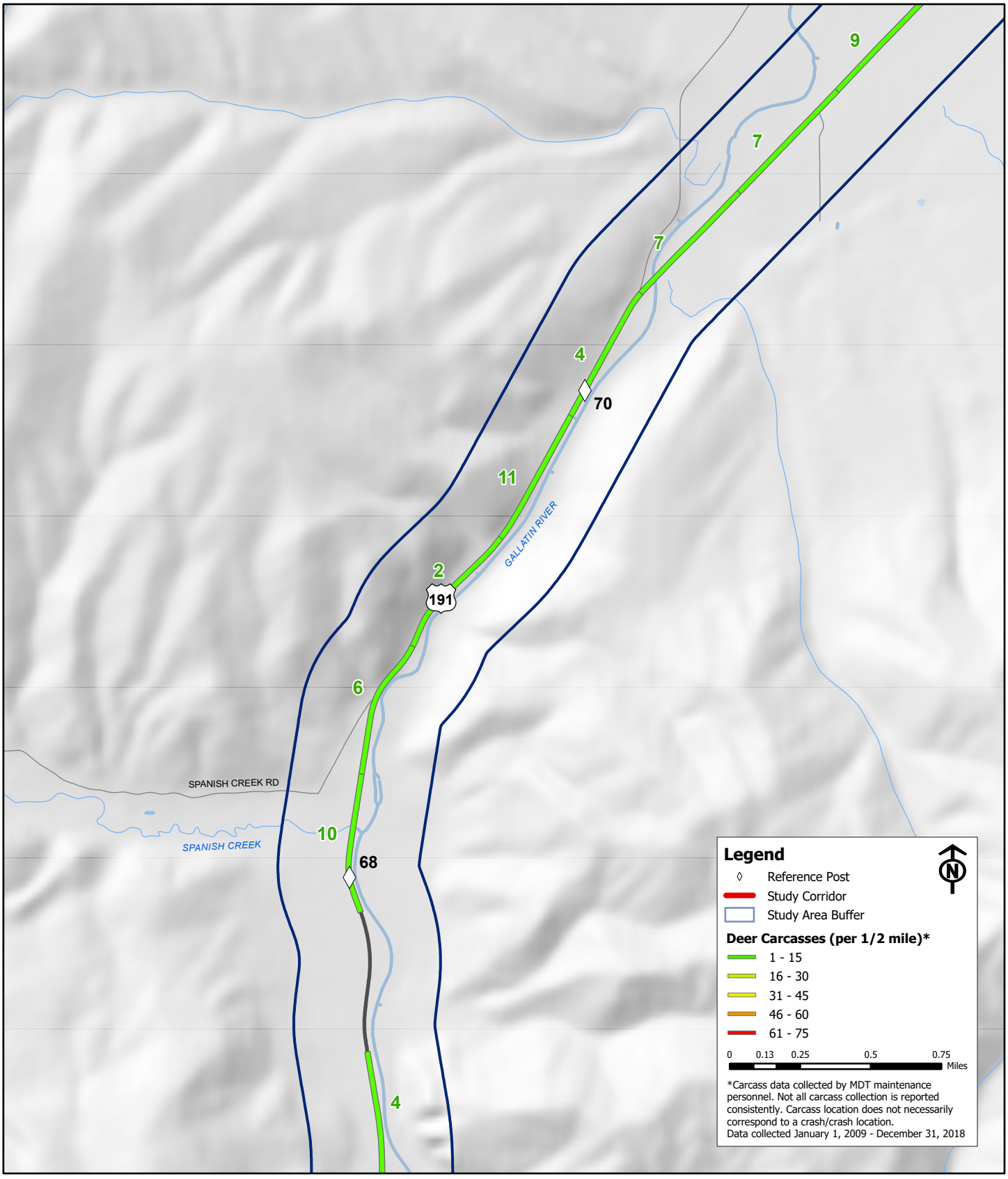





**Figure A.14: Deer Carcasses**

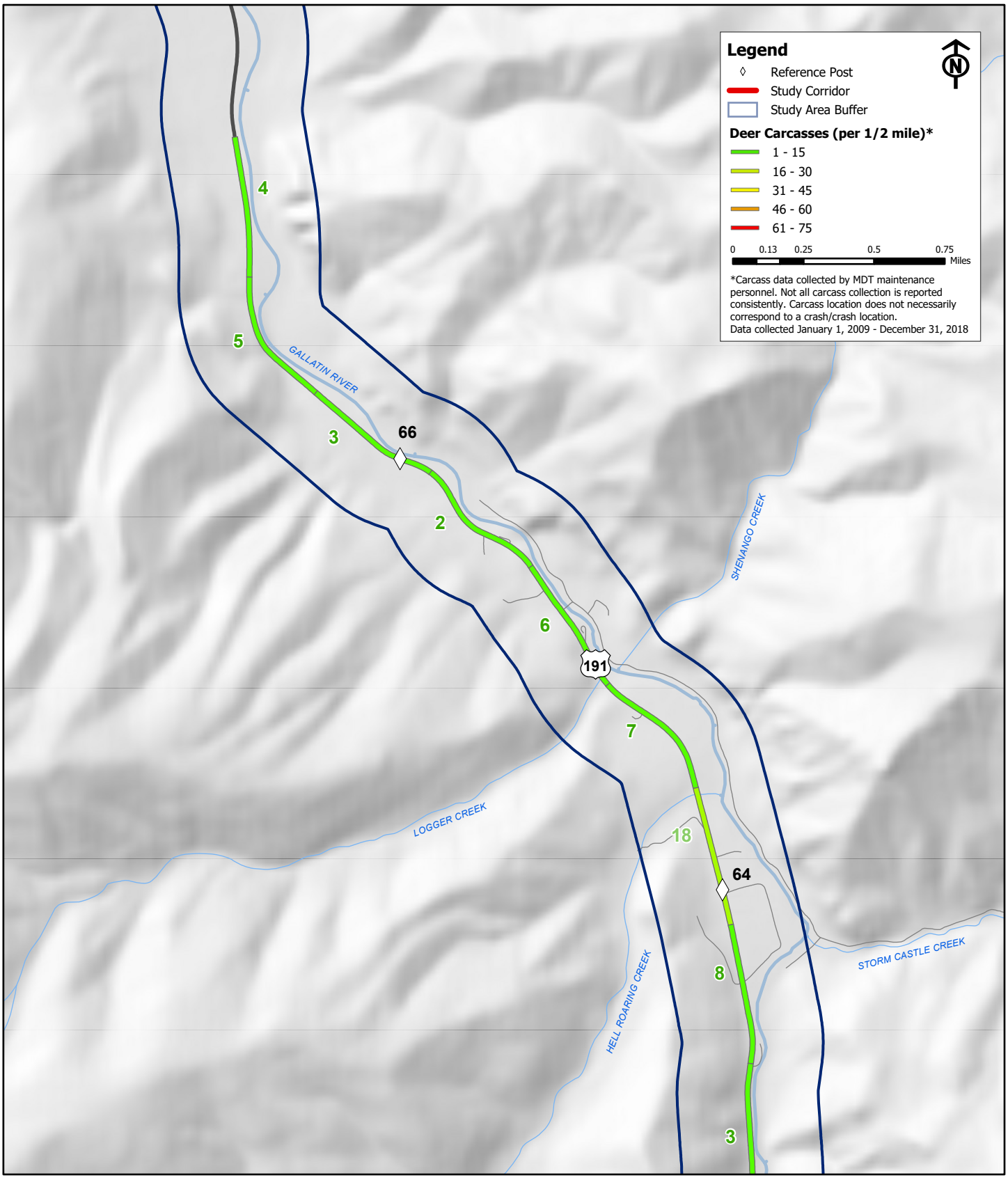





**Figure A.14: Deer Carcasses**

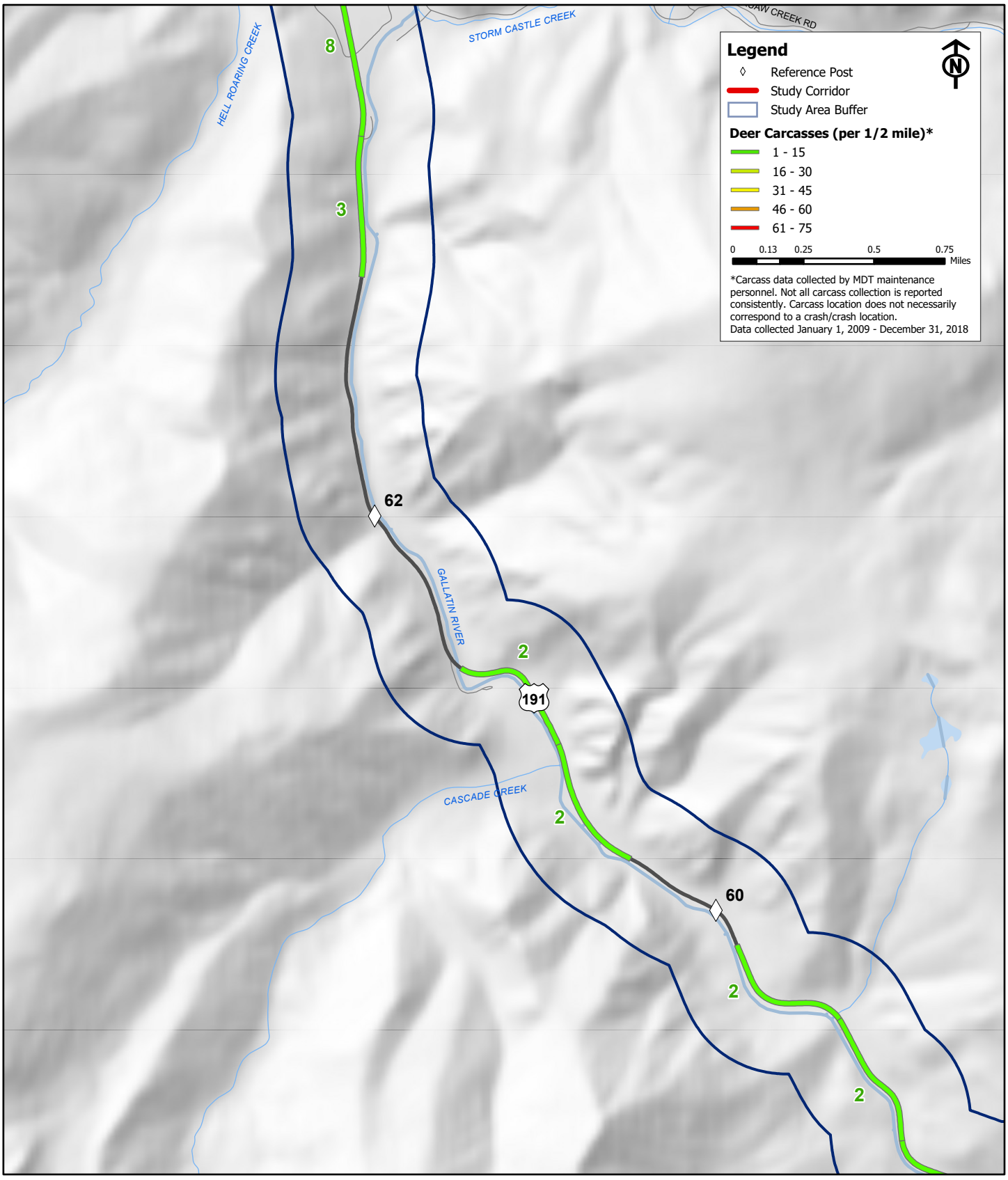





**Figure A.14: Deer Carcasses**

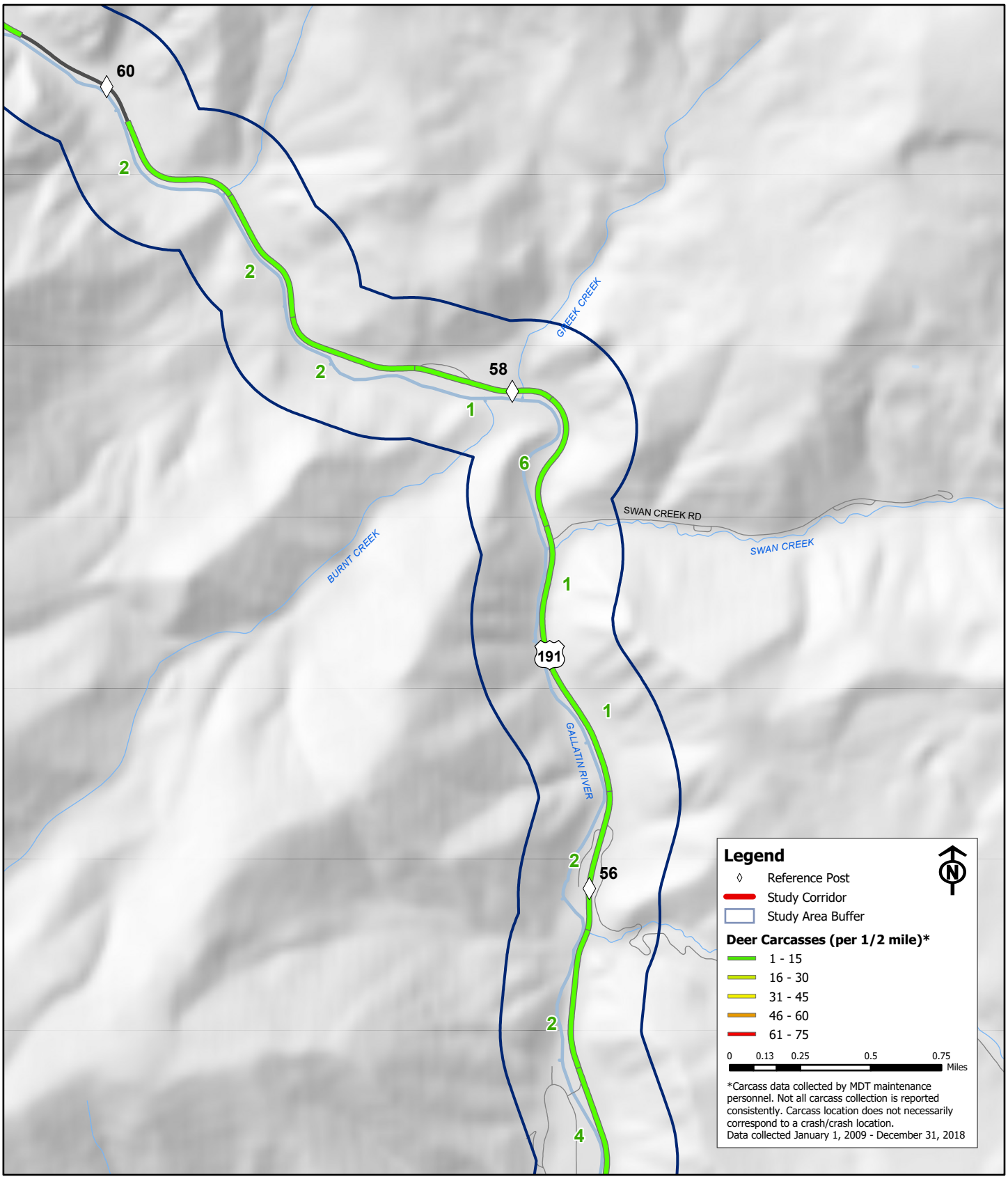





**Figure A.14: Deer Carcasses**

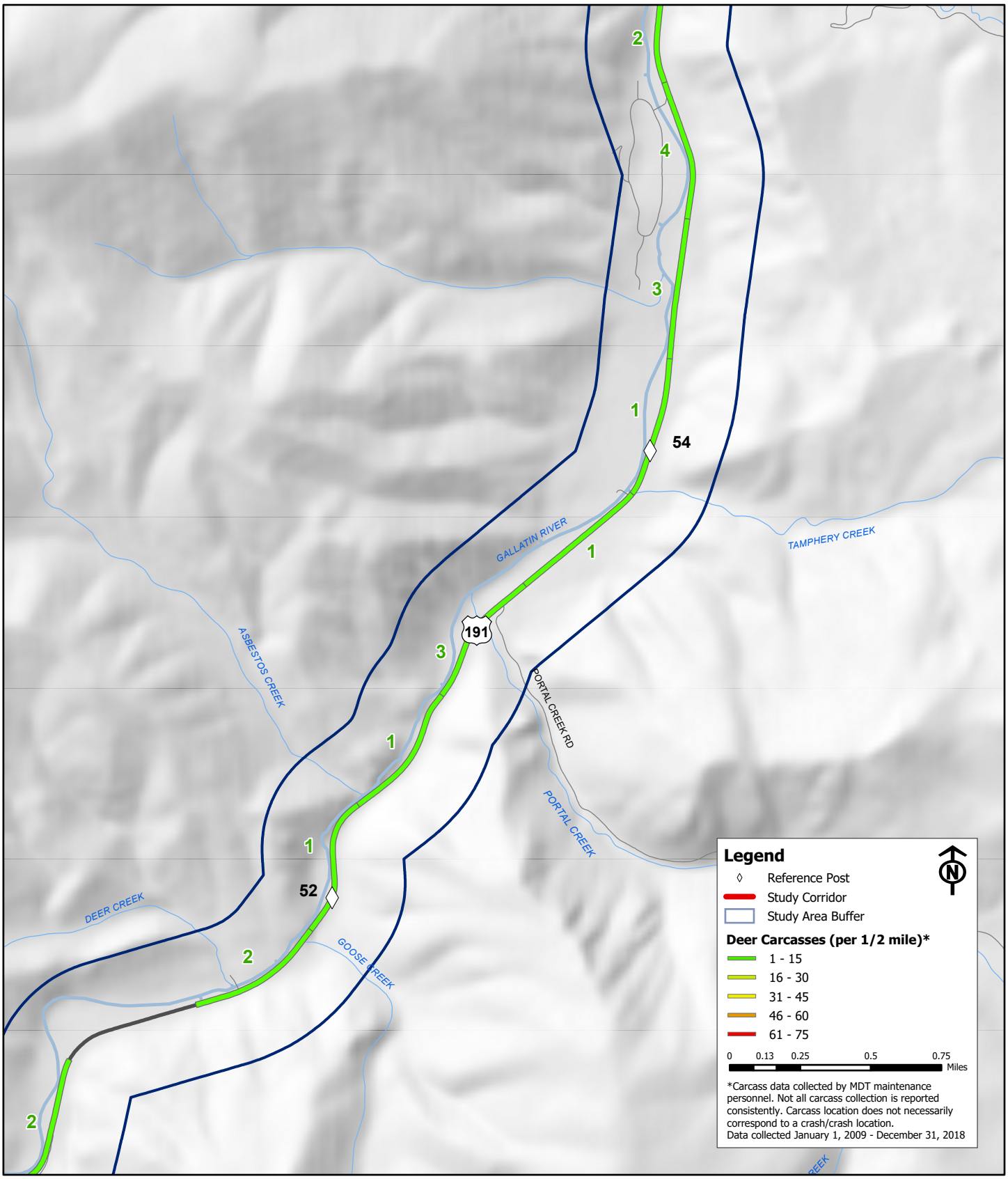
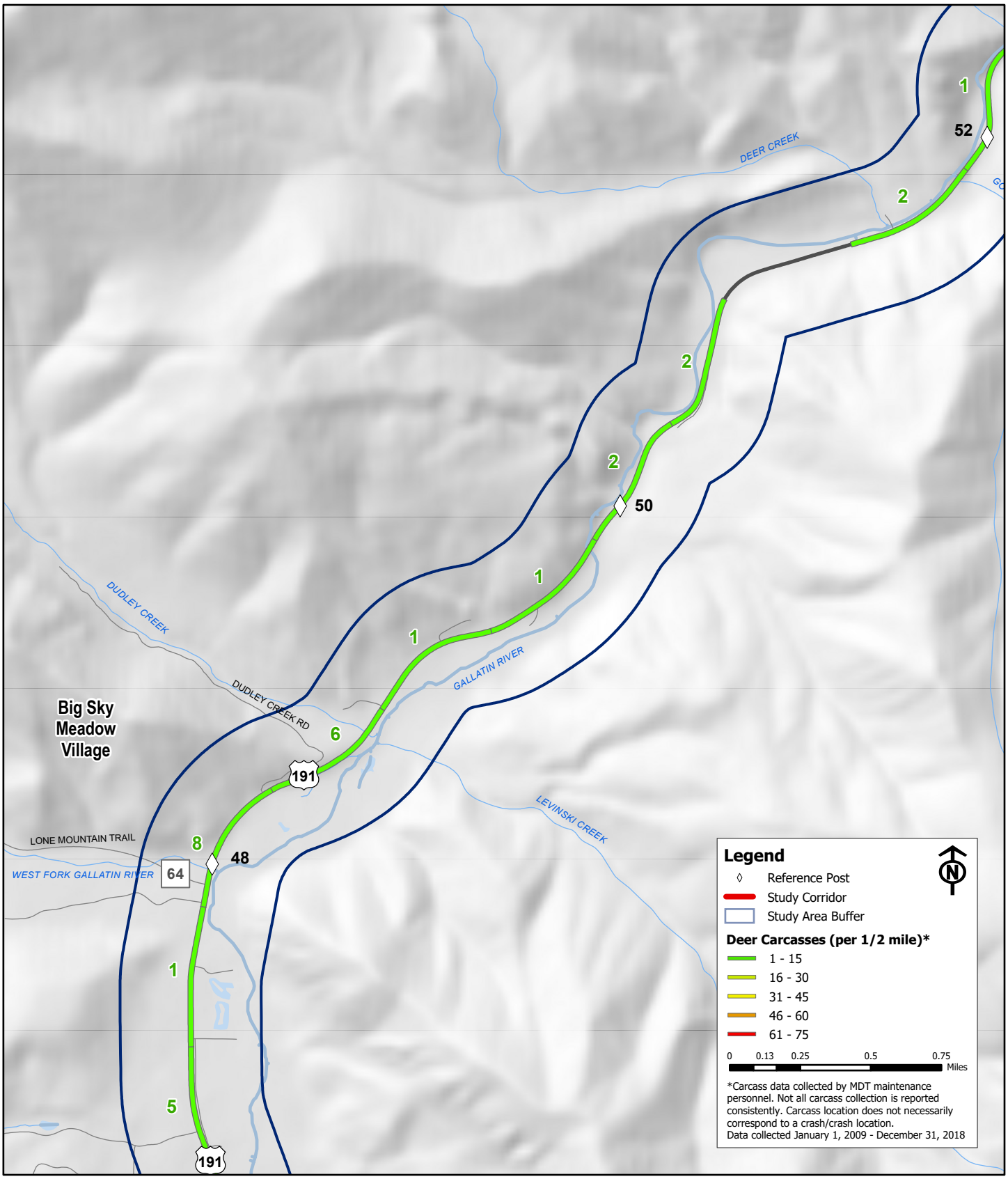
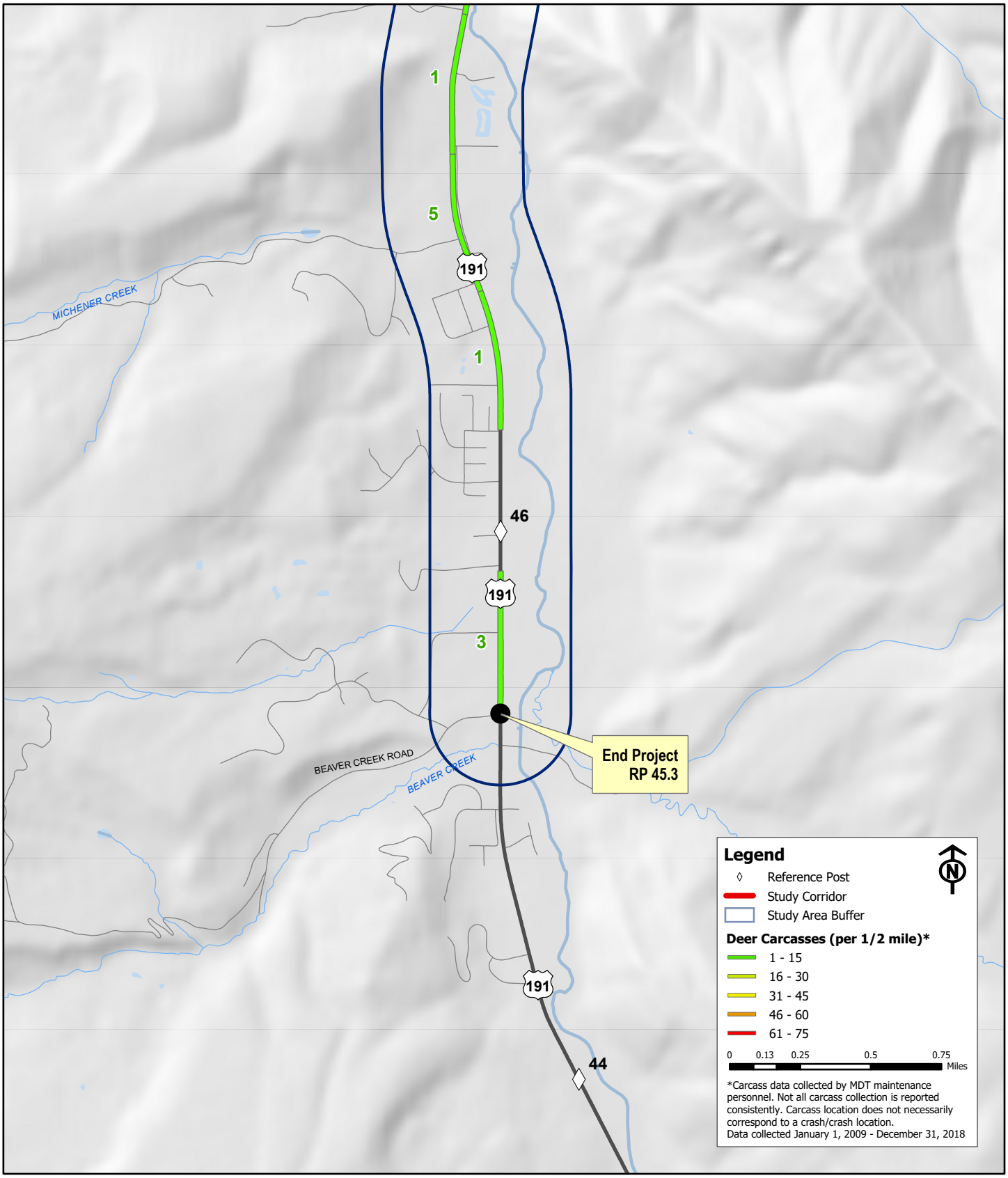





**Figure A.14: Deer Carcasses**


DEER CREEK
52
1
2
2
2
50
1
1
DUDLEY CREEK
DUDLEY CREEK RD
GALLATIN RIVER
6
Big Sky
Meadow
Village
191
LEVINSKI CREEK
LONE MOUNTAIN TRAIL
8
48
WEST FORK GALLATIN RIVER
64
1
5
191
Legend
Reference Post
Study Corridor
Study Area Buffer
Deer Carcasses (per 1/2 mile)*
1 - 15
16 - 30
31 - 45
46 - 60
61 - 75
0 0.13 0.25 0.5 0.75
Miles
*Carcass data collected by MDT maintenance personnel. Not all carcass collection is reported consistently. Carcass location does not necessarily correspond to a crash/crash location.
Data collected January 1, 2009 - December 31, 2018


1
5
191
MICHENER CREEK
1
46
191
3
BEAVER CREEK ROAD
BEAVER CREEK
End Project
RP 45.3
191
44
Legend
Reference Post
Study Corridor
Study Area Buffer
Deer Carcasses (per 1/2 mile)*
1 - 15
16 - 30
31 - 45
46 - 60
61 - 75
0 0.13 0.25 0.5 0.75
Miles
*Carcass data collected by MDT maintenance personnel. Not all carcass collection is reported consistently. Carcass location does not necessarily correspond to a crash/crash location.
Data collected January 1, 2009 - December 31, 2018

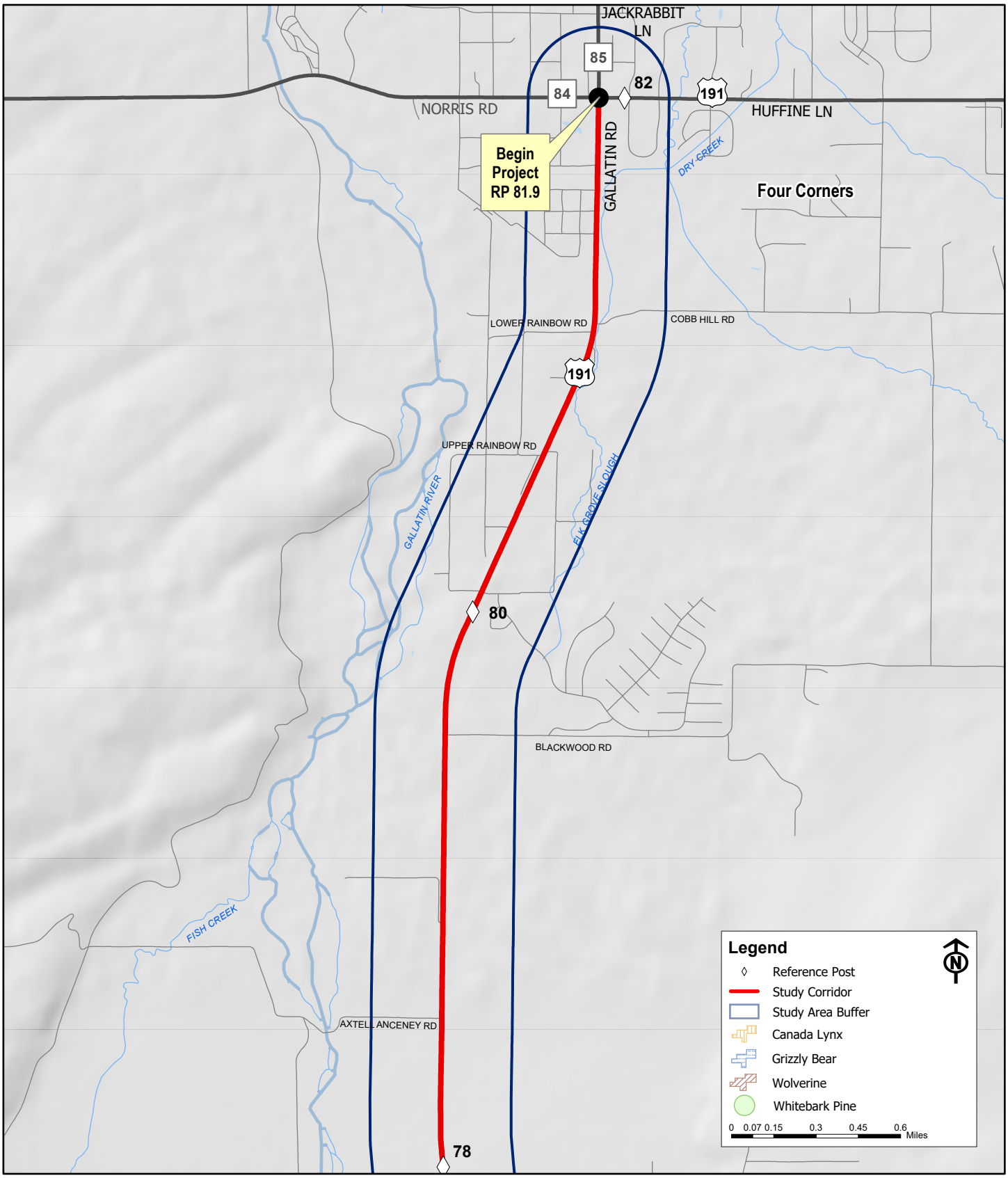





**Figure A.15: USFWS Threatened and Endangered Species**

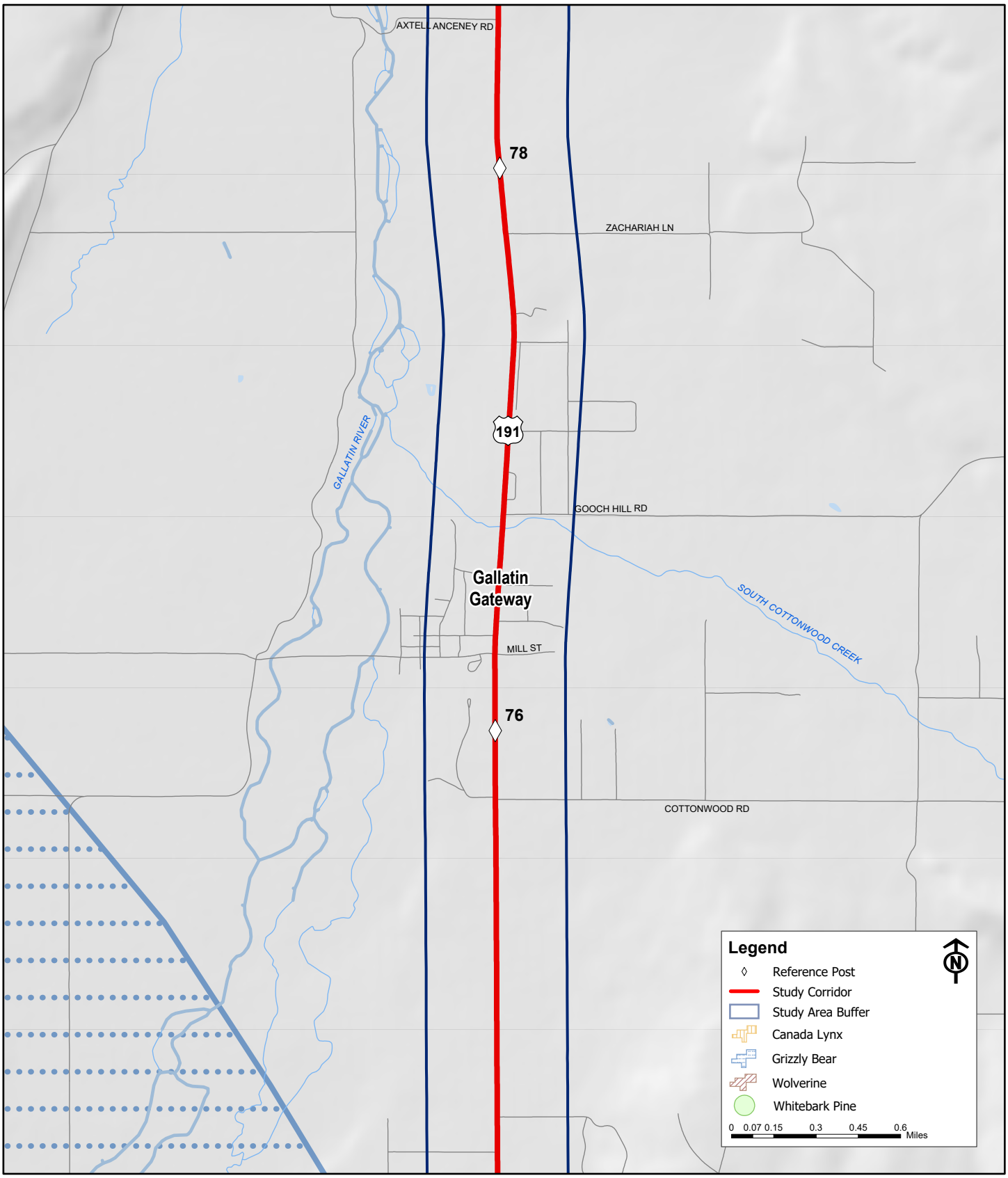





**Figure A.15: USFWS Threatened and Endangered Species**

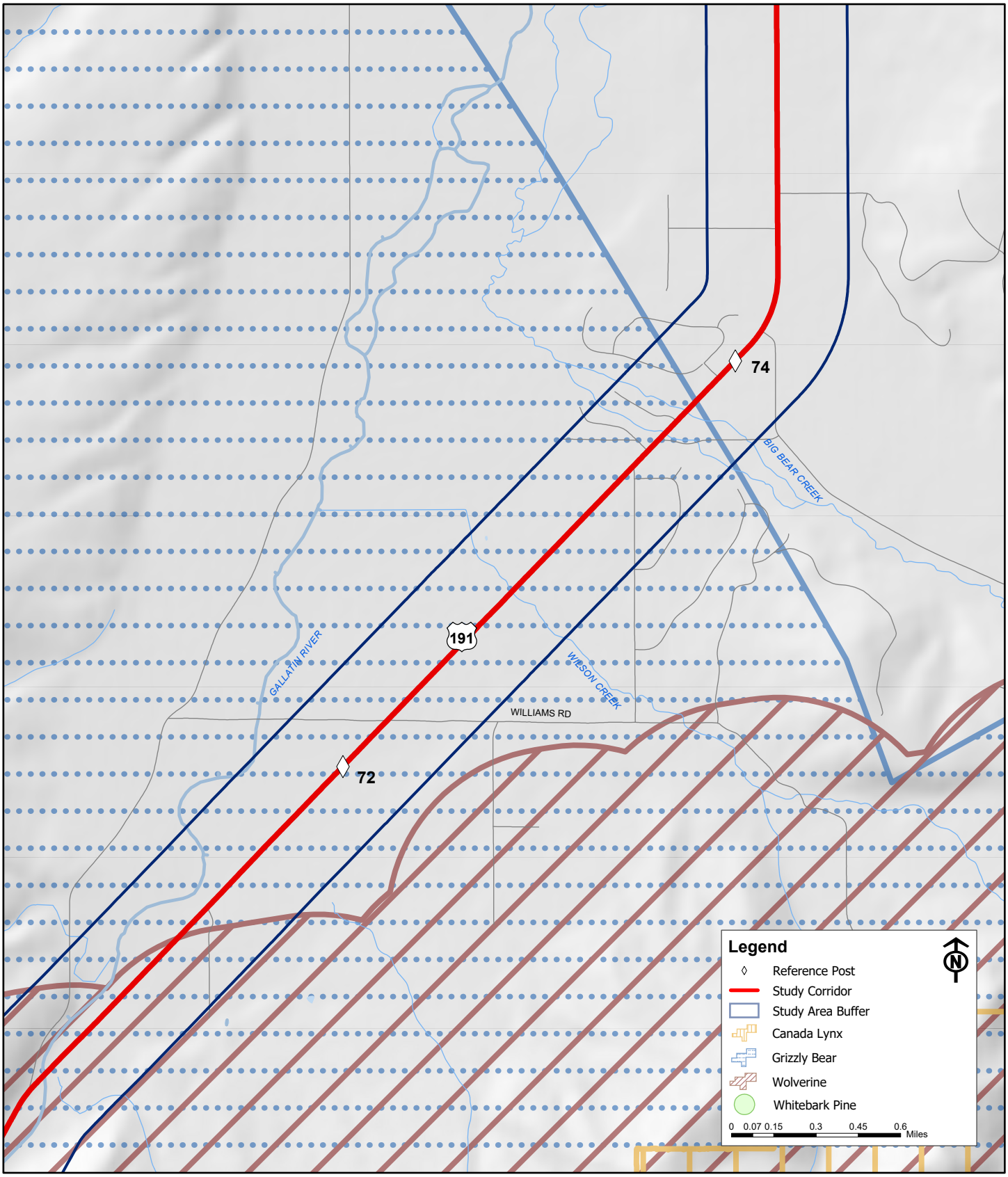





**Figure A.15: USFWS Threatened and Endangered Species**

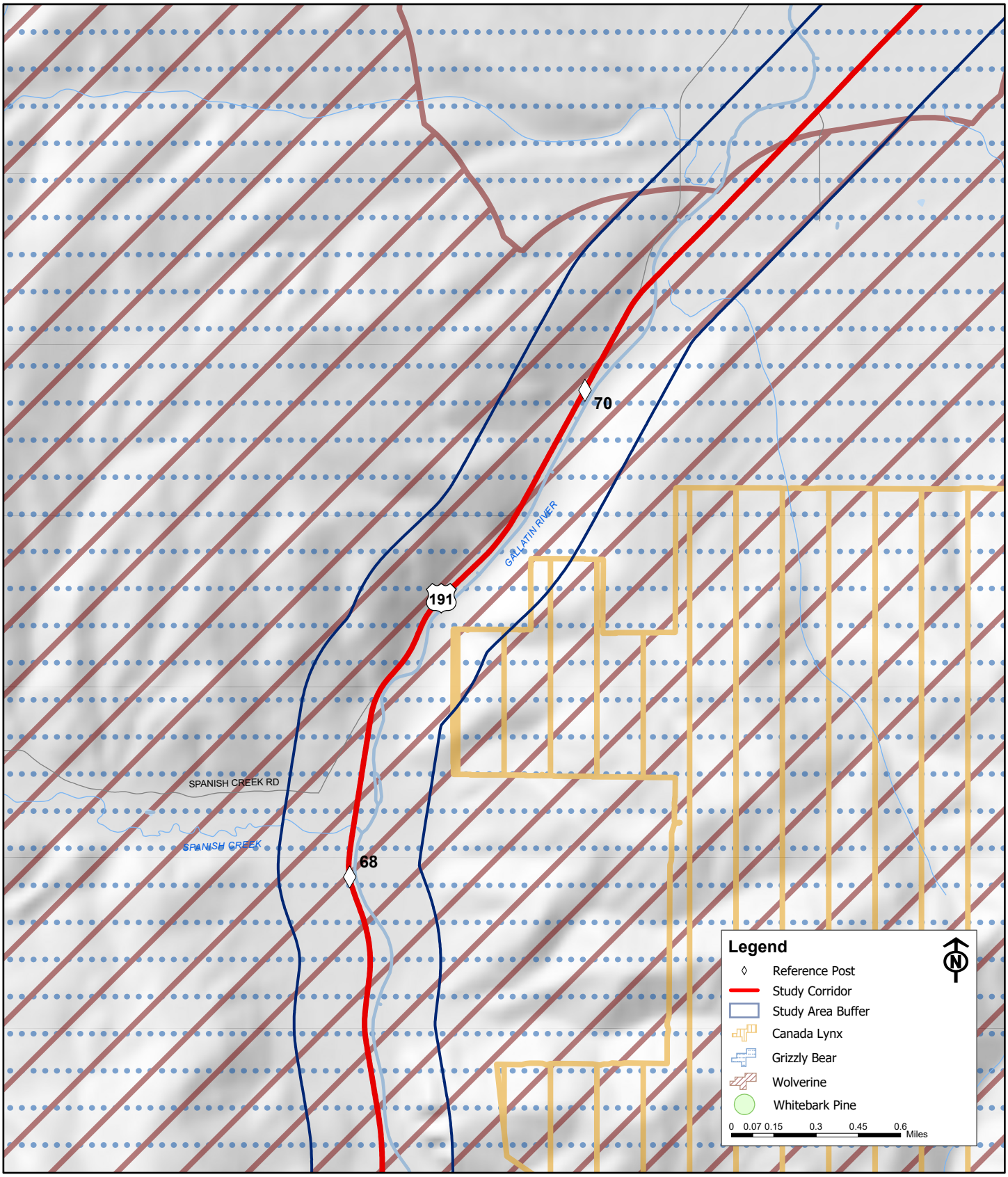





**Figure A.15: USFWS Threatened and Endangered Species**

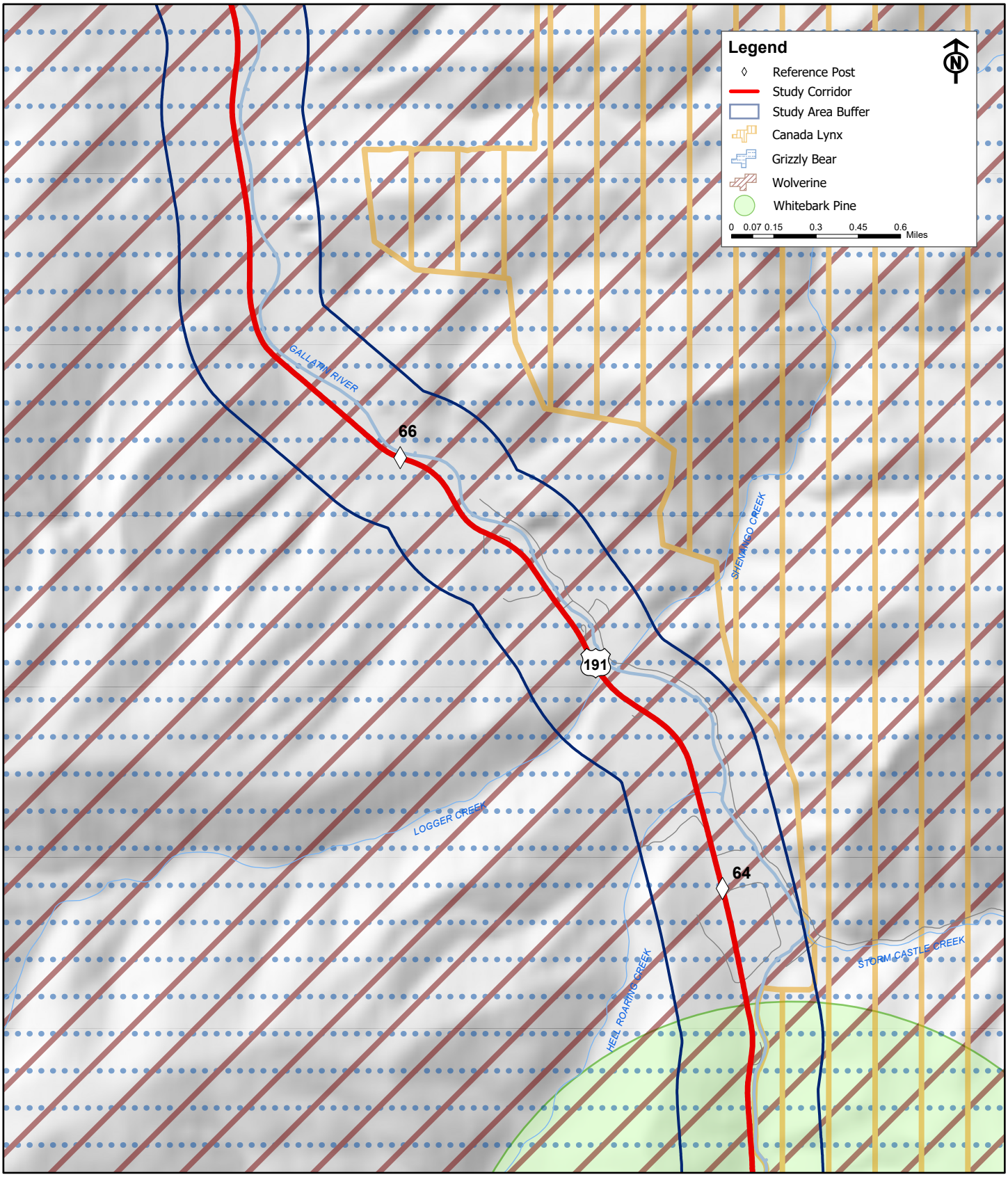





**Figure A.15: USFWS Threatened and Endangered Species**

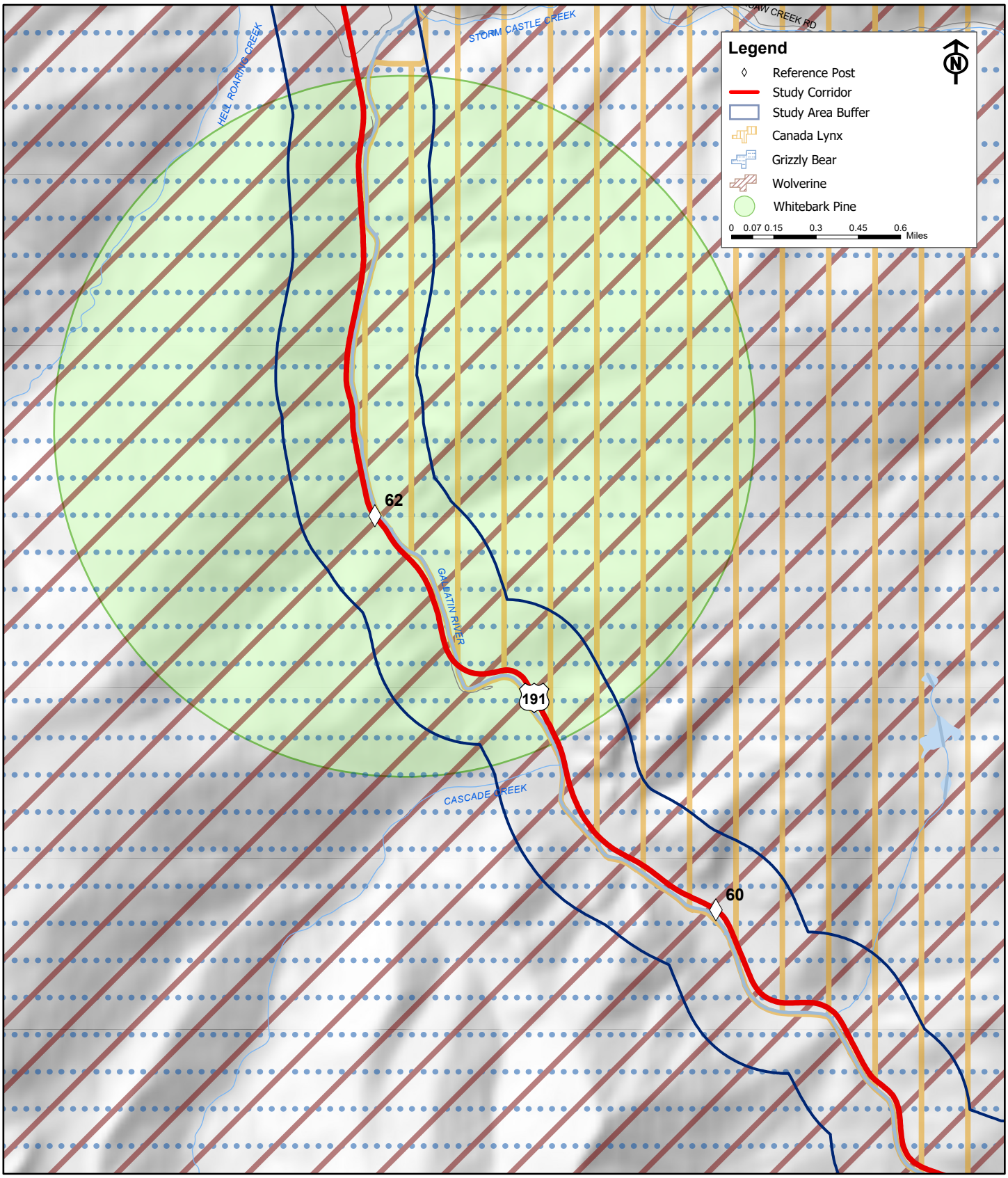





**Figure A.15: USFWS Threatened and Endangered Species**

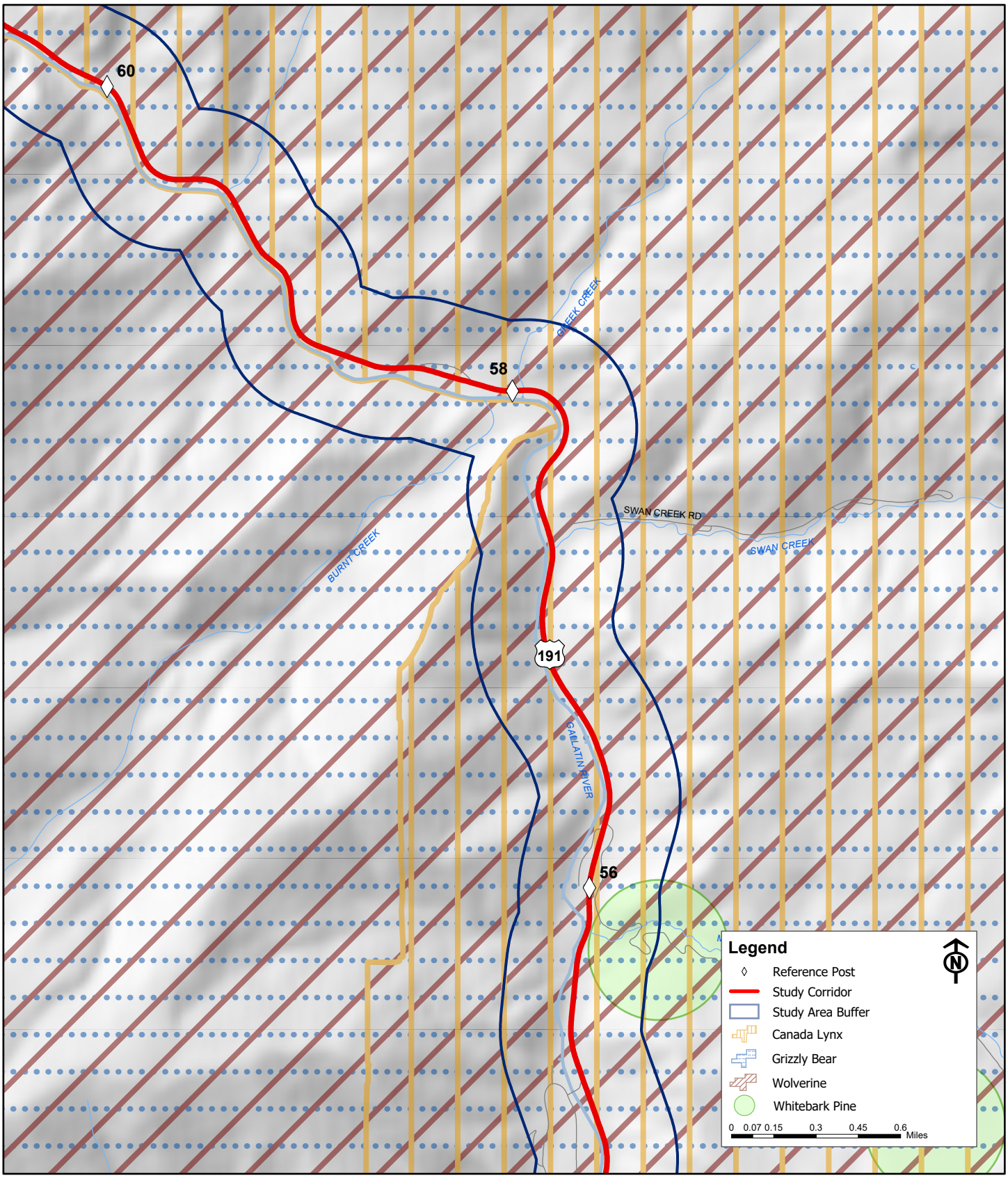





**Figure A.15: USFWS Threatened and Endangered Species**

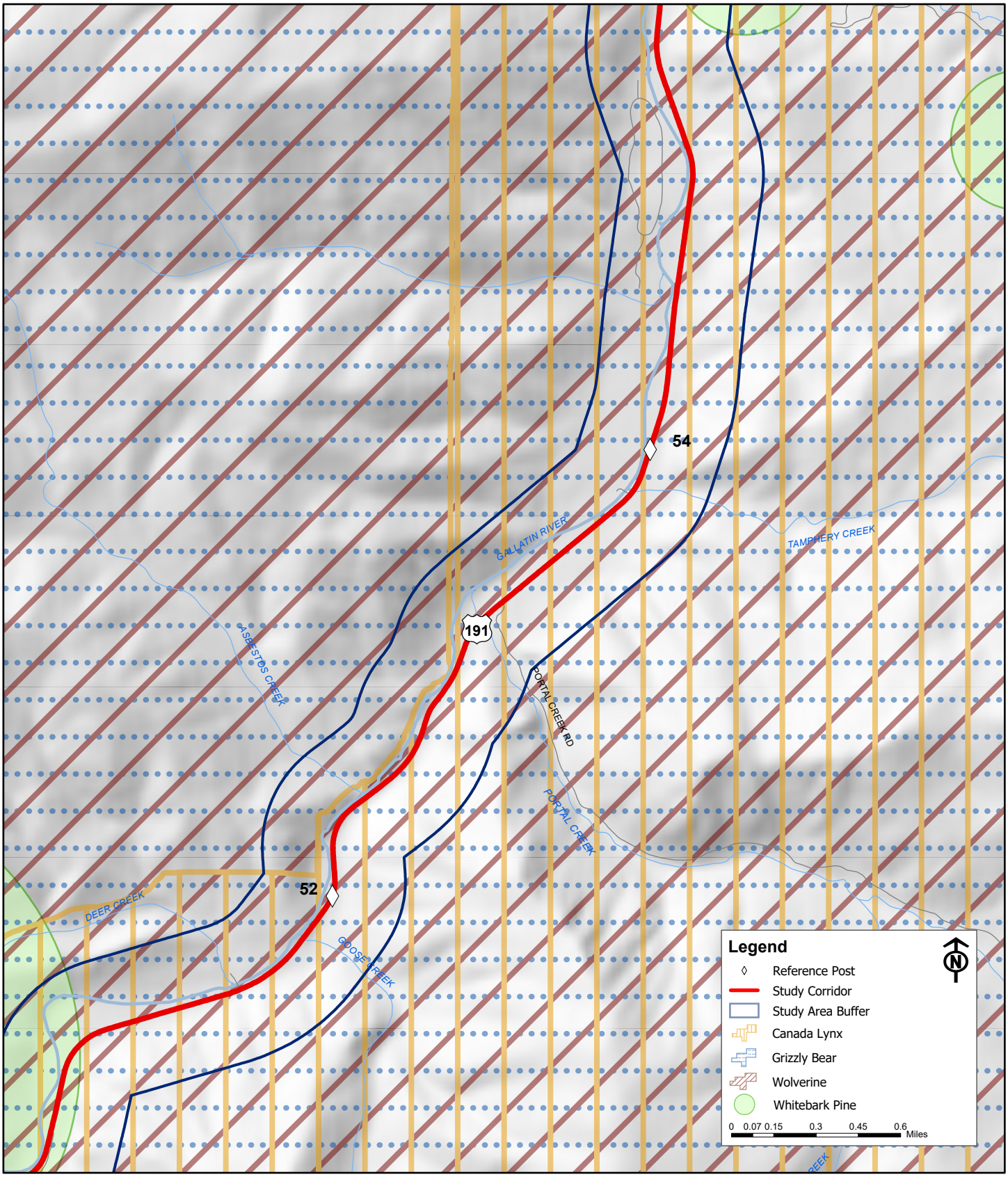
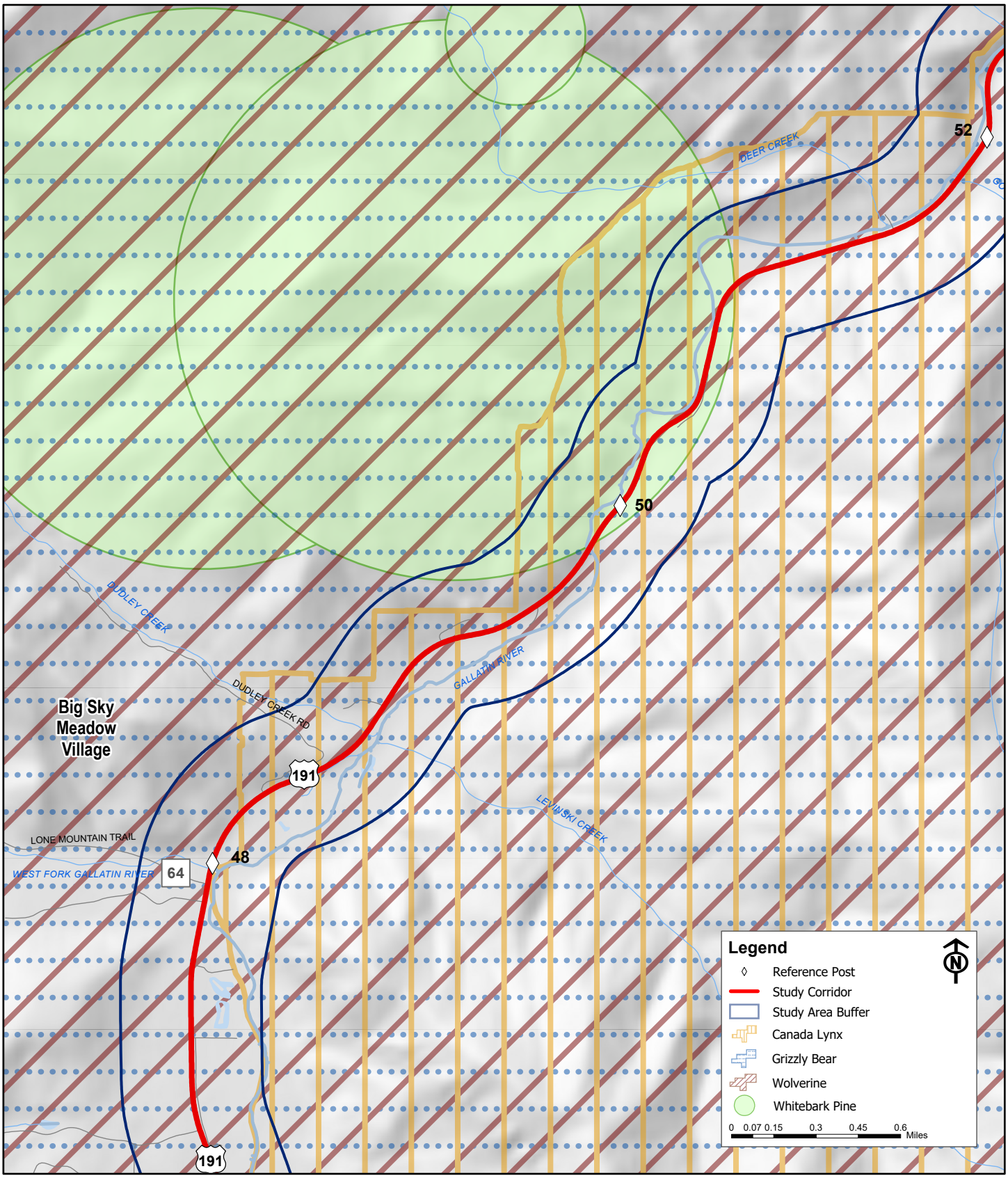





**Figure A.15: USFWS Threatened and Endangered Species**


52
DEER CREEK
50
DUDLEY CREEK
DUDLEY CREEK RD
GALLATIN RIVER
Big Sky
Meadow
Village
191
LEVINSKI CREEK
LONE MOUNTAIN TRAIL
48
WEST FORK GALLATIN RIVER
64
191
Legend
Reference Post
Study Corridor
Study Area Buffer
Canada Lynx
Grizzly Bear
Wolverine
Whitebark Pine
0 0.07 0.15 0.3 0.45 0.6
Miles

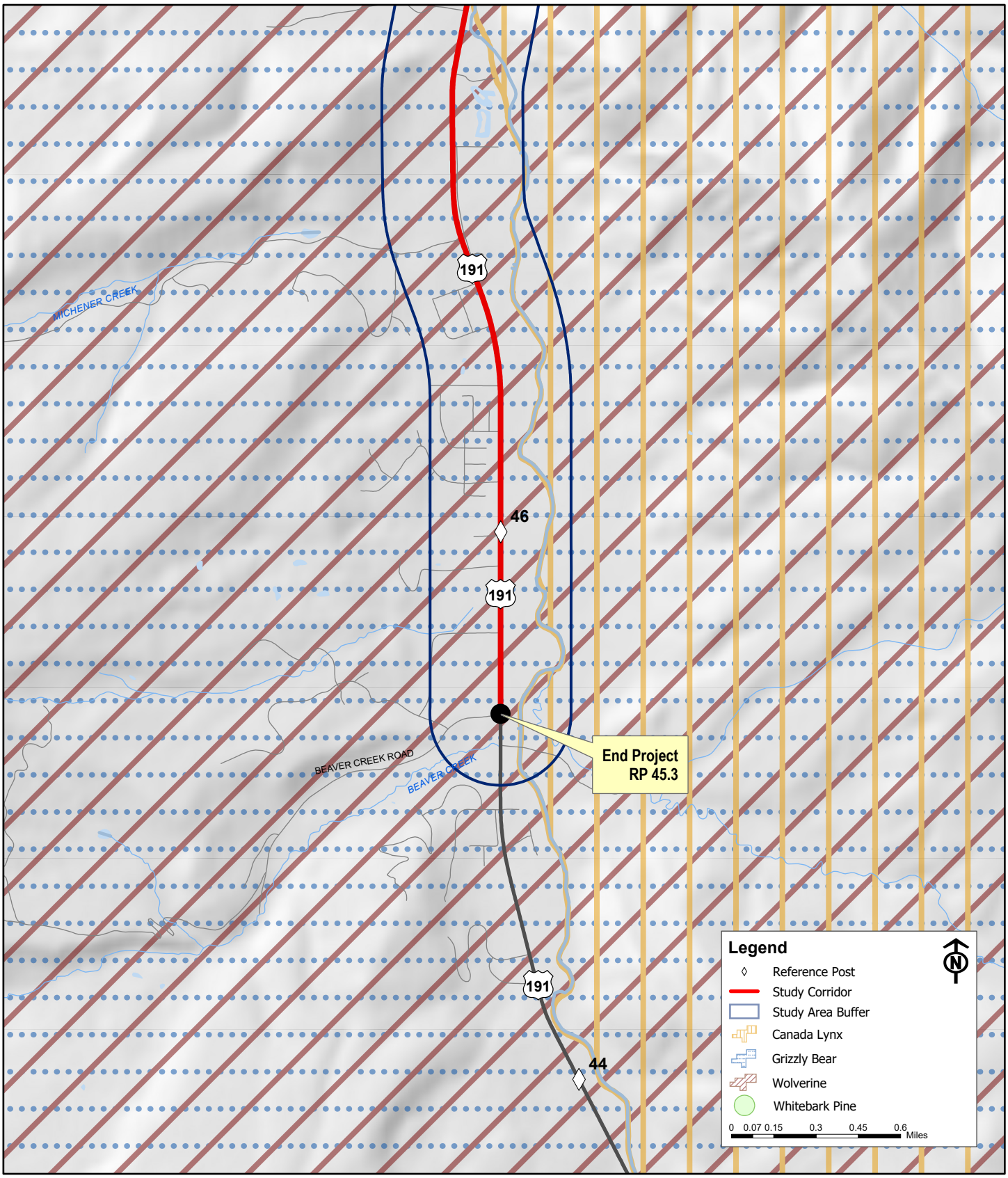





**Figure A.15: USFWS Threatened and Endangered Species**

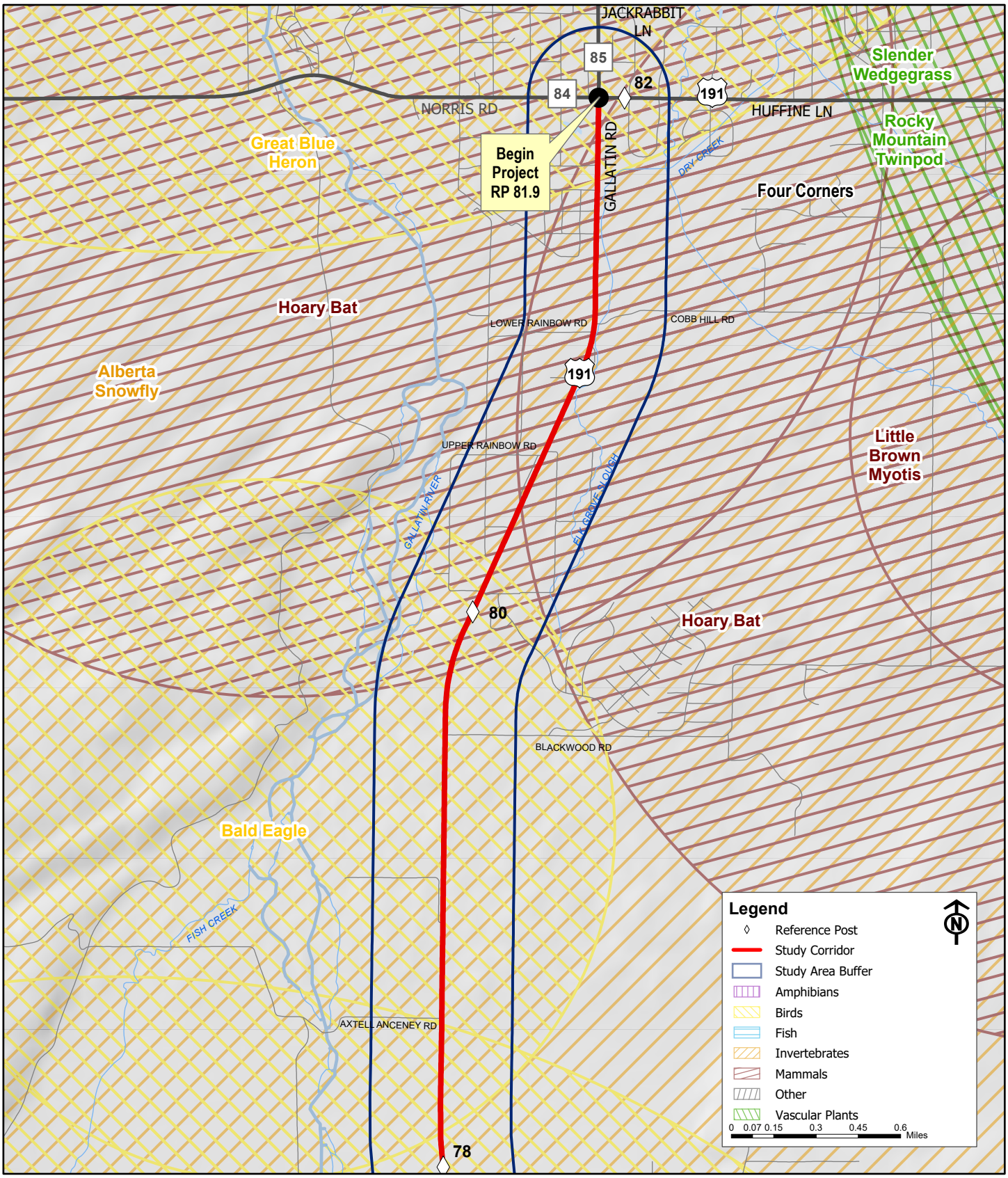





**Figure A.16: MTNHP Species of Concern**

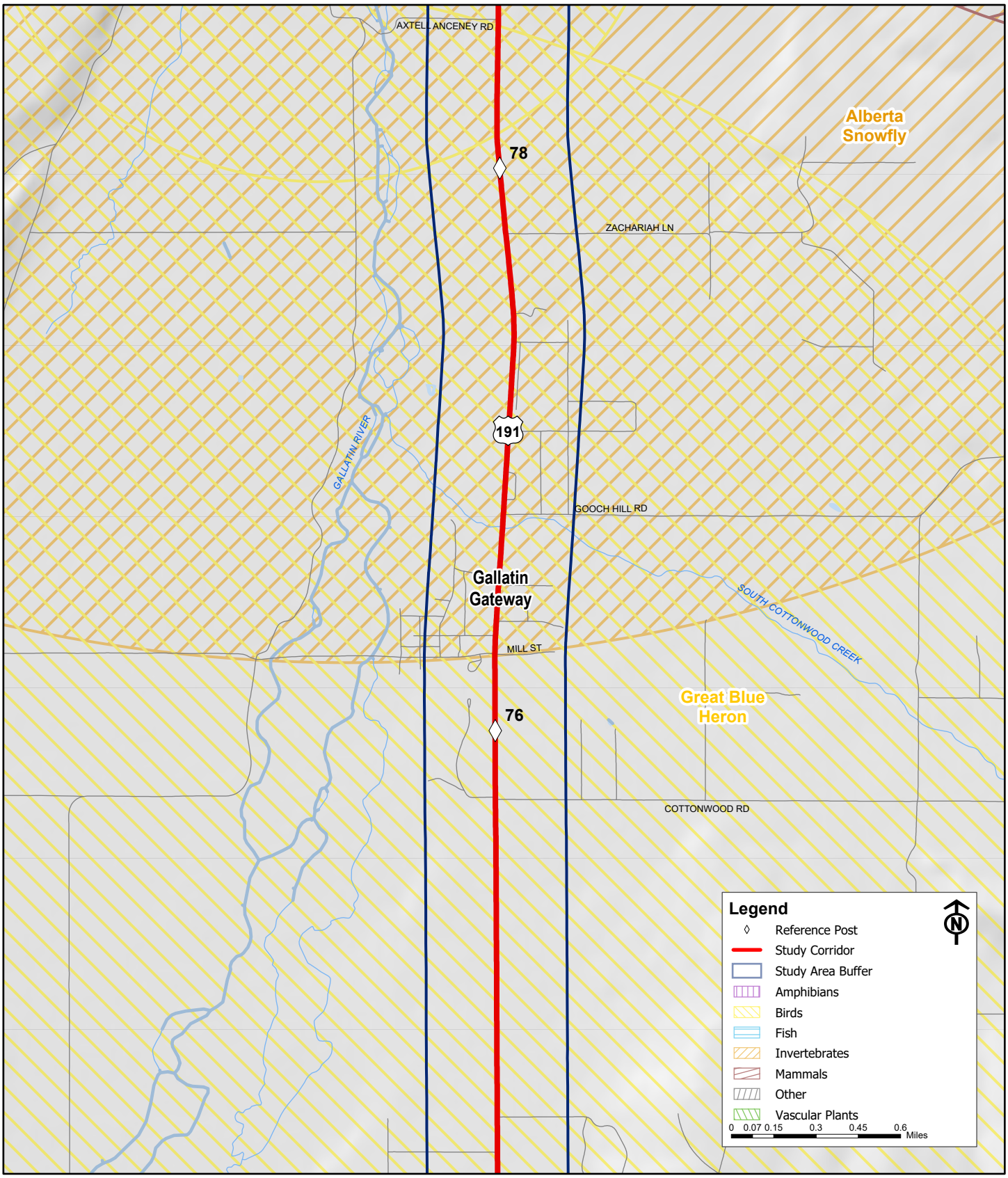



**Figure A.16: MTNHP Species of Concern**

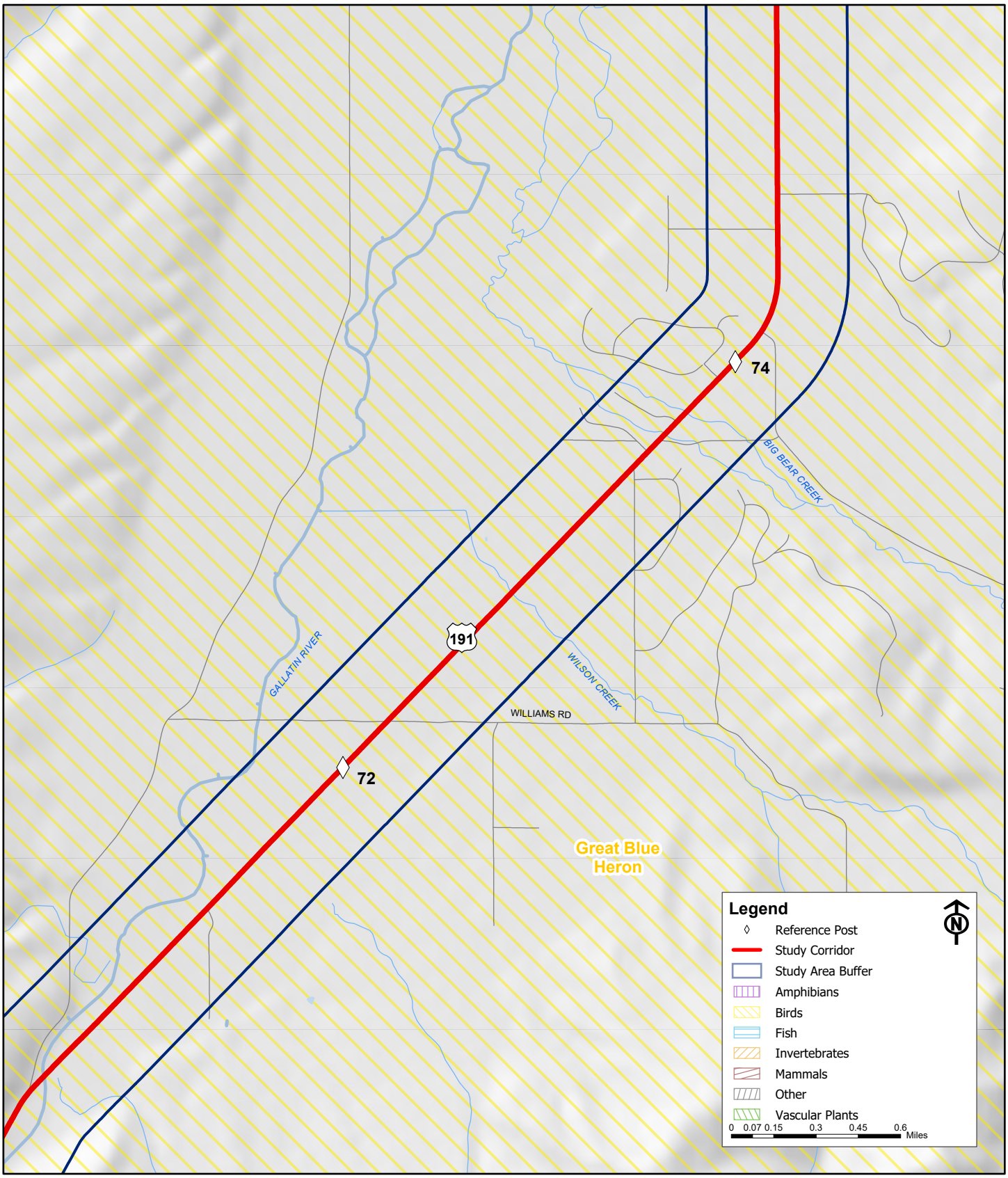





**Figure A.16: MTNHP Species of Concern**

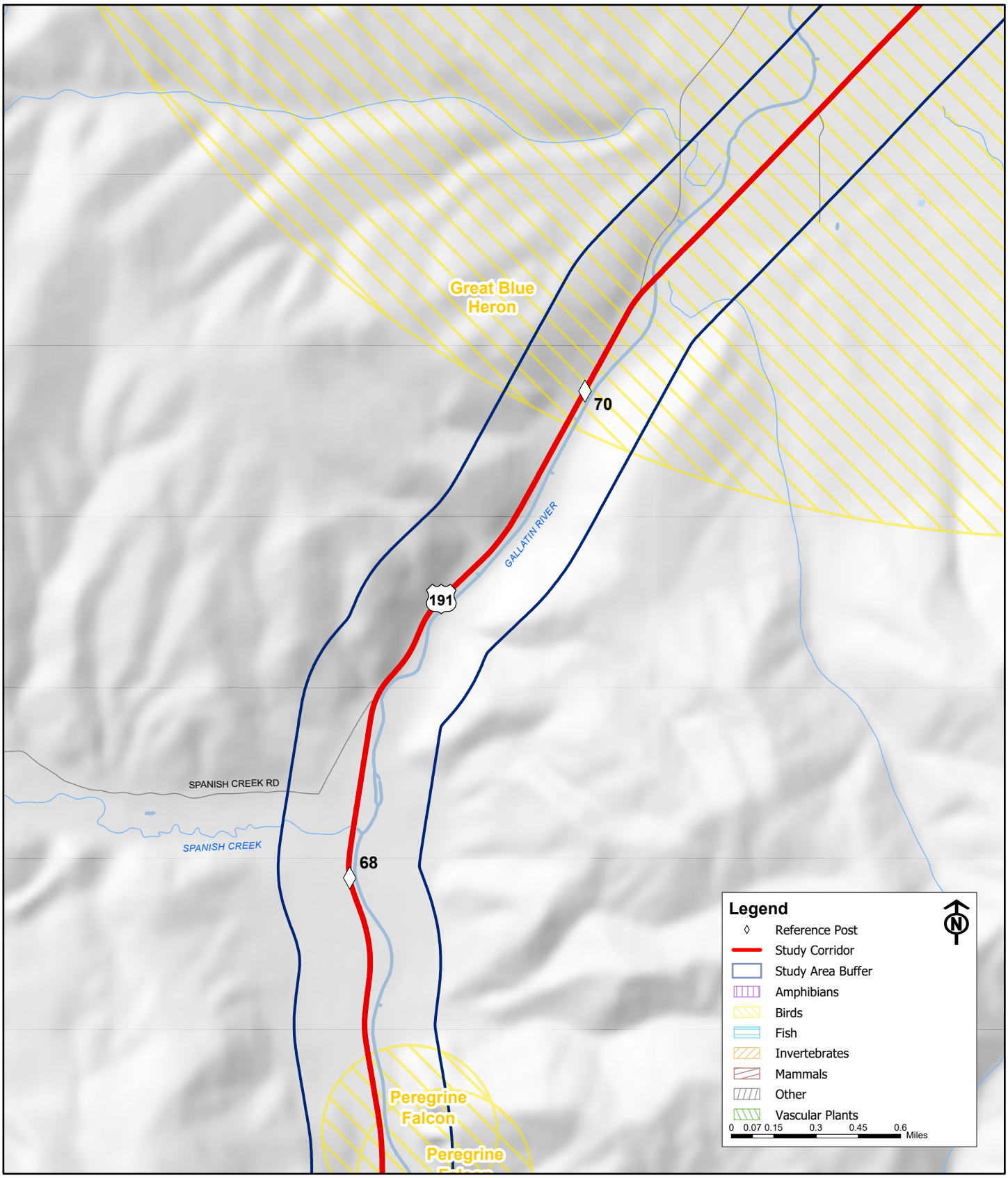





**Figure A.16: MTNHP Species of Concern**

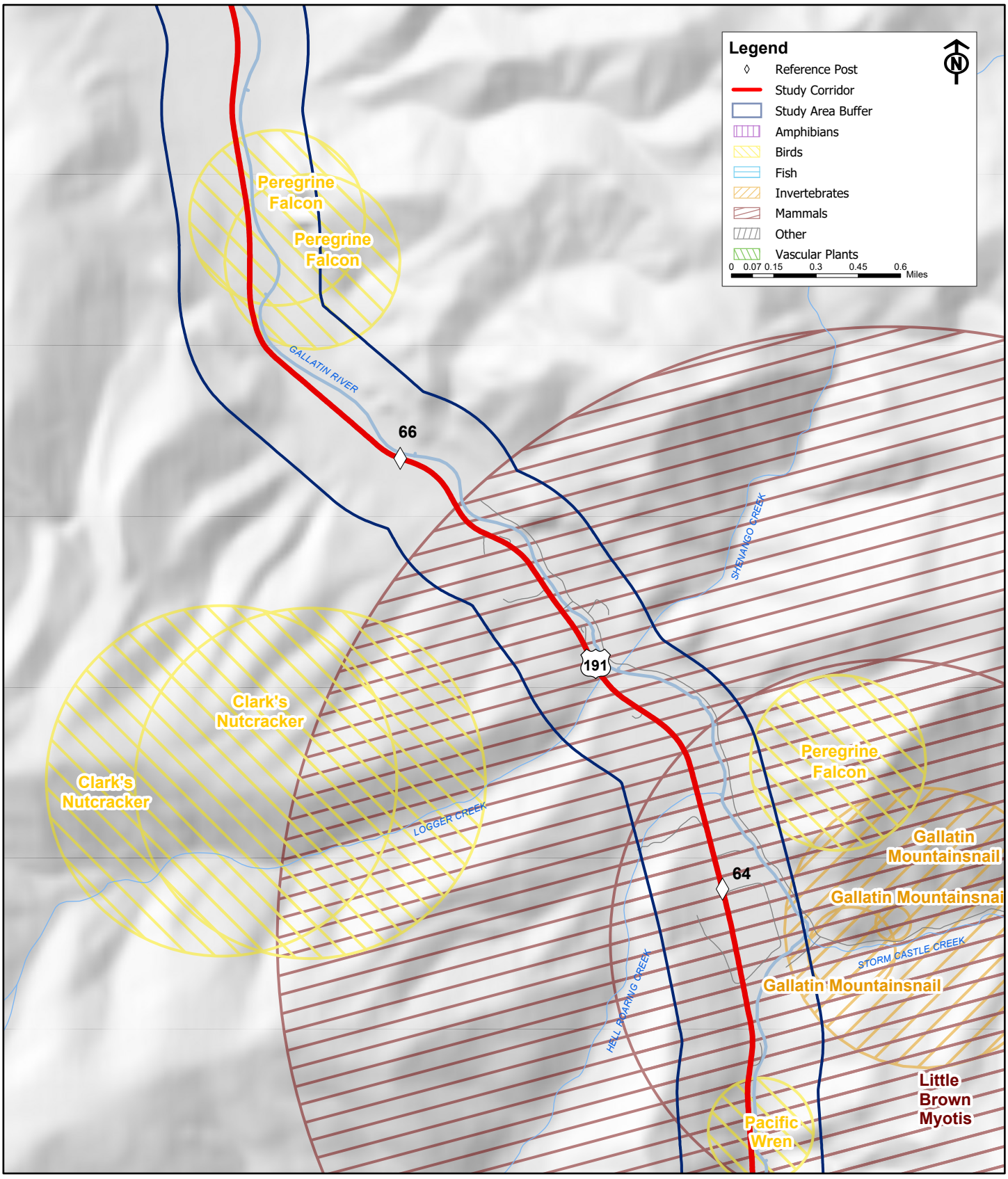



**Figure A.16: MTNHP Species of Concern**

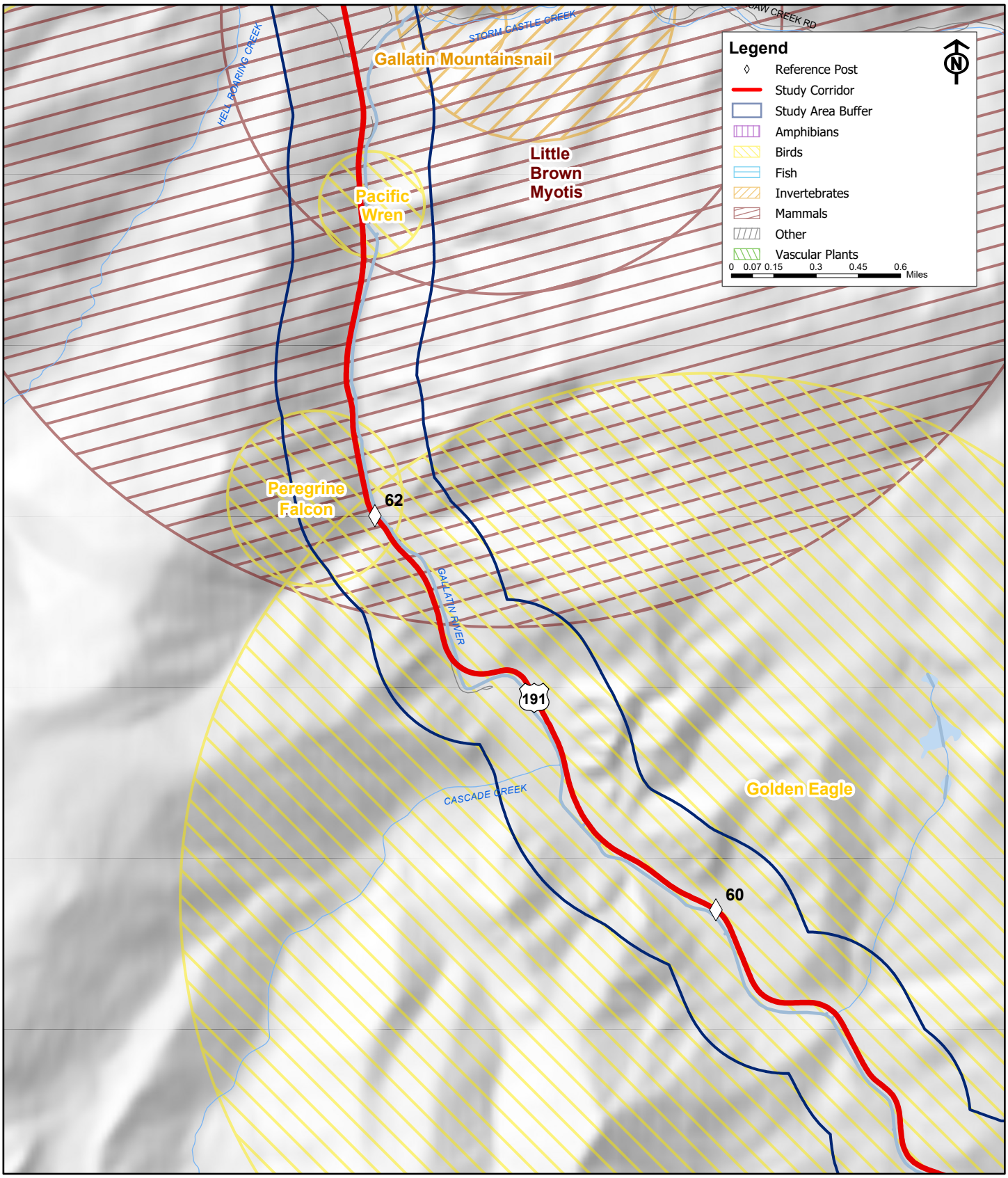



**Figure A.16: MTNHP Species of Concern**

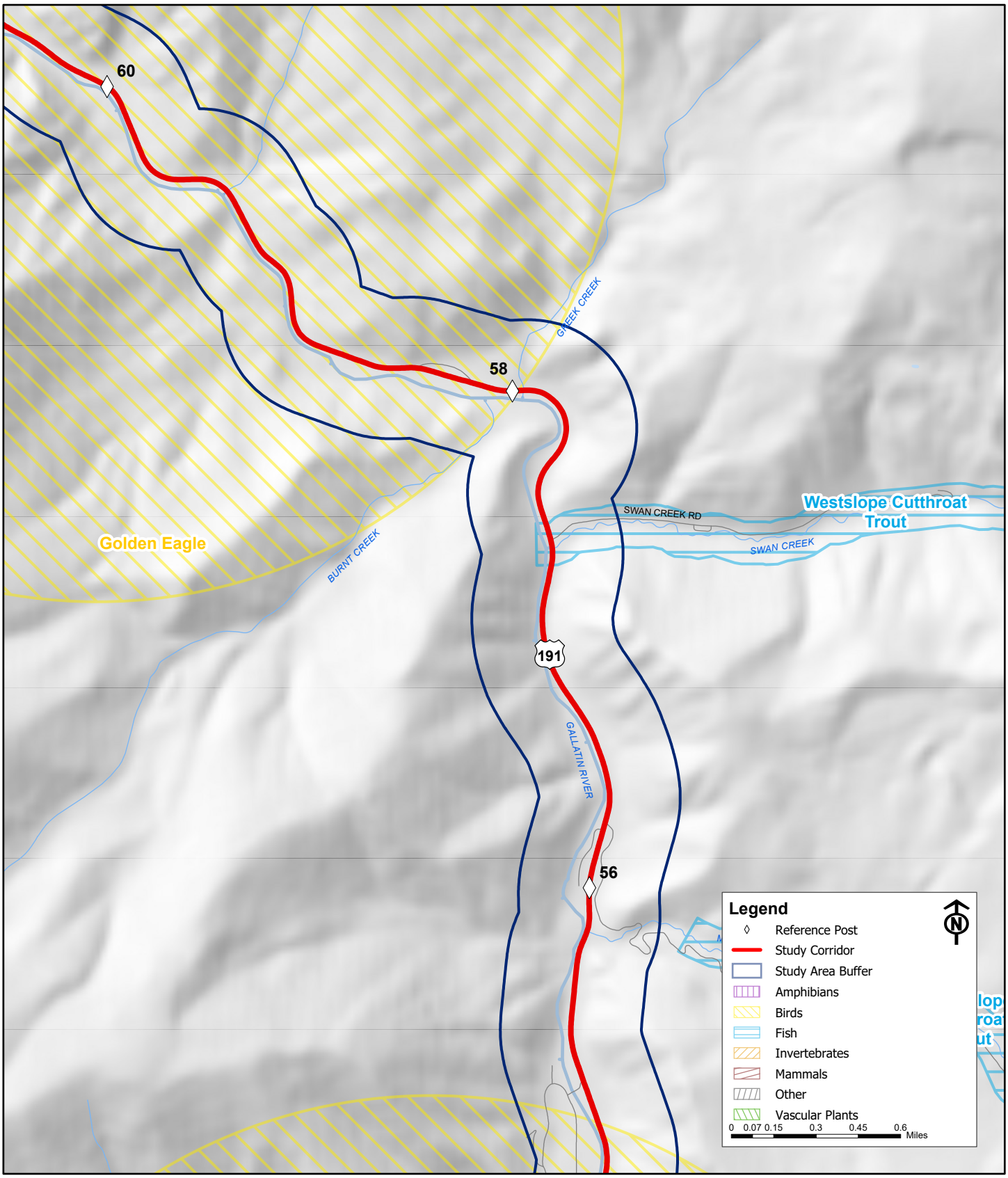



**Figure A.16: MTNHP Species of Concern**

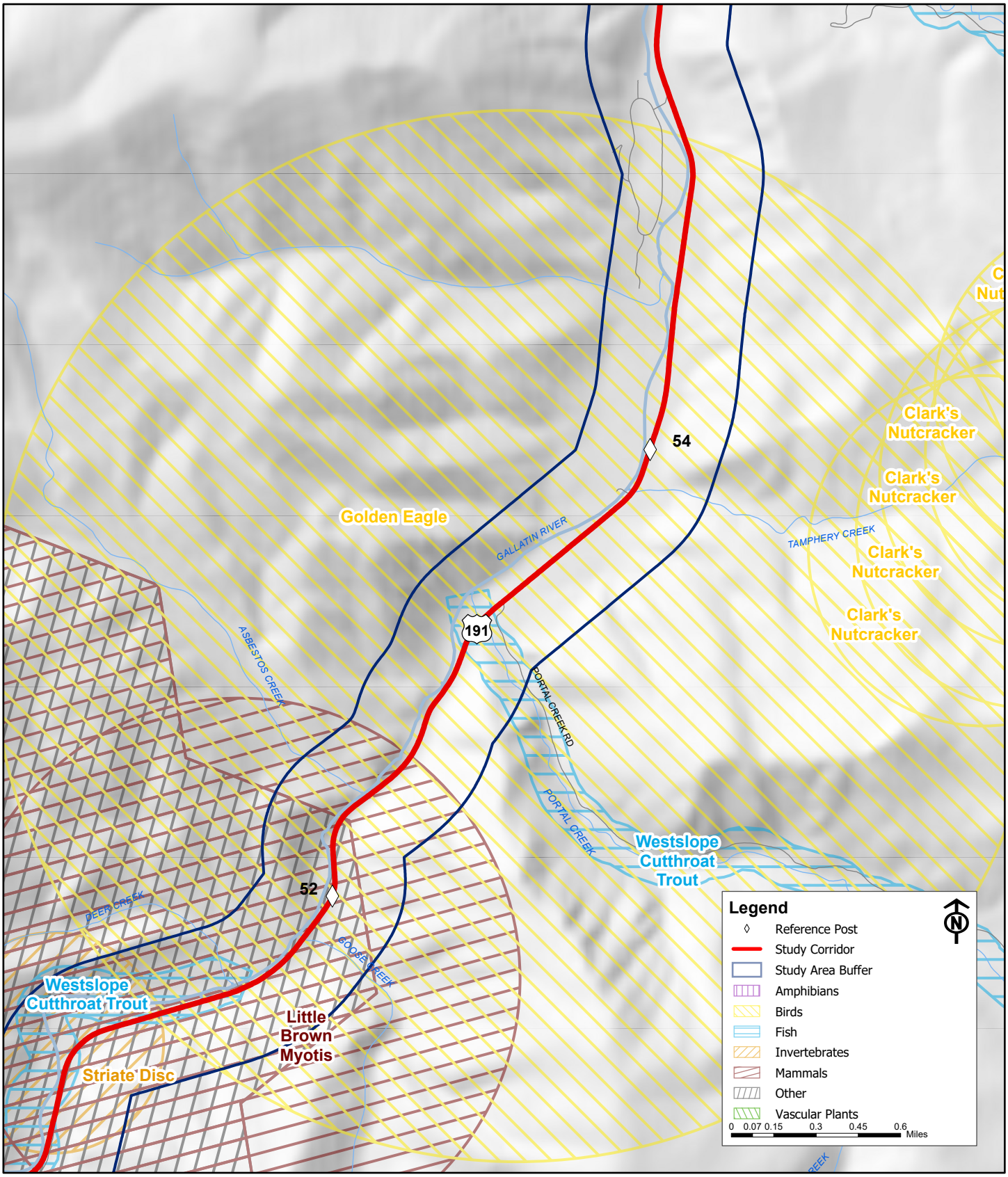
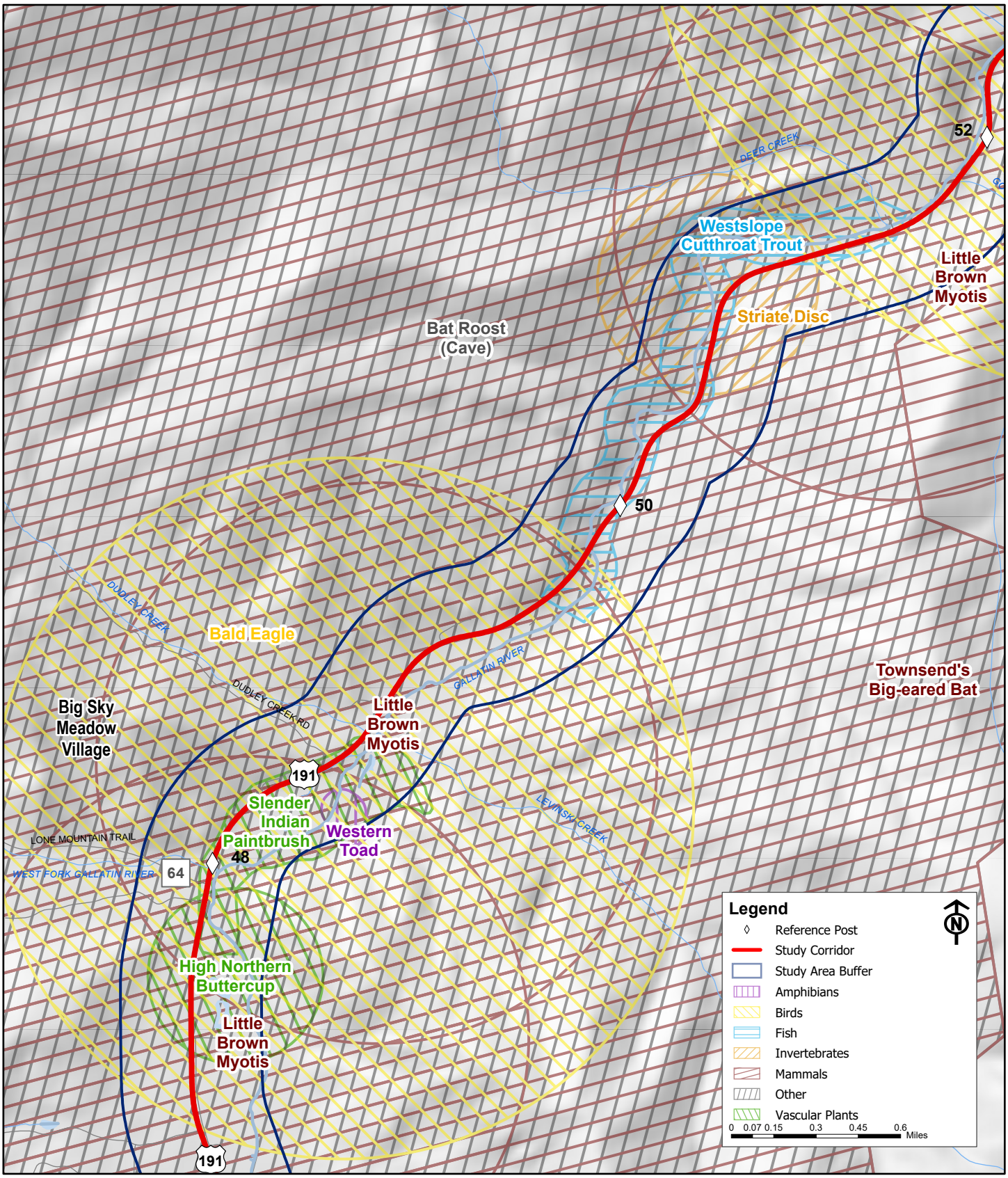



**Figure A.16: MTNHP Species of Concern**


52
DEER CREEK
Westslope Cutthroat Trout
Little Brown Myotis
Striate Disc
Bat Roost (Cave)
50
DUDLEY CREEK
Bald Eagle
DUDLEY CREEK RD
GALLATIN RIVER
Townsend's Big-eared Bat
Big Sky Meadow Village
Little Brown Myotis
191
Slender Indian Paintbrush
Western Toad
LEVINSKY CREEK
LONE MOUNTAIN TRAIL
48
WEST FORK GALLATIN RIVER
64
High Northern Buttercup
Little Brown Myotis
191
Legend
Reference Post
Study Corridor
Study Area Buffer
Amphibians
Birds
Fish
Invertebrates
Mammals
Other
Vascular Plants
0 0.07 0.15 0.3 0.45 0.6
Miles
N

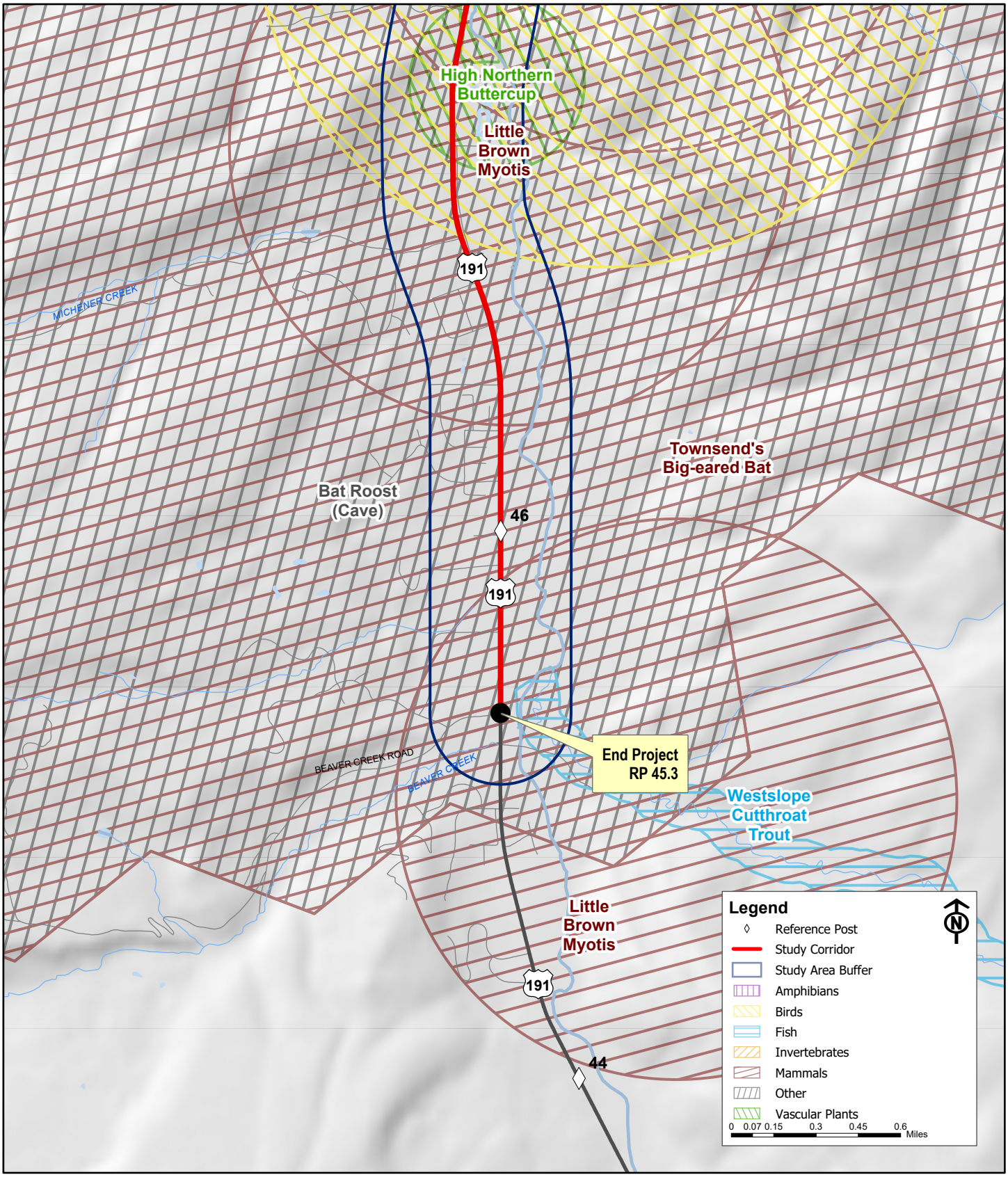



**Figure A.16: MTNHP Species of Concern**

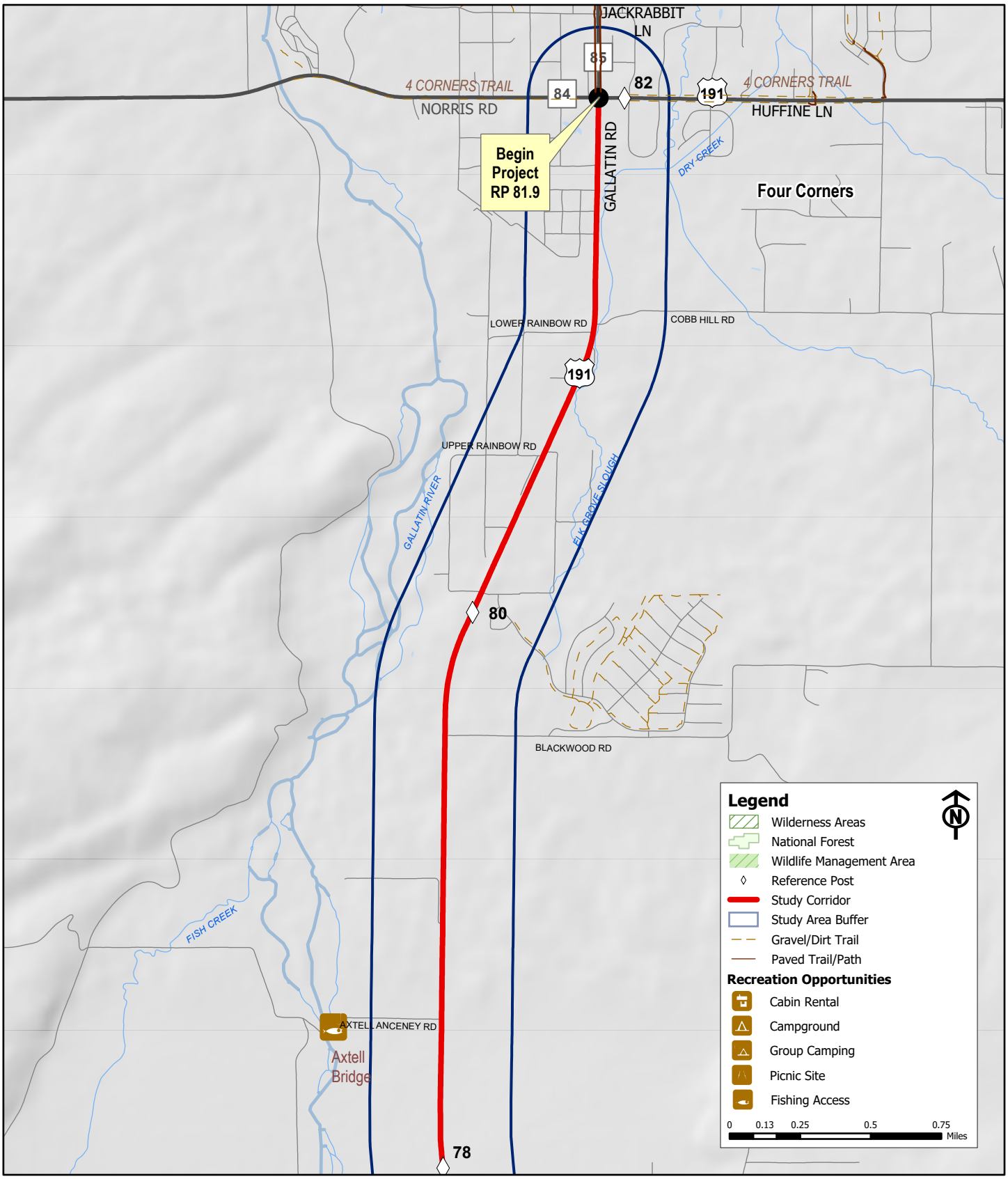



**Figure A.17: Recreation Opportunities**

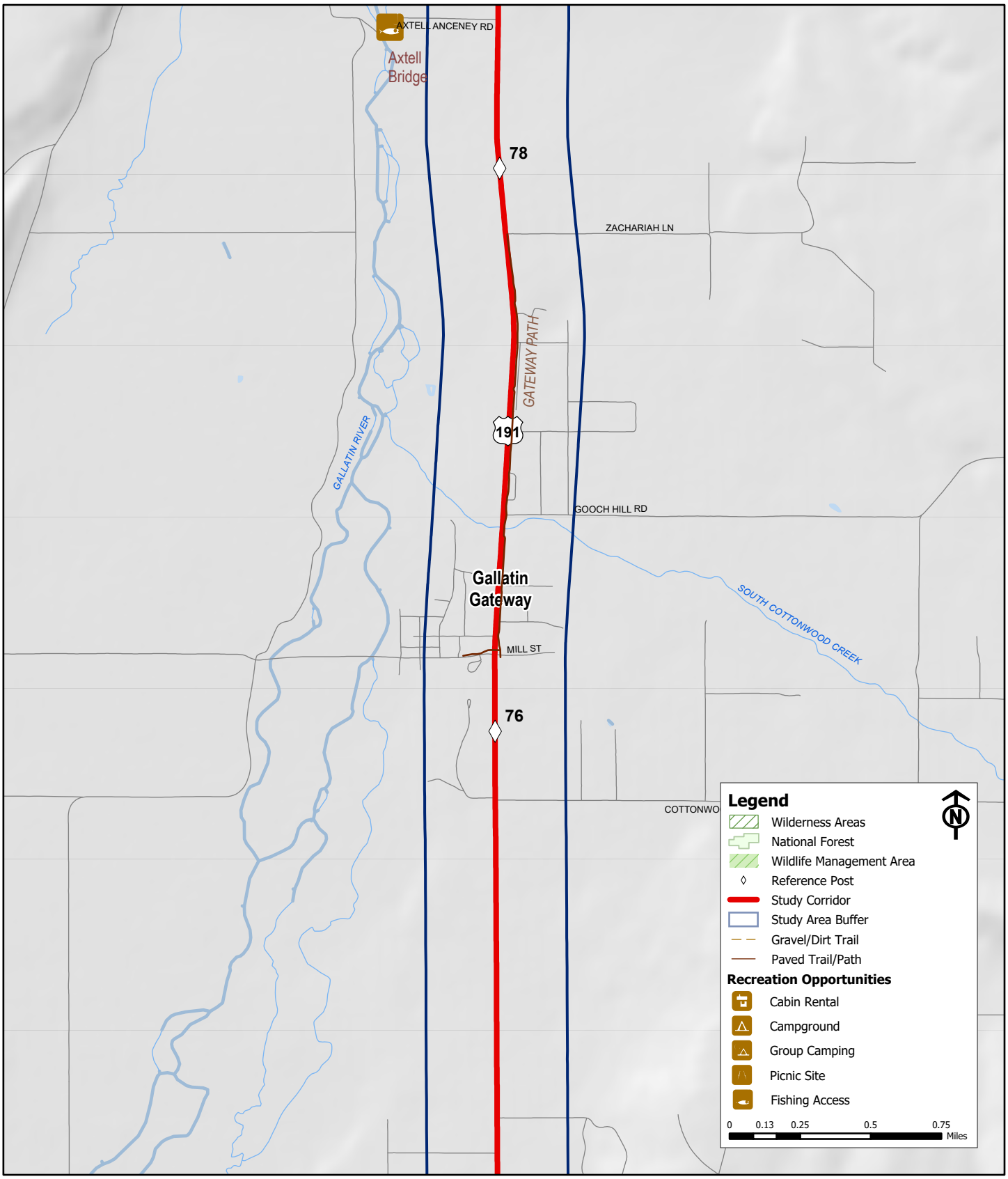



**Figure A.17: Recreation Opportunities**

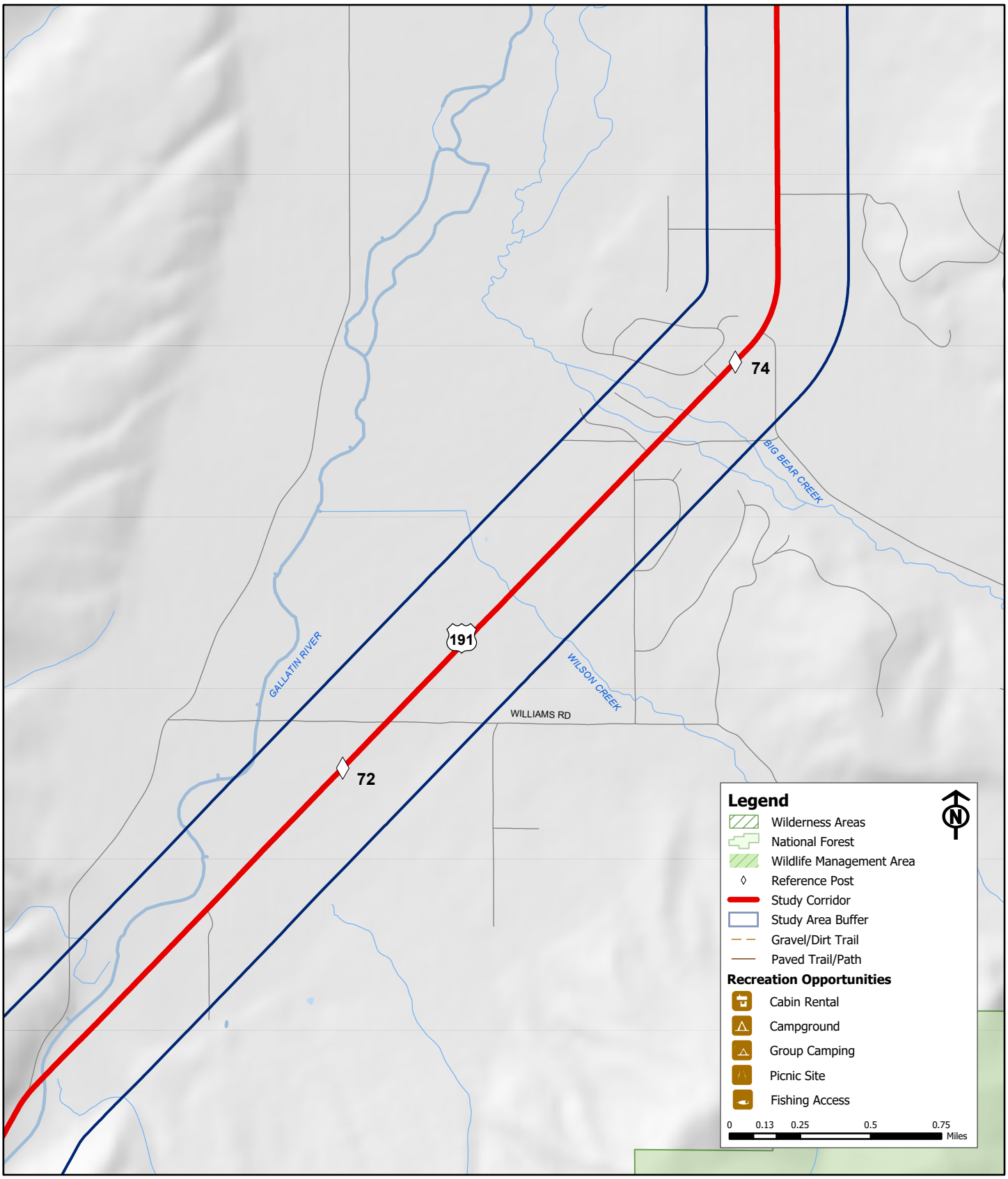
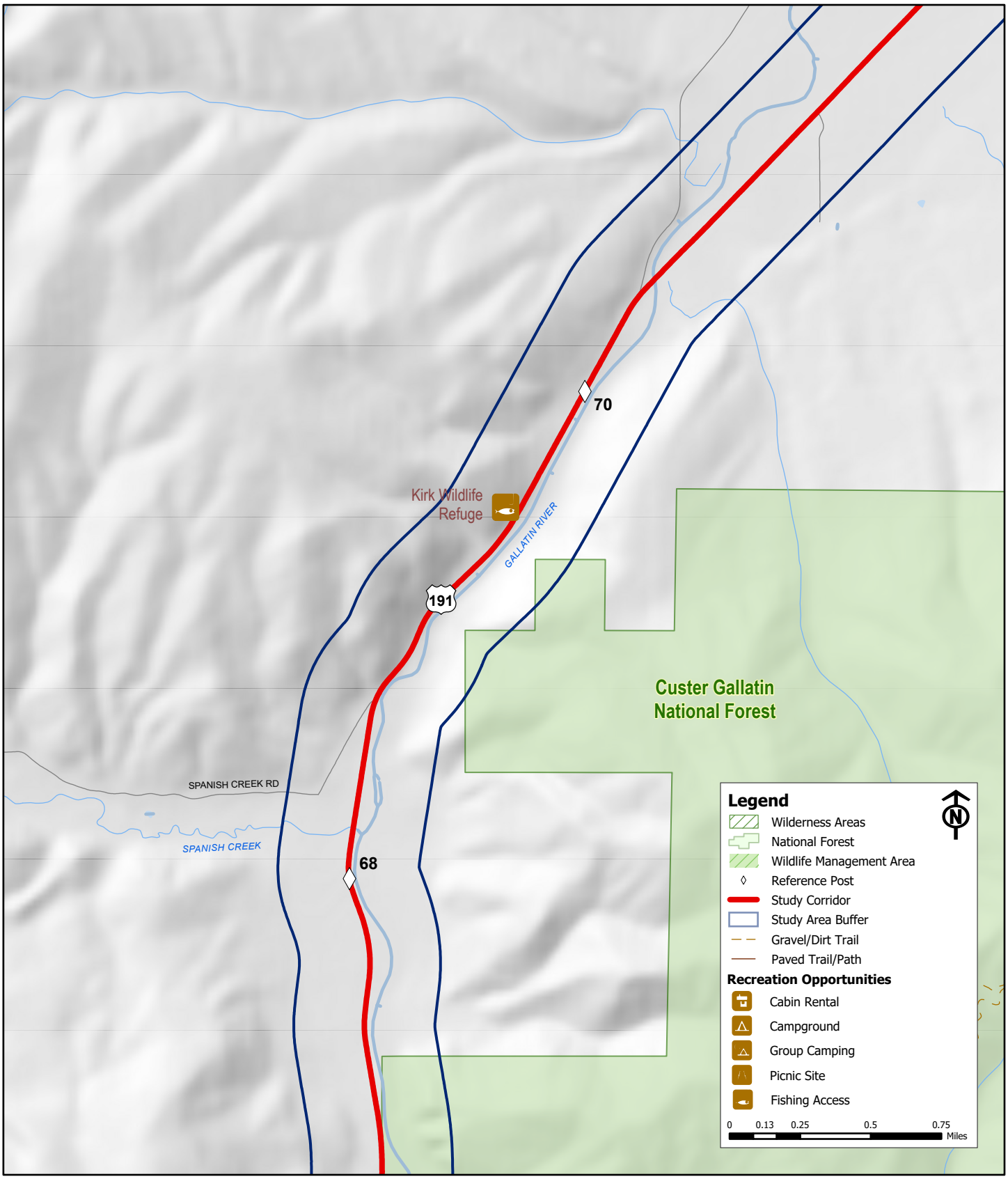





**Figure A.17: Recreation Opportunities**


70
Kirk Wildlife Refuge
GALLATIN RIVER
191
Custer Gallatin National Forest
SPANISH CREEK RD
SPANISH CREEK
68
Legend
Wilderness Areas
National Forest
Wildlife Management Area
Reference Post
Study Corridor
Study Area Buffer
Gravel/Dirt Trail
Paved Trail/Path
Recreation Opportunities
Cabin Rental
Campground
Group Camping
Picnic Site
Fishing Access
0 0.13 0.25 0.5 0.75
Miles
N

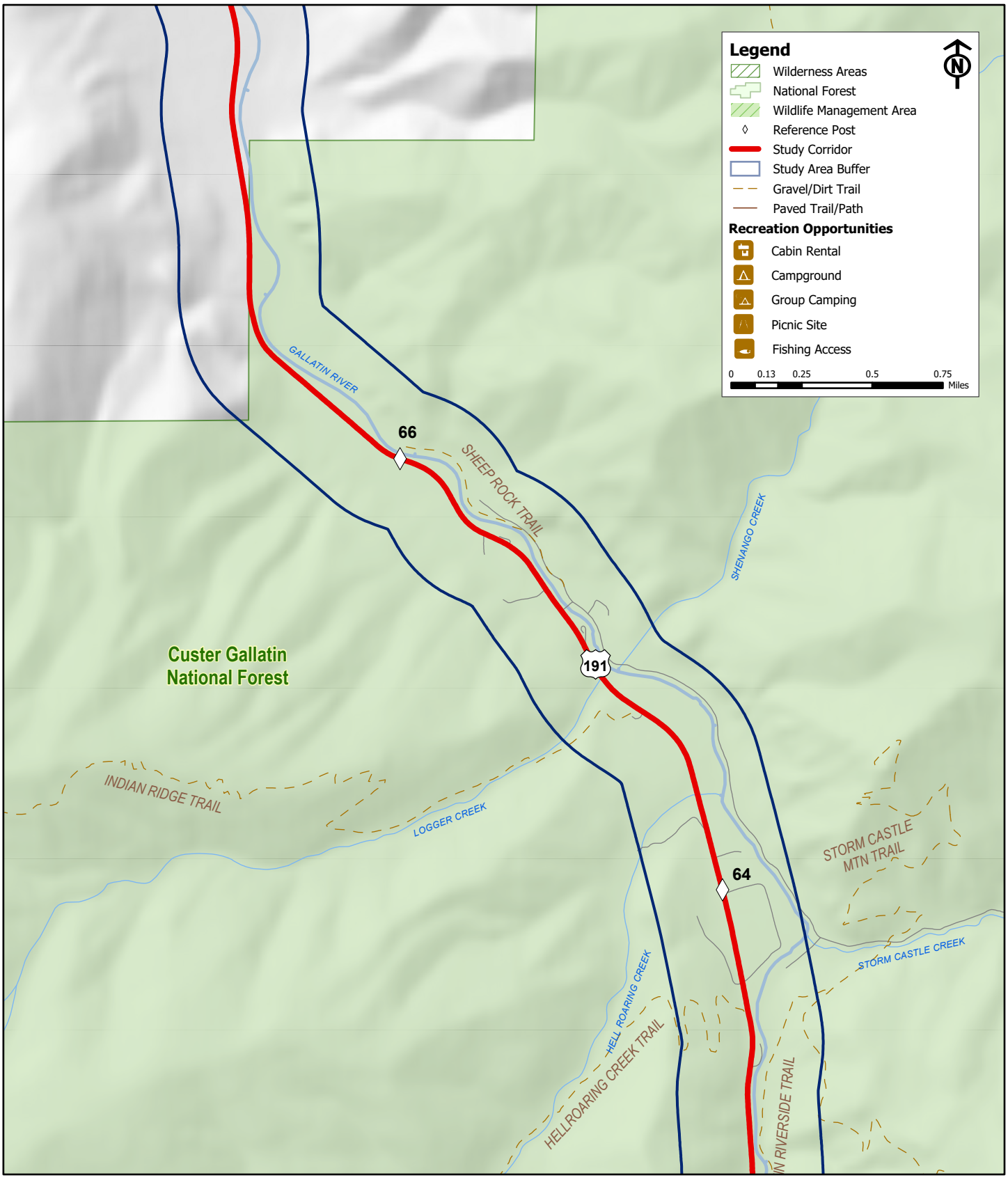





**Figure A.17: Recreation Opportunities**

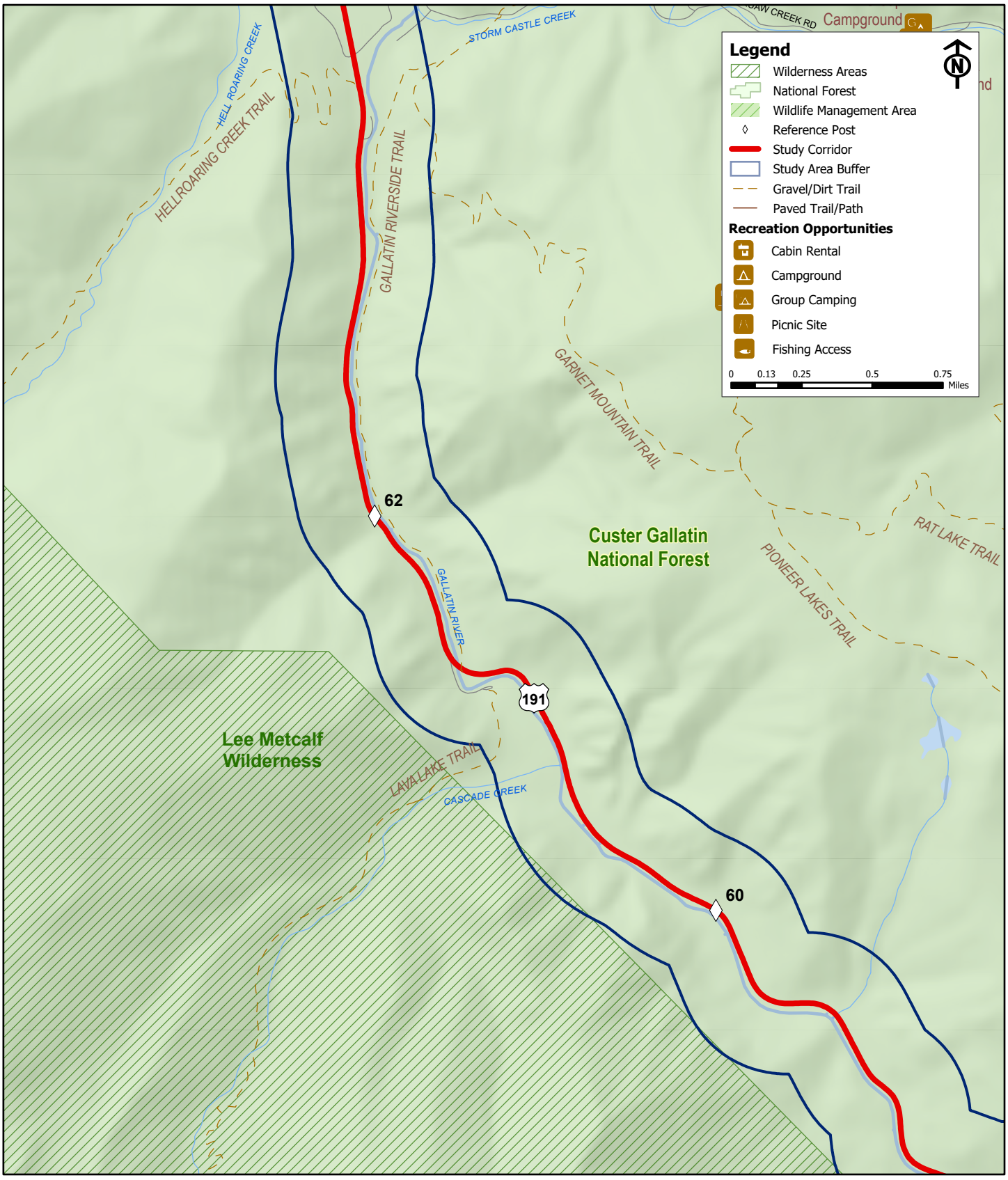



**Figure A.17: Recreation Opportunities**

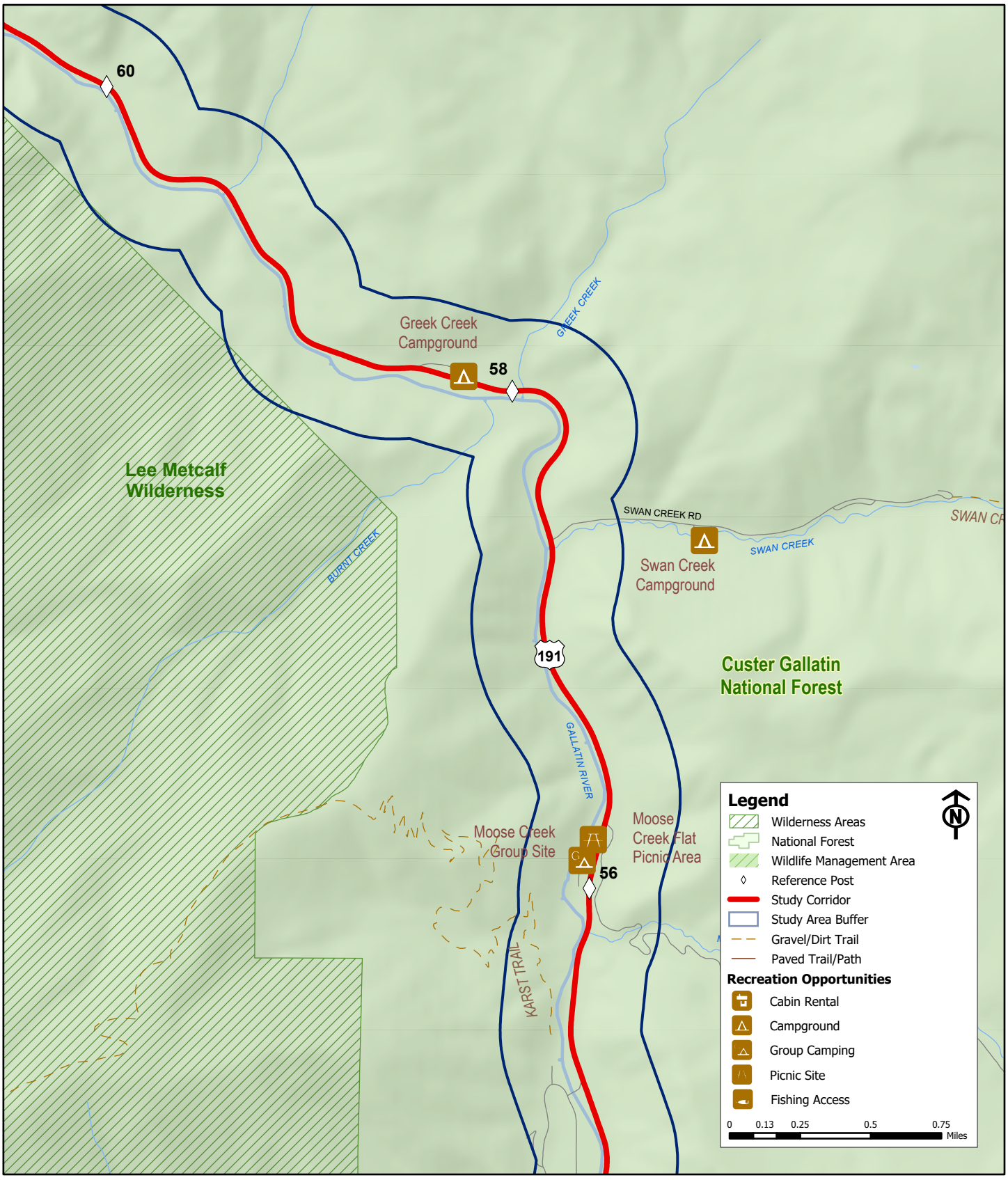



**Figure A.17: Recreation Opportunities**

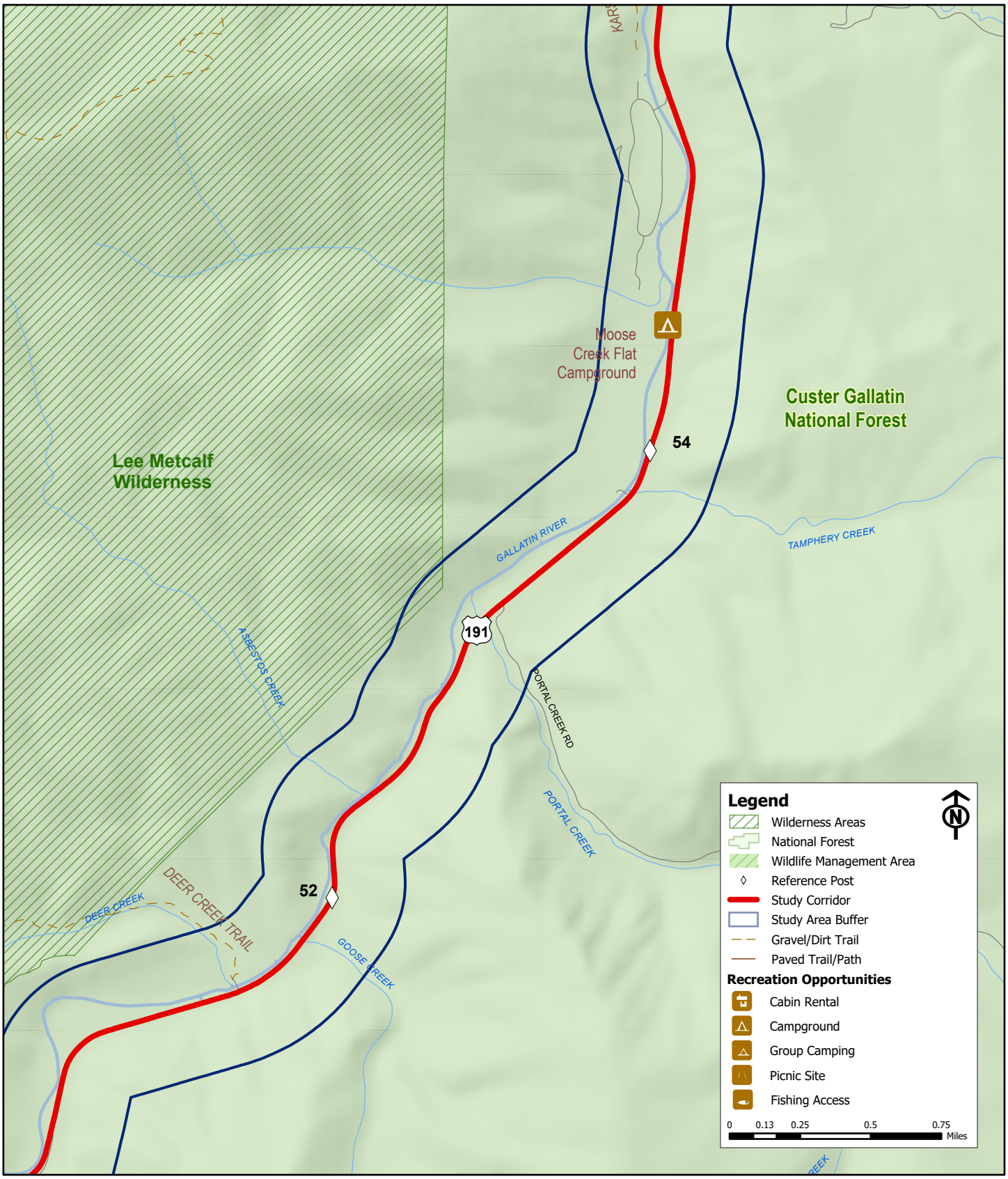



**Figure A.17: Recreation Opportunities**

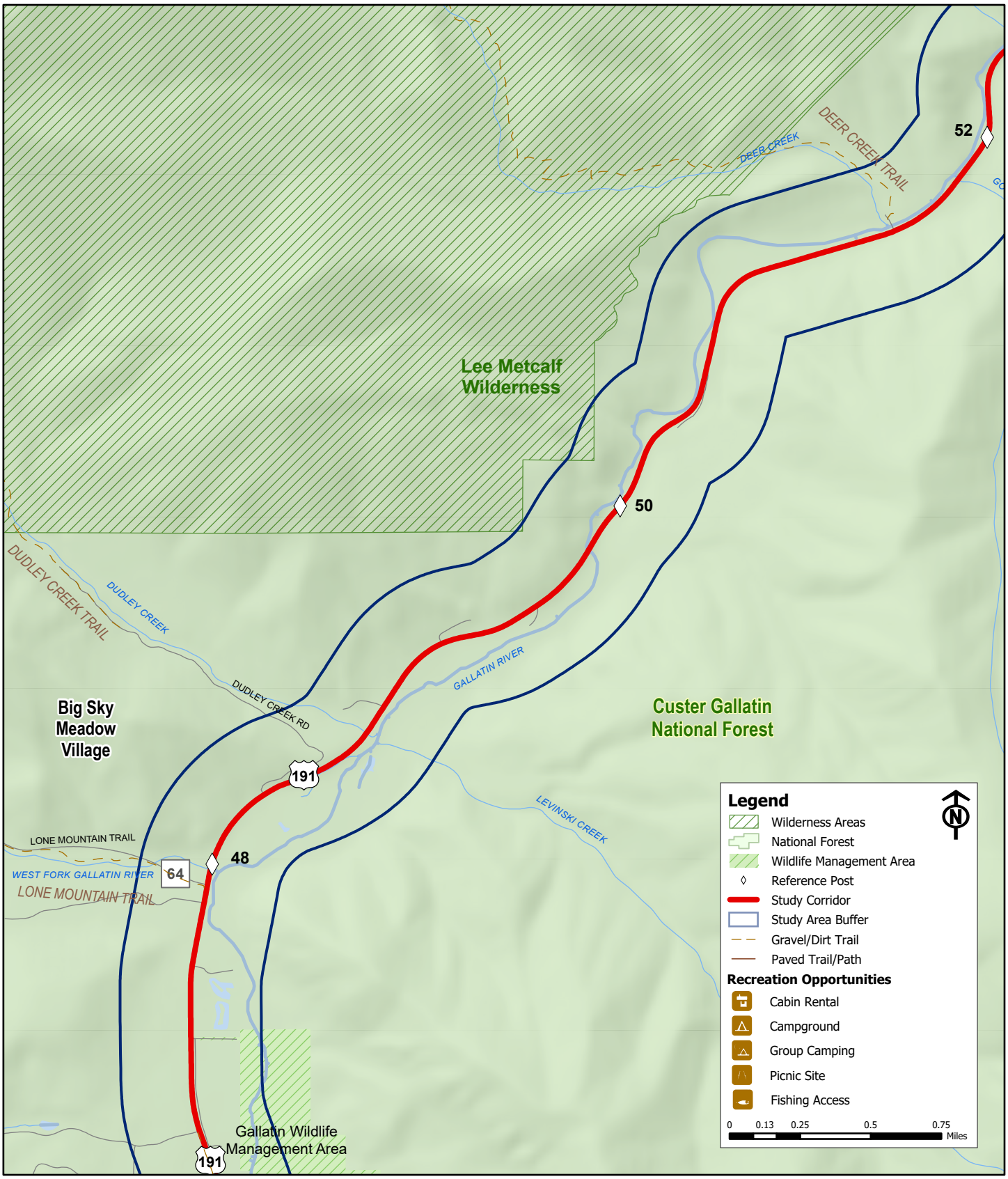





**Figure A.17: Recreation Opportunities**

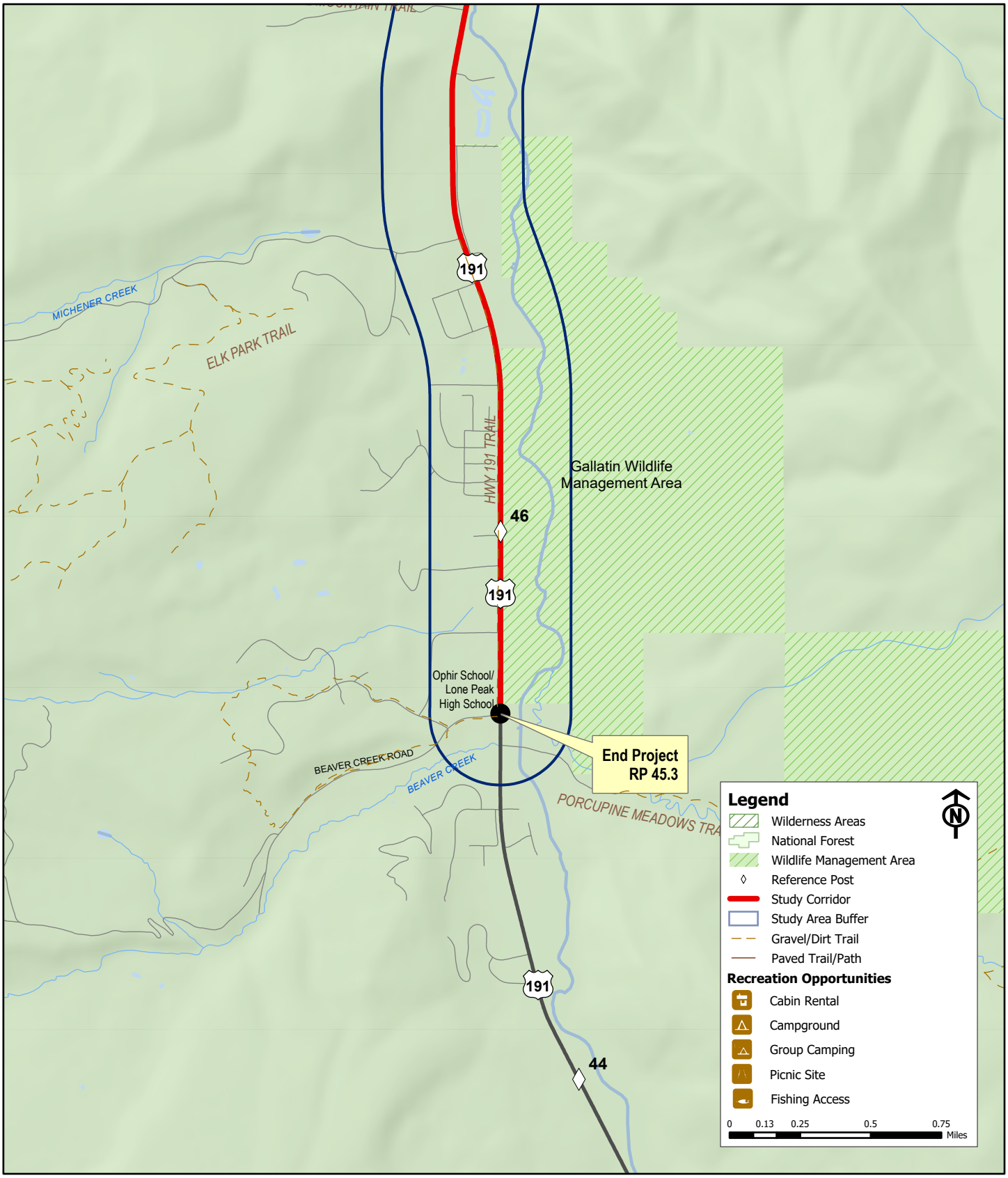





**Figure A.17: Recreation Opportunities**

US 191 Corridor Study
Four Corners to Beaver Creek

# Appendix B:

## *Expanded Tables*

## Table B.1: Water Quality and TMDL Status

| Stream | Water Quality Category/ Use Class | Beneficial Uses Supported | TMDL Completed | Possible Impairment | Impairment Source | Beneficial Uses Impacted |
|---|---|---|---|---|---|---|
| **Gallatin River** *Spanish Creek to mouth (Missouri River)* | 4C / B-1 | Drinking Water, Agricultural, Aquatic Life | N/A | Flow Regime Modification | Crop Production (irrigated) | Aquatic Life |
| **South Cottonwood Creek** *Middle Creek Assoc Ditch diversion to mouth (Gallatin River)* | 4C / B-1 | Drinking Water, Agricultural, Aquatic Life | N/A | Flow Regime Modification | Crop Production (irrigated) | Aquatic Life |
| **Gallatin River** *Yellowstone National Park Boundary to Spanish Creek* | 1 / B-1 | Drinking Water, Primary Contact Recreation, Agricultural, Aquatic Life | N/A | N/A | N/A | N/A |
| **Storm Castle Creek** *Headwaters to mouth (Gallatin River)* | 5 / B-1 | Primary Contact Recreation, Agricultural, Aquatic Life | N/A | Alteration in vegetative covers | Forest Roads, Silviculture Activities | Aquatic Life |
| | | | No | Phosphorus, Total | Natural Sources | Aquatic Life |
| | | | N/A | Physical substrate habitat alterations | Silviculture Activities, Forest Roads | Aquatic Life |
| **West Fork Gallatin River** *Confluence Middle and North Forks to mouth (Gallatin River)* | 5 / B-1 | Drinking Water, Primary Contact Recreation, Agricultural, Aquatic Life | N/A | Chlorophyll-a | On-site Treatment Systems, Site Clearance | Aquatic Life, Primary Contact Recreation |
| | | | Yes | Nitrate-Nitrite | On-site Treatment Systems, Site Clearance | Aquatic Life, Primary Contact Recreation |
| | | | Yes | Nitrogen, Total | On-site Treatment Systems, Site Clearance | Aquatic Life |
| | | | No | Phosphorus, Total | On-site Treatment Systems, Site Clearance | Aquatic Life |
| | | | Yes | Sedimentation-Siltation | Site Clearance | Aquatic Life |

## Table B.2: Hazardous Waste Release Sites / Remediation Response Sites

| Site | Name | Approx. RP | Contaminant | Program | Listed | Delisted |
|---|---|---|---|---|---|---|
| NWEB | NorthWestern Energy Non PCB Oil Release Bozeman | 79.5 | Non-PBC transformer/dielectric oil | WQA | 07/17/2004 | 12/06/2004 |
| CMCG | CMC Asbestos Gallatin Gateway | 77.0 | Asbestos | CERCA | 09/21/1990 | 12/21/1996 |
| HORK | Horkley Oil Inc | 71.0 | Diesel Spill | WQA | 10/18/1994 | 12/08/1995 |
| GALG | Gallatin Gateway Tanker Release | 70.4 | Gasoline Spill | WQA | 09/09/1991 | 09/20/1993 |
| IASG | Idaho Asphalt Supply | 59.0 | Asphalt & Diesel Spill | WQA | 01/10/1995 | 01/03/1996 |
| KARS | Karst Asbestos Mine | 56.0 | Asbestos | CERCLA, CERCA, FED | 08/01/1979 | 01/01/1984 |
| SISB | Southern Idaho Supply | 50.0 | Ammonium Nitrate | WQA | 02/02/1997 | 07/27/1998 |

## Table B.3: Underground Storage Tanks

| Facility ID | Facility Name | Approx. RP | Tank ID | Status | Substance |
|---|---|---|---|---|---|
| 1605064 | Thriftway Super Stop 8 | 82.0 | S1 | Permanently Out of Use | Heating Oil |
| | | | 02 | Permanently Out of Use | Gasoline |
| | | | 03 | Permanently Out of Use | Gasoline |
| | | | 04 | Permanently Out of Use | Gasoline |
| | | | 05 | Currently in Use | Gasoline |
| | | | 06 | Currently in Use | Gasoline |
| | | | 07 | Currently in Use | Diesel |
| 1606922 | Casey's Corner #1 | 82.0 | 01 | Permanently Out of Use | Gasoline |
| | | | 02 | Permanently Out of Use | Gasoline |
| | | | 03 | Permanently Out of Use | Gasoline |
| | | | 04 | Currently in Use | Gasoline |
| | | | 05 | Currently in Use | Gasoline |
| | | | 06 | Currently in Use | Gasoline |
| | | | 07 | Currently in Use | Diesel |
| | | | 08 | Currently in Use | Diesel |
| | | | 09 | Currently in Use | Diesel |
| | | | 10 | Currently in Use | Diesel |
| | | | 11 | Other | DEF (Not Regulated) |
| 6015119 | Town Pump Inc. Bozeman 5 | 82.0 | 01 | Currently in Use | Diesel |
| | | | 02 | Currently in Use | Diesel |
| | | | 03 | Currently in Use | Gasoline |
| | | | 04 | Currently in Use | Diesel |
| | | | 05 | Currently in Use | Gasoline |
| | | | 06 | Currently in Use | Gasoline |
| 1609998 | Casey's #9 | 76.2 | S1 | Permanently Out of Use | Gasoline |
| | | | S2 | Permanently Out of Use | Gasoline |
| | | | S3 | Permanently Out of Use | Diesel |
| | | | S4 | Permanently Out of Use | Diesel |
| | | | 05 | Currently in Use | Gasoline |
| | | | 06 | Currently in Use | Diesel |
| | | | 07 | Currently in Use | Diesel |
| | | | 08 | Currently in Use | Gasoline |

| Facility ID | Facility Name | Approx. RP | Tank ID | Status | Substance |
|---|---|---|---|---|---|
| | | | 09 | Currently in Use | Gasoline |
| | | | S10 | Permanently Out of Use | Hydraulic Fluid |
| 1603801 | Big Sky Conoco | 48.0 | 01 | Permanently Out of Use | Gasoline |
| | | | 02 | Permanently Out of Use | Gasoline |
| | | | 03 | Permanently Out of Use | Gasoline |
| | | | S4 | Permanently Out of Use | Heating Oil |
| | | | 05 | Permanently Out of Use | Waste Oil |
| | | | 06 | Currently in Use | Gasoline |
| | | | 07 | Currently in Use | Gasoline |
| | | | S8 | Temporarily Out of Use | Diesel |
| | | | 09 | Currently in Use | Diesel |
| 1606923 | Casey's #6 | 47.6 | 01 | Currently in Use | Gasoline |
| | | | 02 | Currently in Use | Gasoline |
| | | | 03 | Currently in Use | Diesel |

### Table B.4: Petroleum Tank Releases

| Facility ID | Facility Name | Approx. RP | Eligible Status | Application Received | Ratified Date | Resolved Date |
|---|---|---|---|---|---|---|
| 1605064 | Thriftway Super Stop 8 | 82.0 | Eligible | 01/28/1999 | 11/22/1999 | 06/05/2002 |
| 5614002 | Buffalo Station | 75.8 | Eligible | 02/28/2007 | 04/02/2007 | 10/23/2007 |
| 1603427 | Elkhorn Ranch | 71.7 | Eligible | 01/31/1996 | 02/23/1996 | 12/17/1999 |
| 1606923 | Jaspers Big Sky Exxon | 47.6 | Eligible | 09/25/1998 | 01/19/1999 | 11/08/1999 |
| 9995003 | Frontier Construction | 47.4 | Eligible | 04/19/2005 | 05/23/2005 | 01/03/2013 |

### Table B.5: Abandoned and Inactive Mine Sites

| Site Name | Approx. RP | Commodity | Operation Type | Development Status |
|---|---|---|---|---|
| Bozeman Hot Springs | 81.3 | Geothermal | Geothermal | Producer |
| Spanish Creek Resource Study | 68.2 | Gold, Titanium | Placer | Prospect |
| Deer Creek Prospect | 51.3 | Copper, Nickle | Unknown | Occurrence |
| Unnamed Location | 49.8 | Copper | Surface | Occurrence |

### Table B.6: Open Cut Permits

| Opencut Number | Site Name | Approx. RP | Site Status | Operator |
|---|---|---|---|---|
| 2866 | Simpson | 81.0 | Pre-Application Request | Tom Duffy |
| 1737 | Morgan Family LLC | 78.0 | Permitted | TMC Inc. |
| 2520 | Gateway Pit | 76.0 | Voided | Gateway Village LLC |
| 2815 | Ponderosa | 47.7 | Permitted | Kenyon Noble Ready Mix |
| 618 | Big Sky Pit | 47.6 | Released | Portable Inc. |
| 1414 | Section 5 North | 47.4 | Released | Knife River – Belgrade |
| 2861 | Section 5 North | 47.4 | Pending | Scott and Pamela Altman |
| 3023 | Section 5 North | 47.4 | Permitted | TMC Inc. |

## Table B.7: Previously Recorded Historic Sites in the General Study Area

| Site Number | Section | Site Type | Ownership | NRHP Status |
|---|---|---|---|---|
| **Township 2 South Range 4 East** | | | | |
| 24GA0311 | 13, 24 | Prehistoric, Buffalo Jump | No Data | Undetermined |
| 24GA0335 | 13 | Historic Residence & Outbuildings | Private | Eligible |
| 24GA0742 | 11, 14 | Historic Irrigation System | Private | Eligible |
| 24GA0915* | 11, 13, 14, 23, 26, 35 | Historic Railroad | Private | Eligible |
| 24GA0982 | 11, 12, 13, 14 | Historic Irrigation System | Private | Eligible |
| 24GA0998* | 24, 35 | Historic Irrigation System | Private | Eligible |
| 24GA1507 | 12, 13 | Historic Vehicular/Foot Bridge | MDT | Undetermined |
| 24GA1591 | 11 | Historic Homestead/Farmstead | Private | Undetermined |
| 24GA1626 | 14 | Historic Homestead/Farmstead | Private | Undetermined |
| 24GA1627 | 12, 13, 14, 23 | Historic Irrigation System | Private | Eligible |
| 24GA1628 | 14 | Historic Commercial Development | Private | Undetermined |
| 24GA1676 | 35 | Historic Vehicular/Foot Bridge | Other | Eligible |
| 24GA1764 | 14, 23 | Historic Irrigation System | Private | Undetermined |
| 24GA1781 | 11, 13, 14 | Historic Irrigation System | Private | Eligible |
| 24GA1786 | 14, 23 | Historic Irrigation System | Private | Undetermined |
| **Township 3 South Range 4 East** | | | | |
| 24GA0746 | 11 | Historic Hotel/Motel | Private | NR Listed |
| 24GA0791 | 26 | Historic Education | Private | NR Listed |
| 24GA0915* | 2, 11 | Historic Railroad | Private | Eligible |
| 24GA0998* | 2, 11 | Historic Irrigation System | Private | Eligible |
| 24GA1078 | 33 | Lithic Material Concentration | Private | Undetermined |
| 24GA1964* | 23, 26, 27, 33, 34 | Historic Irrigation System | Private | Undetermined |
| 24MA0257 | 14, 27, 33, 34 | Historic Railroad, Stage Route, Travel | Combination | Eligible |
| **Township 4 South Range 4 East** | | | | |
| 24GA0389 | 33 | Historic Irrigation System | Forest Service | Undetermined |
| 24GA0788 | 28 | Historic Ranger Station | Forest Service | Eligible |
| 24GA1042 | 18 | Lithic Material Concentration & Historic Homestead/Farmstead | Private | Undetermined |
| 24GA1043 | 7, 18 | Lithic Material Concentration | Private | Undetermined |
| 24GA1044 | 18 | Lithic Material Concentration | Private | Undetermined |
| 24GA1045 | 18 | Lithic Material Concentration | Private | Undetermined |
| 24GA1046 | 18 | Lithic Material Concentration | Private | Undetermined |
| 24GA1047 | 18 | Lithic Material Concentration | Private | Undetermined |
| 24GA1048 | 19 | Lithic Material Concentration | Private | Undetermined |
| 24GA1052 | 18 | Lithic Material Concentration | Private | Undetermined |
| 24GA1064 | 18 | Lithic Material Concentration | State Owned | Undetermined |
| 24GA1071 | 18 | Historic Vehicular/Foot Bridge | Private | Undetermined |
| 24GA1076 | 18 | Lithic Material Concentration | Private | Undetermined |
| 24GA1528 | 20 | Lithic Material Concentration | No Data | Undetermined |
| 24GA1964* | 4, 5 | Historic Irrigation System | Private | Undetermined |
| **Township 5 South Range 4 East** | | | | |
| 24GA0102 | 15 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA0103 | 25 | Lithic Material Concentration | Forest Service | Eligible |
| 24GA0312 | 24 | Lithic Material Concentration | Forest Service | Undetermined |

| Site Number | Section | Site Type | Ownership | NRHP Status |
|---|---|---|---|---|
| 24GA0317 | 36 | Lithic Material Concentration | MDT/Other | Eligible |
| 24GA0661 | 36 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA0690 | 25 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA1034 | 15 | Historic Recreation/Tourism | Forest Service | Undetermined |
| 24GA1035 | 15 | Historic Residence | Forest Service | Undetermined |
| 24GA1093 | 15, 16 | Historic Road/Trail | Forest Service | Undetermined |
| 24GA1135 | 15 | Historic Residence | Private | Undetermined |
| 24GA1199 | 16 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA1203 | 36 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA1508 | 25 | Historic Vehicular/Foot Bridge | MDT | Undetermined |
| 24GA1783 | 36 | Historic Mining | Forest Service | Eligible |
| **Township 6 South Range 4 East** | | | | |
| 24GA0318 | 32 | Lithic Material Concentration | No Data | Undetermined |
| 24GA0320 | 13 | Other | MDT/Other | Undetermined |
| 24GA0454 | 33 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA0689 | 32 | Lithic Material Concentration | Private | Undetermined |
| 24GA0874 | 23 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA0877 | 12 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA1001 | 32 | Lithic Material Concentration | Private | Undetermined |
| 24GA1097 | 33 | Historic Mining | State Owned | Undetermined |
| 24GA1130 | 32 | Lithic Material Concentration | Private | Undetermined |
| 24GA1511 | 27 | Historic Vehicular/Foot Bridge | MDT | Eligible |
| 24GA1548 | 23 | Historic Log Structure | No Data | Undetermined |
| 24GA1549 | 23 | Lithic Material Concentration | No Data | Eligible |
| 24GA1746 | 12 | Lithic Material Concentration | Forest Service | Eligible |
| 24GA1747 | 13 | Lithic Material Concentration | Forest Service | Eligible |
| 24GA1748 | 13 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA1977 | 22, 23 | Historic Road/Trail | Forest Service | Undetermined |
| **Township 7 South Range 4 East** | | | | |
| 24GA0162 | 16 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA0319 | 17 | Lithic Material Concentration | No Data | Undetermined |
| 24GA0322 | 17 | Lithic Material Concentration | No Data | Undetermined |
| 24GA0396 | 16 | Lithic Material Concentration | Forest Service | Undetermined |
| 24GA0844 | 16 | Historic Ranger Station | Forest Service | Eligible |
| 24GA1143 | 5 | Lithic Material Concentration | Private | Undetermined |
| 24GA1181 | 16 | Lithic Material Concentration | Combination | Undetermined |
| 24GA1366 | 16 | Historic Road/Trail | Forest Service | Undetermined |
| 24GA1550 | 16 | Lithic Material Concentration | No Data | Undetermined |

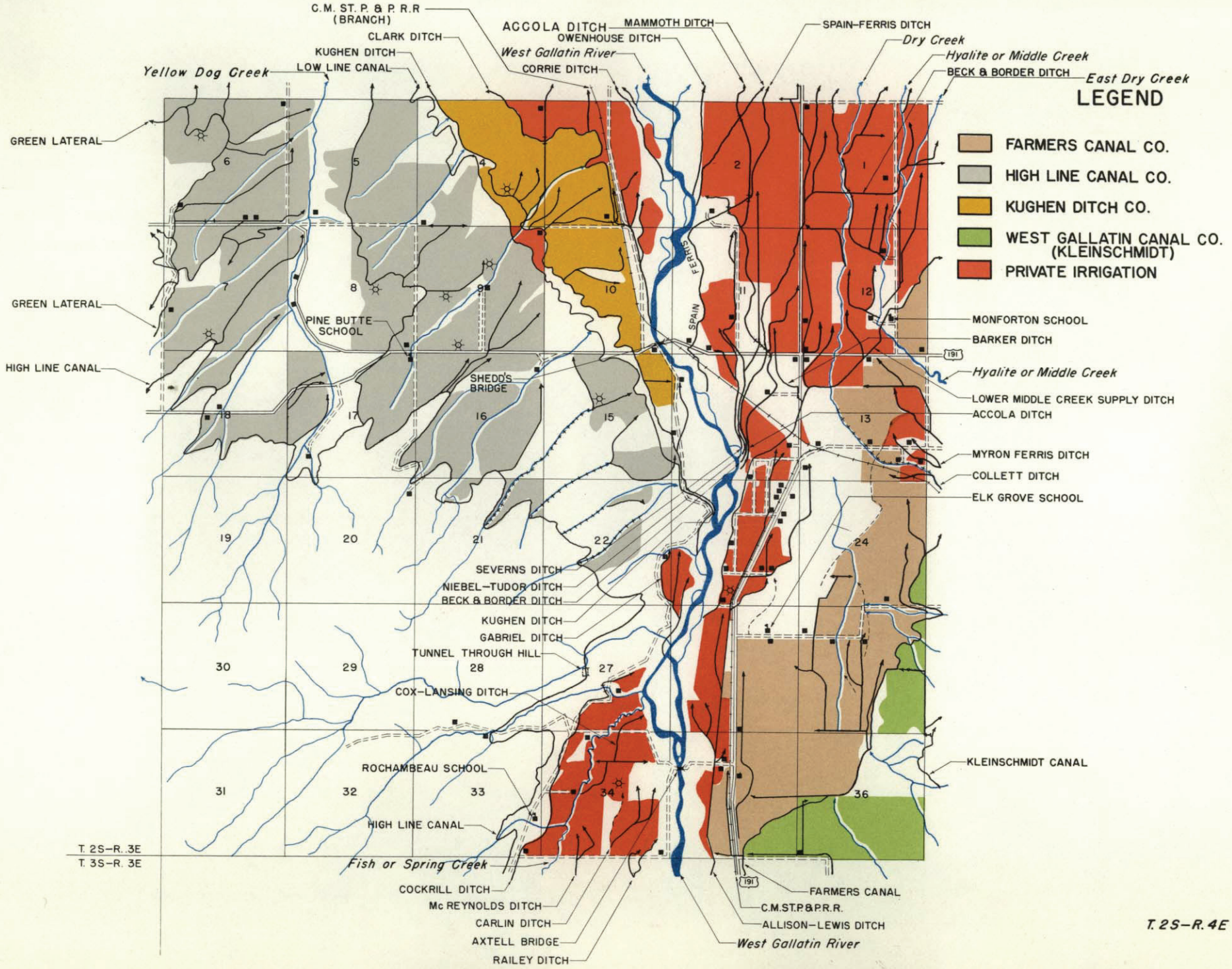
***Undetermined:*** *This SHPO designation is given to sites that have never had an eligibility determination in connection with formal consultation.* ***Eligible:*** *SHPO and the agency agree that the site is eligible by consensus or a determination has been made by the Keeper of the National Register.* ***NR Listed:*** *Currently listed in the NRHP.*

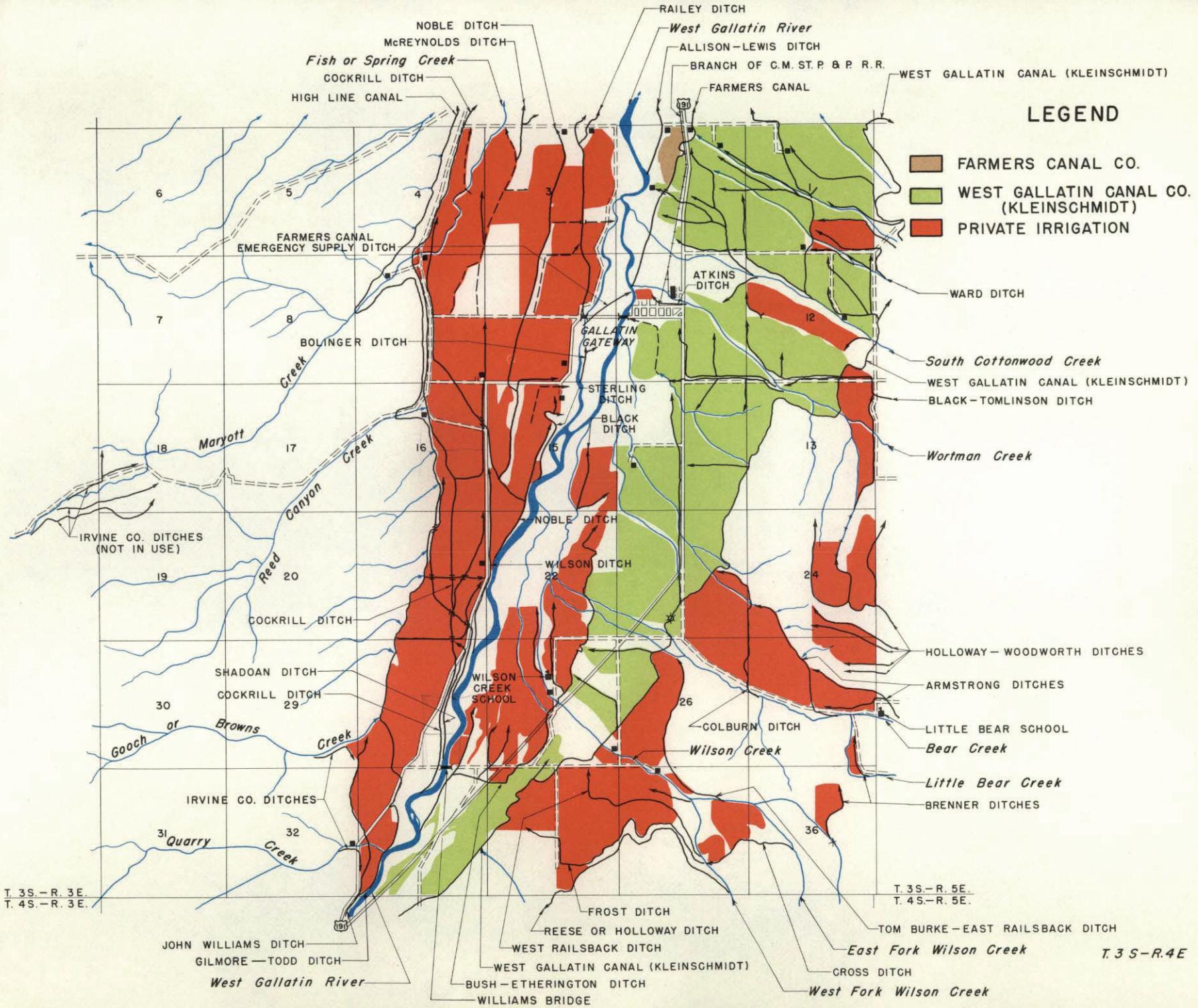
** Site occurs in multiple township/ranges and is repeated in table.*

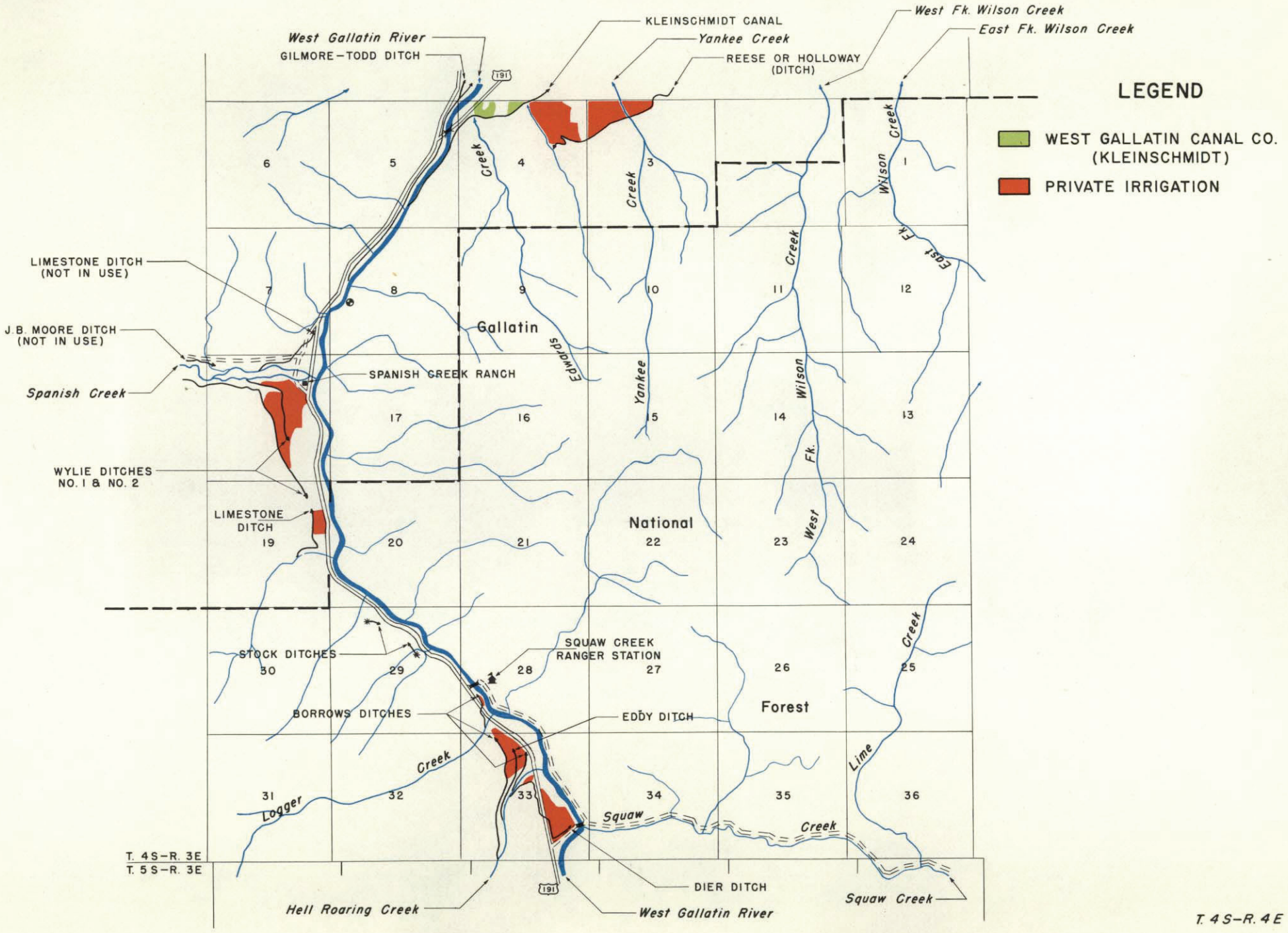
US 191 Corridor Study
*Four Corners to Beaver Creek*

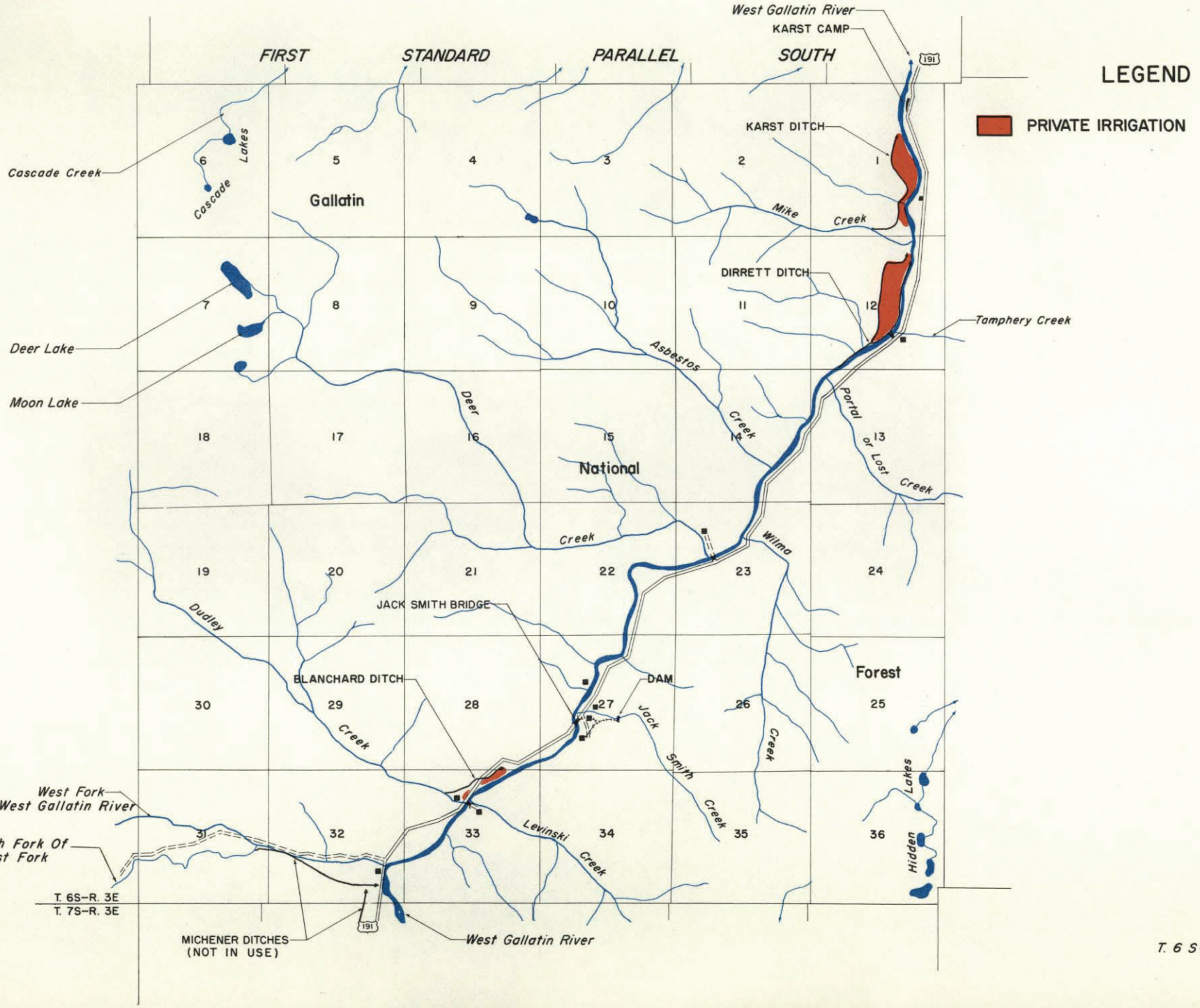
# Appendix C:

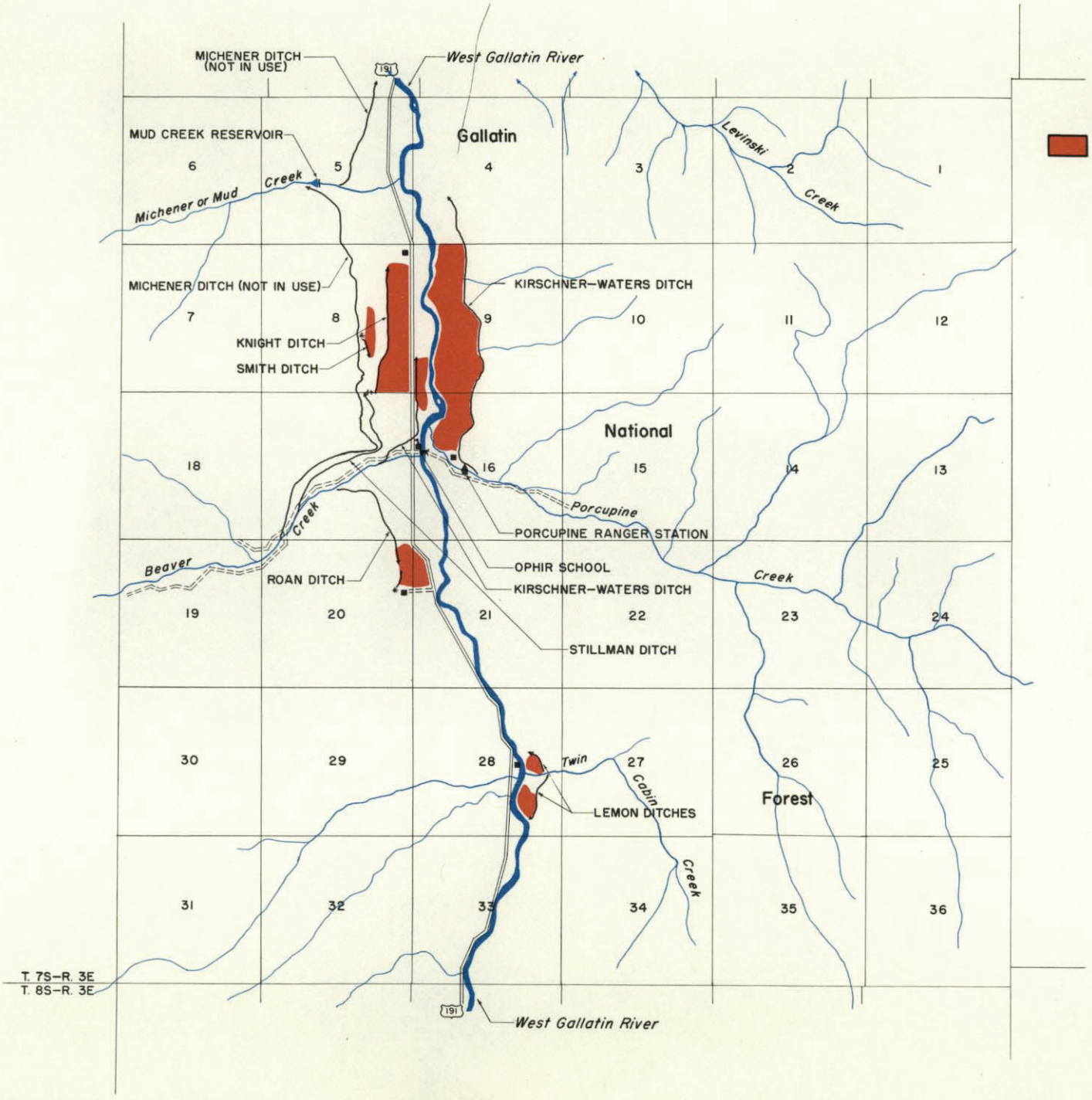
## *DNRC Water Resources Survey*


C.M. ST. P. & P. R.R (BRANCH)
ACCOLA DITCH
MAMMOTH DITCH
SPAIN-FERRIS DITCH
CLARK DITCH
OWENHOUSE DITCH
Dry Creek
KUGHEN DITCH
West Gallatin River
Hyalite or Middle Creek
Yellow Dog Creek
LOW LINE CANAL
CORRIE DITCH
BECK & BORDER DITCH
East Dry Creek
LEGEND
FARMERS CANAL CO.
HIGH LINE CANAL CO.
KUGHEN DITCH CO.
WEST GALLATIN CANAL CO. (KLEINSCHMIDT)
PRIVATE IRRIGATION
GREEN LATERAL
GREEN LATERAL
PINE BUTTE SCHOOL
MONFORTON SCHOOL
BARKER DITCH
HIGH LINE CANAL
SHEDD'S BRIDGE
Hyalite or Middle Creek
LOWER MIDDLE CREEK SUPPLY DITCH
ACCOLA DITCH
MYRON FERRIS DITCH
COLLETT DITCH
ELK GROVE SCHOOL
SEVERNS DITCH
NIEBEL-TUDOR DITCH
BECK & BORDER DITCH
KUGHEN DITCH
GABRIEL DITCH
TUNNEL THROUGH HILL
COX-LANSING DITCH
ROCHAMBEAU SCHOOL
KLEINSCHMIDT CANAL
HIGH LINE CANAL
T. 2S-R. 3E
T. 3S-R. 3E
Fish or Spring Creek
COCKRILL DITCH
Mc REYNOLDS DITCH
CARLIN DITCH
AXTELL BRIDGE
RAILEY DITCH
FARMERS CANAL
C.M.ST.P.&P.R.R.
ALLISON-LEWIS DITCH
West Gallatin River
SPAIN FERRIS
191
T. 2S-R. 4E


RAILEY DITCH
NOBLE DITCH
McREYNOLDS DITCH
Fish or Spring Creek
COCKRILL DITCH
HIGH LINE CANAL
West Gallatin River
ALLISON—LEWIS DITCH
BRANCH OF C.M. ST. P. & P. R.R.
FARMERS CANAL
WEST GALLATIN CANAL (KLEINSCHMIDT)
LEGEND
FARMERS CANAL CO.
WEST GALLATIN CANAL CO. (KLEINSCHMIDT)
PRIVATE IRRIGATION
FARMERS CANAL EMERGENCY SUPPLY DITCH
ATKINS DITCH
WARD DITCH
BOLINGER DITCH
GALLATIN GATEWAY
South Cottonwood Creek
WEST GALLATIN CANAL (KLEINSCHMIDT)
STERLING DITCH
BLACK—TOMLINSON DITCH
BLACK DITCH
Wortman Creek
Maryott Creek
Canyon Creek
Reed
IRVINE CO. DITCHES (NOT IN USE)
NOBLE DITCH
WILSON DITCH
COCKRILL DITCH
HOLLOWAY—WOODWORTH DITCHES
SHADOAN DITCH
ARMSTRONG DITCHES
WILSON CREEK SCHOOL
COCKRILL DITCH
COLBURN DITCH
LITTLE BEAR SCHOOL
Gooch or Browns Creek
Wilson Creek
Bear Creek
Little Bear Creek
IRVINE CO. DITCHES
BRENNER DITCHES
Quarry Creek
T. 3S.—R. 3E.
T. 4S.—R. 3E.
T. 3S.—R. 5E.
T. 4S.—R. 5E.
FROST DITCH
REESE OR HOLLOWAY DITCH
TOM BURKE—EAST RAILSBACK DITCH
WEST RAILSBACK DITCH
East Fork Wilson Creek
JOHN WILLIAMS DITCH
WEST GALLATIN CANAL (KLEINSCHMIDT)
T. 3 S—R. 4 E
GILMORE—TODD DITCH
CROSS DITCH
West Gallatin River
BUSH—ETHERINGTON DITCH
West Fork Wilson Creek
WILLIAMS BRIDGE


West Gallatin River
GILMORE-TODD DITCH
KLEINSCHMIDT CANAL
Yankee Creek
REESE OR HOLLOWAY (DITCH)
West Fk. Wilson Creek
East Fk. Wilson Creek
LEGEND
WEST GALLATIN CANAL CO. (KLEINSCHMIDT)
PRIVATE IRRIGATION
LIMESTONE DITCH (NOT IN USE)
J.B. MOORE DITCH (NOT IN USE)
Spanish Creek
SPANISH CREEK RANCH
WYLIE DITCHES NO. 1 & NO. 2
LIMESTONE DITCH
STOCK DITCHES
BORROWS DITCHES
SQUAW CREEK RANGER STATION
EDDY DITCH
DIER DITCH
Hell Roaring Creek
West Gallatin River
Squaw Creek
Gallatin
National
Forest
Creek
Edwards
Yankee
Wilson
Fk.
West
Lime
Logger
Squaw
6
5
4
3
1
7
8
9
10
11
12
17
16
15
14
13
19
20
21
22
23
24
30
29
28
27
26
25
31
32
33
34
35
36
191
T. 4S-R. 3E
T. 5S-R. 3E
T. 4S-R. 4E


West Gallatin River
KARST CAMP
FIRST
STANDARD
PARALLEL
SOUTH
191
LEGEND
PRIVATE IRRIGATION
KARST DITCH
Cascade Creek
Lakes
Cascade
6
5
4
3
2
1
Gallatin
Mike
Creek
DIRRETT DITCH
7
8
9
10
11
12
Tamphery Creek
Deer Lake
Moon Lake
Asbestos
Deer
Creek
Portal
or Lost
Creek
18
17
16
15
14
13
National
Creek
Wilma
19
20
21
22
23
24
JACK SMITH BRIDGE
Dudley
BLANCHARD DITCH
DAM
Forest
30
29
28
27
26
25
Creek
Jack
Smith
Creek
Creek
Lakes
West Fork
Of West Gallatin River
South Fork Of
West Fork
31
32
33
34
35
36
Levinski
Creek
Hidden
T. 6S–R. 3E
T. 7S–R. 3E
191
MICHENER DITCHES
(NOT IN USE)
West Gallatin River
T. 6 S–R. 4 E


MICHENER DITCH (NOT IN USE)
West Gallatin River
191
MUD CREEK RESERVOIR
Gallatin
Levinski
Creek
Michener or Mud
Creek
MICHENER DITCH (NOT IN USE)
KIRSCHNER–WATERS DITCH
KNIGHT DITCH
SMITH DITCH
National
Porcupine
Creek
PORCUPINE RANGER STATION
Beaver
Creek
ROAN DITCH
OPHIR SCHOOL
KIRSCHNER–WATERS DITCH
STILLMAN DITCH
Twin
Cabin
Creek
LEMON DITCHES
Forest
T. 7S–R. 3E
T. 8S–R. 3E
West Gallatin River
LEGEND
PRIVATE IRRIGATION
T. 7 S – R. 4 E

US 191 Corridor Study
Four Corners to Beaver Creek

# Appendix D:

## *MTNHP Environmental Summary*

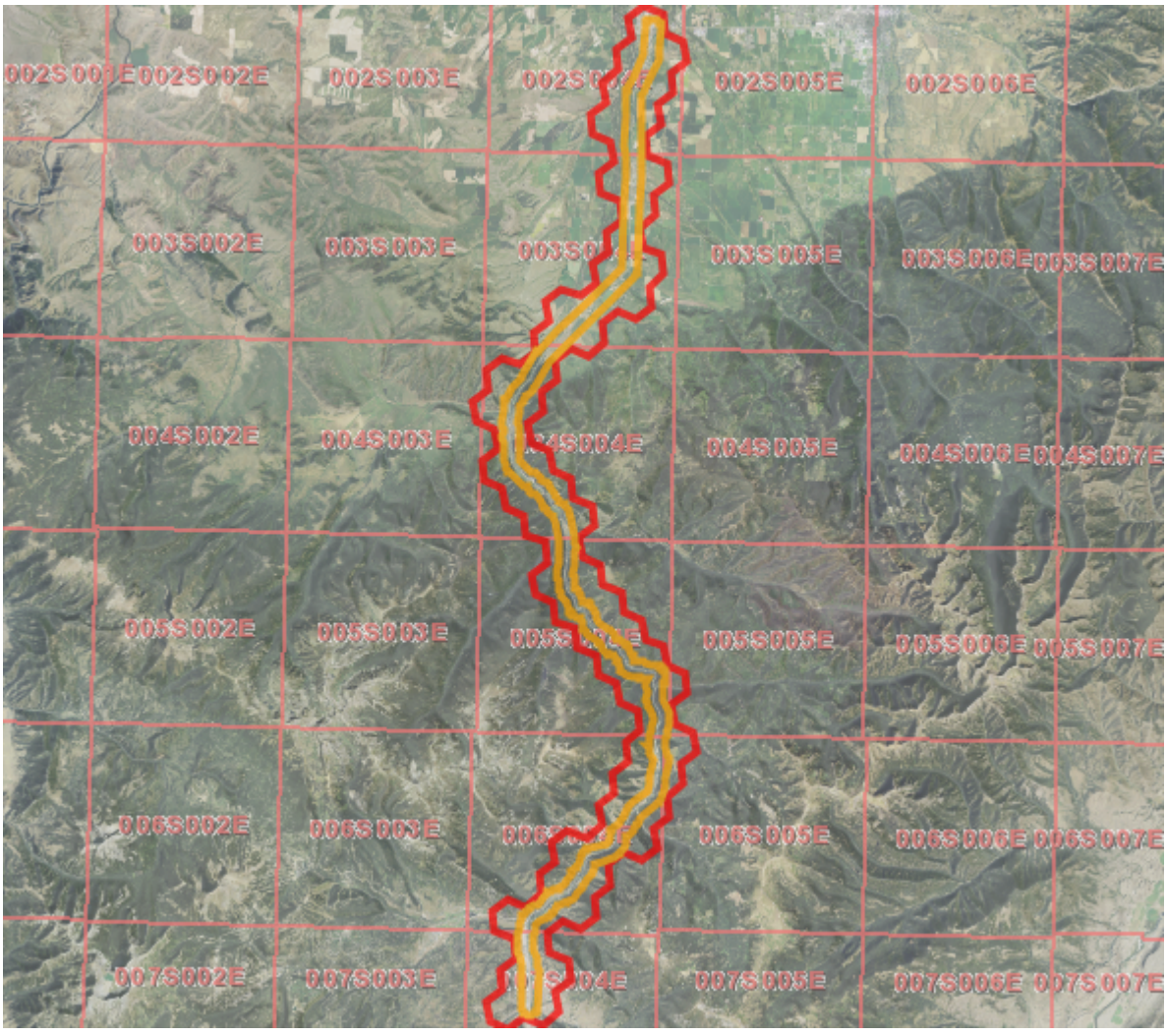
# Environmental Summary

MONTANA
# Natural Heritage Program

1515 East 6th Avenue
Helena, MT 59620
(406) 444-0241
**mtnhp.org**

| Latitude | Longitude |
|---|---|
| 45.21690 | -111.15824 |
| 45.68098 | -111.28669 |

Summarized by:
**20PRVT0049 Hwy191**
*(Custom Area of Interest)*




**Suggested Citation**
Montana Natural Heritage Program. Environmental Summary Report.
for Latitude 45.21690 to 45.68098 and Longitude -111.15824 to -111.28669. Retrieved on 9/25/2019.

The Montana Natural Heritage Program is a program of the Montana State Library's Natural Resource Information System. It is operated as a special program under the Office of the Vice President for Research and Creative Scholarship at the University of Montana, Missoula.

The Montana Natural Heritage Program is part of NatureServe – a network of over 80 similar programs in states, provinces and nations throughout the Western Hemisphere, working to provide comprehensive status and distribution information for species and ecosystems.

Montana Natural Heritage Program · Montana State Library · University of Montana · NatureServe

# Table of Contents



# Introduction to Environmental Summary Report

The Environmental Summary report for your area of interest consists of introductory and related materials in this PDF and an Excel workbook with worksheets summarizing information managed in the Montana Natural Heritage Program's (MTNHP) databases for: (1) species occurrences; (2) other observed species without Species Occurrences; (3) other species potentially present based on their range, presence of associated habitats, or predictive distribution model output if available; (4) structured surveys (organized efforts following a protocol capable of detecting one or more species); (5) land cover mapped as ecological systems; (6) wetland and riparian mapping; (7) land management categories; and (8) biological reports associated with plant and animal observations. In order to do this in a consistent manner across Montana and allow for rapid delivery of summaries, we have intersected this information with a uniform grid of hexagons that have been used for planning efforts across the western United States (e.g. Western Association of Fish and Wildlife Agencies - Crucial Habitat Assessment Tool). Each hexagon is one square mile in area and approximately one kilometer in length on each side. Summary information for each data layer is then stored with each hexagon and those summaries are added up to an overall summary for the report area you have requested. Users should be aware that summaries do not correspond to the exact boundaries of the polygon they have specified, but instead are a summary across all hexagons intersected by the polygon they specified.

In presenting this information, MTNHP is working towards assisting the user with rapidly assessing the known or potential species and biological communities, land management categories, and biological reports associated with the report area. We remind users that this information is likely incomplete and may be inaccurate as surveys to document species are lacking in many areas of the state, species' range polygons often include regions of unsuitable habitat, methods of predicting the presence of species or communities are constantly improving, and information is constantly being added and updated in our databases. **Field verification by professional biologists of the absence or presence of species and biological communities in a report area will always be an important obligation of users of our data. Users are encouraged to only use this environmental summary report as a starting point for more in depth analyses and are encouraged to contact state, federal, and tribal resource management agencies for additional data or management guidelines relevant to your efforts. Please see the Appendix for introductory materials to each section of the report, additional information resources, and a list of relevant agency contacts.**

MONTANA Natural Heritage Program

A program of the **Montana State Library's Natural Resource Information System** operated by the **University of Montana**.

**Legend**

| Model Icons | Habitat Icons | Range Icons | Num Obs |
|---|---|---|---|
| N Suitable (native range) | C Common | I Introduced | Count of obs with 'good precision' (<=1000m) |
| O Optimal Suitability | O Occasional | Y Year-round | + indicates additional 'poor precision' obs (1001m-10,000m) |
| M Moderate Suitability | | S Summer | |
| L Low Suitability | | W Winter | |
| I Suitable (introduced range) | | M Migratory | |
| | | H Historic | |

| Latitude | Longitude |
|---|---|
| 45.21690 | -111.15824 |
| 45.68098 | -111.28669 |

# Native Species

Summarized by: **20PRVT0049 Hwy191** *(Custom Area of Interest)*

Filtered by:

**MT_Status='Species of Concern', 'Special Status', 'Important Animal Habitat', 'Potential SOC'**

Map not shown for scales greater than 1:80,000

## Species Occurrences

| | USFWS Sec7 | # SO | # Obs | Predictive Model | Associated Habitat | Range |
|---|---|---|---|---|---|---|
| **F - Westslope Cutthroat Trout** *(Oncorhynchus clarkii lewisi)* SOC | | 5 | + | | Not Assigned | Y |

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5T4** State: **S2** USFS: **Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)**
BLM: **SENSITIVE** FWP SWAP: **SGCN2**

**Delineation Criteria** Stream reaches and standing water bodies where the species presence has been confirmed through direct capture or where they are believed to be present based on the professional judgement of a fisheries biologist due to confirmed presence in adjacent areas. In order to reflect the importance of adjacent terrestrial habitats to survival, stream reaches are buffered 100 meters, standing water bodies greater than 1 acre are buffered 50 meters, and standing water bodies less than 1 acre are buffered 30 meters into the terrestrial habitat based on PACFISH/INFISH Riparian Conservation Area standards. (Last Updated: Mar 30, 2018)

**Predictive Models:** N 18% Suitable (native range) (deductive)

| | | | | | | |
|---|---|---|---|---|---|---|
| **V - Castilleja gracillima** *(Slender Indian Paintbrush)* SOC | | 1 | 1 | | | Y |

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G3G4** State: **S2**

**Delineation Criteria** Individual occurrences are generally based upon a discretely mapped area provided by an observer and are not separated by any pre-defined distance. Individual clusters of plants mapped at fine spatial scales (separated by less than approximately 25-50 meters) may be grouped together into one occurrence if they are not separated by distinct areas of habitat or terrain features. Point observations are buffered to encompass any locational uncertainty associated with the observation. (Last Updated: Jun 14, 2019)

**Predictive Models:** O 5% Optimal (inductive), M 36% Moderate (inductive), L 43% Low (inductive) **Associated Habitats:** O 7% Occasional

| | | | | | | |
|---|---|---|---|---|---|---|
| **B - Clark's Nutcracker** *(Nucifraga columbiana)* SOC | | 4 | 4 + | | | Y |

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** USFS: **Species of Conservation Concern on Forests (FLAT)**
FWP SWAP: **SGCN3** PIF: **3**

**Delineation Criteria** Observations with direct evidence of breeding activity or indirect evidence of breeding activity between early March and mid-July within forested habitats containing Whitebark Pine (Pinus albicaulis), Limber Pine (Pinus flexilis), or Ponderosa Pine (Pinus ponderosa). Observations are buffered by a minimum distance of 1,000 meters in order to encompass the spring/summer breeding territory size reported for the species or the locational uncertainy of the observation to a maximum distance of 10,000 meters. (Last Updated: Aug 07, 2019)

**Predictive Models:** O 2% Optimal (inductive), M 69% Moderate (inductive), L 29% Low (inductive) **Associated Habitats:** C 56% Common

| | | | | | | |
|---|---|---|---|---|---|---|
| **B - Peregrine Falcon** *(Falco peregrinus)* SOC | | 4 | 24 | | | Y |

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3** USFWS: **DM; MBTA; BCC10; BCC11; BCC17**
USFS: **Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

**Delineation Criteria** Confirmed nesting area buffered by a minimum distance of 500 meters in order to encompass the area around the nest known to be defended by adults as well as the minimum distance reported between nests. Otherwise the nest area is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 28, 2019)

**Predictive Models:** O 2% Optimal (inductive), M 10% Moderate (inductive), L 56% Low (inductive)
**Associated Habitats:** C 13% Common, O 13% Occasional

| | | | | | | |
|---|---|---|---|---|---|---|
| **M - Little Brown Myotis** *(Myotis lucifugus)* SOC | | 6 | 5 | | | Y |

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G3** State: **S3** FWP SWAP: **SGCN3**

**Delineation Criteria** Confirmed area of occupancy based on the documented presence (mistnet captures, definitively identified acoustic recordings, or definitively identified roosting individuals) of adults or juveniles. Point observation location is buffered by a distance of 1,600 meters in order to encompass the greater than 1,500 meters foraging distance reported for the species in New Brunswick, Canada and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. When cave locations are involved, point observations are mapped in the center of a one-square mile hexagon to protect the exact location of the cave entrance as per the Federal Cave Resource Protection Act and associated regulations (U.S. Code Title 16 Chapter 63, Code of Federal Regulations Title 43 Subtitle A Part 37). The outer edges of the hexagon are then buffered by a distance of 1,600 meters and otherwise by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. All of the one-square mile hexagons intersecting this buffered area are presented as the Species Occurrence record. (Last Updated: May 14, 2019)

**Predictive Models:** M 39% Moderate (inductive), L 61% Low (inductive) **Associated Habitats:** C 83% Common, O 17% Occasional

| | | | | | | |
|---|---|---|---|---|---|---|
| **M - Hoary Bat** *(Lasiurus cinereus)* SOC | | 3 | 1 | | | S M |

View in Field Guide View Predicted Models View Associated Habitat View Range Maps

Species of Concern - Native Species Global: **G3G4** State: **S3** FWP SWAP: **SGCN3**

**Delineation Criteria** Confirmed area of occupancy based on the documented presence (mistnet captures, definitively identified acoustic recordings, and definitively identified roosting individuals) of adults or juveniles during the active season. Point observation location is buffered by a minimum distance of 3,500 meters in order to be conservative about encompassing the maximum reported foraging distance for the congeneric Lasiurus borealis and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: May 14, 2019)

**Predictive Models:** M 31% Moderate (inductive), L 69% Low (inductive) **Associated Habitats:** C 75% Common, O 22% Occasional

**B - Bald Eagle** *(Haliaeetus leucocephalus)* **SSS** 3 14 + Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps

Special Status Species - Native Species Global: **G5** State: **S4** USFWS: **DM; BGEPA; MBTA; BCC10; BCC11; BCC17** USFS: **Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)** BLM: **SENSITIVE** PIF: **2**

**Delineation Criteria** Confirmed nesting area buffered by a minimum distance of 2,000 meters in order to be conservative about encompassing the breeding territory and area commonly used for renesting and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Aug 07, 2019)

**Predictive Models:** M 20% Moderate (inductive), L 79% Low (inductive) **Associated Habitats:** C 41% Common, O 22% Occasional

**B - Great Blue Heron** *(Ardea herodias)* **SOC** 2 3 + Y S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3**

**Delineation Criteria** Confirmed nesting area buffered by a minimum distance of 6,500 meters in order to be conservative about encompassing the areas commonly used for foraging near the breeding colony and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Sep 17, 2019)

**Predictive Models:** M 20% Moderate (inductive), L 62% Low (inductive) **Associated Habitats:** C 10% Common

**B - Golden Eagle** *(Aquila chrysaetos)* **SOC** 2 + Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **BGEPA; MBTA; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3**

**Delineation Criteria** Confirmed nesting area buffered by a minimum distance of 3,000 meters in order to be conservative about encompassing the entire breeding territory and area commonly used for renesting and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Sep 19, 2019)

**Predictive Models:** M 18% Moderate (inductive), L 80% Low (inductive) **Associated Habitats:** C 24% Common, O 10% Occasional

**M - Grizzly Bear** *(Ursus arctos)* **SOC** 1 + Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps

Species of Concern - Native Species Global: **G4** State: **S2S3** USFWS: **PS: LT; XN** USFS: **Threatened on Forests (BD, CG, HLC, KOOT, LOLO)** BLM: **THREATENED** FWP SWAP: **SGCN2-3**

**Delineation Criteria** Species Occurrence polygons represent the greatest extent of 1) Recovery Zone Boundaries, 2) Demographic Monitoring Areas, and 3) Current Known Distribution within Montana as defined in the 2018 Grizzly Bear Recovery Program annual report. This includes the Bitterroot Recovery Zone, which is not currently occupied by a resident population of Grizzly Bears. (Last Updated: Jul 05, 2019)

**Predictive Models:** M 11% Moderate (inductive), L 84% Low (inductive) **Associated Habitats:** C 67% Common, O 8% Occasional

**A - Western Toad** *(Anaxyrus boreas)* **SOC** 1 3 + Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps

Species of Concern - Native Species Global: **G4** State: **S2** USFS: **Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN2**

**Delineation Criteria** Standing water bodies or portions of large water bodies with confirmed evidence of reproduction (calling adults, eggs, larvae or new metamorphs) buffered by 100 meters in order to reflect importance of adjacent terrestrial habitats to survival of breeding adults and newly metamorphosed juveniles. (Last Updated: Jul 03, 2019)

**Predictive Models:** M 10% Moderate (inductive), L 84% Low (inductive) **Associated Habitats:** C 70% Common, O 14% Occasional

**M - Townsend's Big-eared Bat** *(Corynorhinus townsendii)* **SOC** 1 1 Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3** USFS: **Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN3**

**Delineation Criteria** Confirmed area of occupancy based on the documented presence (mistnet captures, definitively identified acoustic recordings, and definitively identified roosting individuals) of adults or juveniles. Point observation location is buffered by a distance of 4,500 meters in order to encompass the 95% confidence interval for nightly foraging distance reported for the species in California and otherwise by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. When cave locations are involved, point observations are mapped in the center of a one-square mile hexagon to protect the exact location of the cave entrance as per the Federal Cave Resource Protection Act and associated regulations (U.S. Code Title 16 Chapter 63, Code of Federal Regulations Title 43 Subtitle A Part 37). The outer edges of the hexagon are then buffered by a distance of 4,500 meters and otherwise by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. All of the one-square mile hexagons intersecting this buffered area are presented as the Species Occurrence record. (Last Updated: May 14, 2019)

**Predictive Models:** M 7% Moderate (inductive), L 89% Low (inductive) **Associated Habitats:** C 68% Common, O 16% Occasional

**M - Wolverine** *(Gulo gulo)* **SOC** 7 1 + Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3** USFWS: **P** USFS: **Proposed on Forests (BD, BRT, CG, HLC, KOOT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN3**

**Delineation Criteria** Confirmed area of occupancy supported by recent (post-1980), nearby (within 10 kilometers) observations of adults or juveniles. Tracking regions were defined by areas of primary habitat and adjacent female dispersal habitat as modeled by Inman et al. (2013). These regions were buffered by 1 kilometer in order to link smaller areas and account for potential inaccuracies in independent variables used in the model. (Last Updated: Sep 03, 2014)

**Predictive Models:** M 5% Moderate (inductive), L 66% Low (inductive) **Associated Habitats:** C 50% Common, O 10% Occasional

**M - Canada Lynx** *(Lynx canadensis)* **SOC** 7 1 Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **LT; CH** USFS: **Threatened on Forests (BD, BRT) Threatened, Critical Habitat on Forests (CG, HLC, KOOT, LOLO)** BLM: **THREATENED** FWP SWAP: **SGCN3**

**Delineation Criteria** Areas designated as Critical Habitat for the species by the U.S. Fish and Wildlife Service on September 12, 2014 because they currently contain physical and biological features (e.g. boreal forests with snowshoe hare) essential to the conservation of the species and state and other lands within the outer boundaries of USFWS Critical Habitat polygons. (Last Updated: Dec 15, 2014)

**Predictive Models:** L 93% Low (inductive) **Associated Habitats:** C 42% Common, O 8% Occasional

**B - Pacific Wren** *(Troglodytes pacificus)* SOC — 1 | 1 | Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **2**

**Delineation Criteria** Observations with evidence of breeding activity buffered by a minimum distance of 300 meters in order to be conservative about encompassing home ranges and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Aug 07, 2019)

**Predictive Models:** L 49% Low (inductive) **Associated Habitats:** C 15% Common, O 26% Occasional

**V - Pinus albicaulis** *(Whitebark Pine)* SOC — 6 | 1 | Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G3?** State: **S3** USFWS: **C** USFS: **Candidate on Forests (BD, BRT, CG, HLC, KOOT, LOLO)** BLM: **SENSITIVE**

**Delineation Criteria** Point and/or polygonal observations are buffered by a minimum distance of 400 meters in order to account for stands instead of individual trees and to a maximum distance of 2,000 meters in order to encompass locational uncertainty associated with some common data sources for this species. (Last Updated: Sep 17, 2019)

**Predictive Models:** L 5% Low (inductive) **Associated Habitats:** C 5% Common

**V - Ranunculus hyperboreus** *(High Northern Buttercup)* PSOC — 1 | 1 | Not Available

View in Field Guide | View Associated Habitat

Potential Species of Concern - Native Species Global: **G5** State: **S3S4**

**Delineation Criteria** Individual occurrences are generally based upon a discretely mapped area provided by an observer and are not separated by any pre-defined distance. Individual clusters of plants mapped at fine spatial scales (separated by less than approximately 25-50 meters) may be grouped together into one occurrence if they are not separated by distinct areas of habitat or terrain features. Point observations are buffered to encompass any locational uncertainty associated with the observation. (Last Updated: Jan 05, 2019)

**Associated Habitats:** C 4% Common

**I - Discus shimekii** *(Striate Disc)* SOC — 1 | 2 | Not Available | Not Assigned | Y

View in Field Guide | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S1**

**Delineation Criteria** Confirmed breeding area based on the presence of a resident animal of any age. Point observation location is buffered by a minimum distance of 100 meters in order to encompass the home range of the individual as well as adjacent habitat likely to support other individuals and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 16, 2014)

**I - Isocapnia integra** *(Alberta Snowfly)* SOC — 1 | + | Not Available | Not Assigned | Y

View in Field Guide | View Range Maps

Species of Concern - Native Species Global: **G4G5** State: **S2**

**Delineation Criteria** Confirmed breeding area based on the presence of a resident animal of any age. Point observation location is buffered by a minimum distance of 100 meters in order to encompass the home range of the individual as well as adjacent habitat likely to support other individuals and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Mar 22, 2016)

**I - Oreohelix yavapai mariae** *(Gallatin Mountainsnail)* SOC — 3 | 6 | Not Available | Not Assigned | Y

View in Field Guide | View Range Maps

Species of Concern - Native Species Global: **G5T1** State: **S1**

**Delineation Criteria** Confirmed breeding area based on the presence of a resident animal of any age. Point observation location is buffered by a minimum distance of 100 meters in order to encompass the home range of the individual as well as adjacent habitat likely to support other individuals and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jul 13, 2011)

**O - Bat Roost (Cave)** *(Bat Roost (Cave))* IAH — 1 | Not Available | Not Assigned

View in Field Guide

Important Animal Habitat - Native Species Global: **GNR** State: **SNR**

**Delineation Criteria** Confirmed occupancy of a cave based on the documented presence of adults or juveniles of any bat species. Point observation locations are mapped in the center of a one-square mile hexagon to protect the exact location of the cave entrance as per the Federal Cave Resource Protection Act and associated regulations (U.S. Code Title 16 Chapter 63, Code of Federal Regulations Title 43 Subtitle A Part 37). The outer edges of the hexagon are then buffered by a distance of 4,500 meters in order to encompass the 95% confidence interval for nightly foraging distance reported for Townsendâ€™s Big-eared Bat (a resident Montana bat Species of Concern) and otherwise by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. All of the one-square mile hexagons intersecting this buffered area are presented as the Species Occurrence record. (Last Updated: Sep 05, 2017)

**Legend**

| Model Icons | Habitat Icons | Range Icons | Num Obs |
|---|---|---|---|
| N Suitable (native range) | C Common | I Introduced | Count of obs with 'good precision' (<=1000m) |
| O Optimal Suitability | O Occasional | Y Year-round | + indicates additional 'poor precision' obs (1001m-10,000m) |
| M Moderate Suitability | | S Summer | |
| L Low Suitability | | W Winter | |
| I Suitable (introduced range) | | M Migratory | |
| | | H Historic | |

| Latitude | Longitude |
|---|---|
| 45.21690 | -111.15824 |
| 45.68098 | -111.28669 |

# Native Species

Summarized by: **20PRVT0049 Hwy191** *(Custom Area of Interest)*
Filtered by:
**MT_Status='Species of Concern', 'Special Status', 'Important Animal Habitat', 'Potential SOC'**

## Other Observed Species

| | USFWS Sec7 | # Obs | Predictive Model | Associated Habitat | Range |
|---|---|---|---|---|---|
| **B - Northern Goshawk** *(Accipiter gentilis)* **SOC** | | + | | | Y WM |
| **B - Cassin's Finch** *(Haemorhous cassinii)* **SOC** | | + | | | Y |
| **B - Great Gray Owl** *(Strix nebulosa)* **SOC** | | + | | | Y |
| **M - Uinta Ground Squirrel** *(Urocitellus armatus)* **PSOC** | | 1 + | | | Y |
| **B - Green-tailed Towhee** *(Pipilo chlorurus)* **SOC** | | + | | | S M |
| **M - Silver-haired Bat** *(Lasionycteris noctivagans)* **PSOC** | | 4 | | | Y |
| **B - Western Screech-Owl** *(Megascops kennicottii)* **PSOC** | | 1 | | | Y |
| **B - Hooded Merganser** *(Lophodytes cucullatus)* **PSOC** | | 1 | | | Y M |
| **B - Boreal Owl** *(Aegolius funereus)* **PSOC** | | + | | | Y |
| **B - Long-billed Curlew** *(Numenius americanus)* **SOC** | | 1 | | | S M |
| **B - Greater Sage-Grouse** *(Centrocercus urophasianus)* **SOC** | | 1 | | | Y |

**B - Northern Goshawk** *(Accipiter gentilis)* **SOC**

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **2**

**Predictive Models:** O 2% Optimal (inductive), M 54% Moderate (inductive), L 39% Low (inductive)
**Associated Habitats:** C 41% Common, O 5% Occasional

**B - Cassin's Finch** *(Haemorhous cassinii)* **SOC**

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA; BCC10** FWP SWAP: **SGCN3** PIF: **3**

**Predictive Models:** M 70% Moderate (inductive), L 25% Low (inductive) **Associated Habitats:** C 46% Common

**B - Great Gray Owl** *(Strix nebulosa)* **SOC**

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN** PIF: **3**

**Predictive Models:** M 62% Moderate (inductive), L 23% Low (inductive) **Associated Habitats:** C 59% Common, O 1% Occasional

**M - Uinta Ground Squirrel** *(Urocitellus armatus)* **PSOC**

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S3S4** FWP SWAP: **SGIN**

**Predictive Models:** M 59% Moderate (inductive), L 36% Low (inductive) **Associated Habitats:** C 60% Common

**B - Green-tailed Towhee** *(Pipilo chlorurus)* **SOC**

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**

**Predictive Models:** M 31% Moderate (inductive), L 69% Low (inductive) **Associated Habitats:** C 58% Common, O 11% Occasional

**M - Silver-haired Bat** *(Lasionycteris noctivagans)* **PSOC**

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Potential Species of Concern - Native Species Global: **G3G4** State: **S4**

**Predictive Models:** M 26% Moderate (inductive), L 74% Low (inductive) **Associated Habitats:** C 76% Common, O 20% Occasional

**B - Western Screech-Owl** *(Megascops kennicottii)* **PSOC**

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Potential Species of Concern - Native Species Global: **G4G5** State: **S3S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **3**

**Predictive Models:** M 21% Moderate (inductive), L 72% Low (inductive) **Associated Habitats:** C 16% Common, O 4% Occasional

**B - Hooded Merganser** *(Lophodytes cucullatus)* **PSOC**

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **2**

**Predictive Models:** M 11% Moderate (inductive), L 16% Low (inductive) **Associated Habitats:** C 11% Common

**B - Boreal Owl** *(Aegolius funereus)* **PSOC**

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S3S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **3**

**Predictive Models:** M 7% Moderate (inductive), L 54% Low (inductive) **Associated Habitats:** C 49% Common, O 4% Occasional

**B - Long-billed Curlew** *(Numenius americanus)* **SOC**

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

**Predictive Models:** L 36% Low (inductive) **Associated Habitats:** C 6% Common, O 12% Occasional

**B - Greater Sage-Grouse** *(Centrocercus urophasianus)* **SOC**

View in Field Guide  View Predicted Models  View Associated Habitat  View Range Maps

USFS: **Sensitive - Known on Forests (BD)**

Species of Concern - Native Species  Global: **G3G4**  State: **S2**  **Sensitive - Suspected on Forests (CG, HLC)**  BLM: **SENSITIVE**

FWP SWAP: **SGCN2**  PIF: **1**

**Predictive Models:** L 3% Low (inductive)  **Associated Habitats:** C 8% Common

**F - Yellowstone Cutthroat Trout** *(Oncorhynchus clarkii bouvieri)* SOC  1 +  Not Assigned  I

View in Field Guide  View Predicted Models  View Range Maps

Species of Concern - Native Species  Global: **G5T4**  State: **S2**  USFS: **Sensitive - Known on Forests (CG)**  BLM: **SENSITIVE**  FWP SWAP: **SGCN2**

**Predictive Models:** I 67% Suitable (introduced range) (deductive)

**B - Harlequin Duck** *(Histrionicus histrionicus)* SOC  6  Not Available  S  M

View in Field Guide  View Associated Habitat  View Range Maps

Species of Concern - Native Species  Global: **G4**  State: **S2B**  USFWS: **MBTA**  USFS: **Sensitive - Known on Forests (BD, CG, HLC, KOOT, LOLO)**

FWP SWAP: **SGCN2**  PIF: **1**

**Associated Habitats:** C 5% Common, O 1% Occasional

**B - Black Swift** *(Cypseloides niger)* SOC  1  Not Available

View in Field Guide  View Associated Habitat

Species of Concern - Native Species  Global: **G4**  State: **S1B**  USFWS: **MBTA; BCC10**  USFS: **Species of Conservation Concern on Forests (FLAT)**

FWP SWAP: **SGCN1, SGIN**  PIF: **2**

**Associated Habitats:** C 2% Common

**B - American White Pelican** *(Pelecanus erythrorhynchos)* SOC  +  Not Available  M

View in Field Guide  View Associated Habitat  View Range Maps

Species of Concern - Native Species  Global: **G4**  State: **S3B**  USFWS: **MBTA**  FWP SWAP: **SGCN3**  PIF: **3**

**Associated Habitats:** C 1% Common

**F - Arctic Grayling** *(Thymallus arcticus)* SOC  +  Not Available  Not Assigned  I H

View in Field Guide  View Range Maps

Species of Concern - Native Species  Global: **G5**  State: **S1**  USFS: **Sensitive - Known on Forests (BD)**  BLM: **SENSITIVE**  FWP SWAP: **SGCN1**

**Legend**

| Model Icons | Habitat Icons | Range Icons | Num Obs |
|---|---|---|---|
| N Suitable (native range) | C Common | I Introduced | Count of obs with 'good precision' (<=1000m) |
| O Optimal Suitability | O Occasional | Y Year-round | + indicates additional 'poor precision' obs (1001m-10,000m) |
| M Moderate Suitability | | S Summer | |
| L Low Suitability | | W Winter | |
| I Suitable (introduced range) | | M Migratory | |
| | | H Historic | |

| Latitude | Longitude |
|---|---|
| 45.21690 | -111.15824 |
| 45.68098 | -111.28669 |

# Native Species

Summarized by: **20PRVT0049 Hwy191** *(Custom Area of Interest)*
Filtered by:
**MT_Status='Species of Concern', 'Special Status', 'Important Animal Habitat', 'Potential SOC'**

## Other Potential Species

| | USFWS Sec7 | Predictive Model | Associated Habitat | Range |
|---|---|---|---|---|
| **V - Carex scoparia** *(Pointed Broom Sedge)* SOC | | | Not Assigned | Y |
| **B - Veery** *(Catharus fuscescens)* SOC | | | | S M |
| **V - Adoxa moschatellina** *(Musk-root)* SOC | | | Not Assigned | Y |
| **V - Eleocharis rostellata** *(Beaked Spikerush)* SOC | | | Not Assigned | Y |
| **M - Porcupine** *(Erethizon dorsatum)* PSOC | | | | Y |
| **B - Evening Grosbeak** *(Coccothraustes vespertinus)* SOC | | | | Y WM |
| **M - Dwarf Shrew** *(Sorex nanus)* SOC | | | | Y |
| **B - Brown Creeper** *(Certhia americana)* SOC | | | | Y |
| **V - Carex crawei** *(Crawe's Sedge)* SOC | | | Not Assigned | Y |
| **M - Preble's Shrew** *(Sorex preblei)* SOC | | | | Y |
| **M - Merriam's Shrew** *(Sorex merriami)* SOC | | | | Y |

**V - Carex scoparia** *(Pointed Broom Sedge)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S1S2**
**Predictive Models:** O 8% Optimal (inductive), M 56% Moderate (inductive), L 34% Low (inductive)

**B - Veery** *(Catharus fuscescens)* SOC

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
**Predictive Models:** O 5% Optimal (inductive), M 69% Moderate (inductive), L 26% Low (inductive)
**Associated Habitats:** C 10% Common, O 30% Occasional

**V - Adoxa moschatellina** *(Musk-root)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Sensitive - Known on Forests (BD, CG, LOLO)**
**Predictive Models:** M 54% Moderate (inductive), L 15% Low (inductive)

**V - Eleocharis rostellata** *(Beaked Spikerush)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Sensitive - Known on Forests (BD, CG, HLC)** **Species of Conservation Concern on Forests (FLAT)** MNPS: **3**
**Predictive Models:** M 43% Moderate (inductive), L 26% Low (inductive)

**M - Porcupine** *(Erethizon dorsatum)* PSOC

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4** FWP SWAP: **SGIN**
**Predictive Models:** M 34% Moderate (inductive), L 66% Low (inductive) **Associated Habitats:** C 74% Common

**B - Evening Grosbeak** *(Coccothraustes vespertinus)* SOC

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3**
**Predictive Models:** M 30% Moderate (inductive), L 69% Low (inductive) **Associated Habitats:** C 59% Common, O 4% Occasional

**M - Dwarf Shrew** *(Sorex nanus)* SOC

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S2S3** FWP SWAP: **SGCN2-3**
**Predictive Models:** M 28% Moderate (inductive), L 23% Low (inductive) **Associated Habitats:** C 9% Common, O 22% Occasional

**B - Brown Creeper** *(Certhia americana)* SOC

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **1**
**Predictive Models:** M 26% Moderate (inductive), L 54% Low (inductive) **Associated Habitats:** C 41% Common, O 4% Occasional

**V - Carex crawei** *(Crawe's Sedge)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2S3** MNPS: **2**
**Predictive Models:** M 25% Moderate (inductive), L 13% Low (inductive)

**M - Preble's Shrew** *(Sorex preblei)* SOC

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** FWP SWAP: **SGCN3**
**Predictive Models:** M 18% Moderate (inductive), L 41% Low (inductive) **Associated Habitats:** C 35% Common, O 1% Occasional

**M - Merriam's Shrew** *(Sorex merriami)* SOC

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** FWP SWAP: **SGCN3**
**Predictive Models:** M 16% Moderate (inductive), L 57% Low (inductive) **Associated Habitats:** C 20% Common

**M - Water Vole** *(Microtus richardsoni)* **PSOC** Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4**
**Predictive Models:** M 16% Moderate (inductive), L 23% Low (inductive) **Associated Habitats:** C 50% Common, O 1% Occasional

**B - Ovenbird** *(Seiurus aurocapilla)* **PSOC** S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA** PIF: **3**
**Predictive Models:** M 15% Moderate (inductive), L 48% Low (inductive) **Associated Habitats:** C 11% Common, O 1% Occasional

**B - Yellow-billed Cuckoo** *(Coccyzus americanus)* **SOC** S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **PS: LT; MBTA; BCC10** USFS: **Threatened on Forests (BRT, LOLO)**
BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN** PIF: **2**
**Predictive Models:** M 13% Moderate (inductive), L 26% Low (inductive) **Associated Habitats:** C 5% Common

**B - Bobolink** *(Dolichonyx oryzivorus)* **SOC** S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
**Predictive Models:** M 11% Moderate (inductive), L 20% Low (inductive) **Associated Habitats:** C 30% Common, O 1% Occasional

**M - Western Spotted Skunk** *(Spilogale gracilis)* **PSOC** Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **SU** FWP SWAP: **SGIN**
**Predictive Models:** M 8% Moderate (inductive), L 28% Low (inductive) **Associated Habitats:** C 49% Common, O 11% Occasional

**B - Common Poorwill** *(Phalaenoptilus nuttallii)* **PSOC** S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **3**
**Predictive Models:** M 7% Moderate (inductive), L 69% Low (inductive) **Associated Habitats:** C 15% Common, O 56% Occasional

**B - Flammulated Owl** *(Psiloscops flammeolus)* **SOC** S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC10**
USFS: **Sensitive - Known on Forests (BD, BRT, HLC, KOOT, LOLO)**
**Sensitive - Suspected on Forests (CG)**
**Species of Conservation Concern on Forests (FLAT)** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
**Predictive Models:** M 7% Moderate (inductive), L 61% Low (inductive) **Associated Habitats:** C 36% Common, O 9% Occasional

**M - Spotted Bat** *(Euderma maculatum)* **SOC** S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** USFS: **Sensitive - Known on Forests (BD, CG)** BLM: **SENSITIVE**
FWP SWAP: **SGCN3, SGIN**
**Predictive Models:** M 7% Moderate (inductive), L 43% Low (inductive) **Associated Habitats:** C 26% Common, O 42% Occasional

**B - Rufous Hummingbird** *(Selasphorus rufus)* **PSOC** S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA** PIF: **3**
**Predictive Models:** M 5% Moderate (inductive), L 90% Low (inductive) **Associated Habitats:** C 73% Common, O 9% Occasional

**V - Stipa lettermanii** *(Letterman's Needlegrass)* **SOC** Not Assigned Y

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S1S3**
**Predictive Models:** M 5% Moderate (inductive), L 62% Low (inductive)

**B - Brewer's Sparrow** *(Spizella breweri)* **SOC** S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC10; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
**Predictive Models:** M 5% Moderate (inductive), L 61% Low (inductive) **Associated Habitats:** C 8% Common

**V - Trichophorum cespitosum** *(Tufted Club-rush)* **SOC** Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
USFS: **Sensitive - Known on Forests (BD, HLC, KOOT)**
Species of Concern - Native Species Global: **G5** State: **S2** **Species of Conservation Concern on Forests (FLAT)** MNPS: **3**
**Predictive Models:** M 5% Moderate (inductive), L 21% Low (inductive) **Associated Habitats:** C 4% Common

**B - Broad-tailed Hummingbird** *(Selasphorus platycercus)* **PSOC** S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA** FWP SWAP: **SGIN**
**Predictive Models:** M 3% Moderate (inductive), L 72% Low (inductive) **Associated Habitats:** C 59% Common, O 8% Occasional

**B - Trumpeter Swan** *(Cygnus buccinator)* **SOC** Y S W M

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3** USFWS: **MBTA** USFS: **Sensitive - Known on Forests (BD, CG)** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**

**Predictive Models:** M 3% Moderate (inductive), L 44% Low (inductive) **Associated Habitats:** C 11% Common

**M - Fringed Myotis** *(Myotis thysanodes)* **SOC** Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3**

**Predictive Models:** M 2% Moderate (inductive), L 90% Low (inductive) **Associated Habitats:** C 72% Common, O 15% Occasional

**M - Wyoming Ground Squirrel** *(Urocitellus elegans)* **PSOC** Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S3S4**

**Predictive Models:** M 2% Moderate (inductive), L 69% Low (inductive) **Associated Habitats:** C 59% Common, O 9% Occasional

**B - Meesia triquetra** *(Meesia Moss)* **SOC** Not Assigned Y

View in Field Guide | View Predicted Models | View Range Maps

USFS: **Sensitive - Known on Forests (BRT, CG, KOOT)**
**Sensitive - Suspected on Forests (LOLO)**
Species of Concern - Native Species Global: **G5** State: **S2** **Species of Conservation Concern on Forests (FLAT)**

**Predictive Models:** M 2% Moderate (inductive), L 61% Low (inductive)

**V - Agastache cusickii** *(Cusick's Horsemint)* **SOC** Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G3G4** State: **S2S3** USFS: **Sensitive - Known on Forests (BD)** BLM: **SENSITIVE**

**Predictive Models:** M 2% Moderate (inductive), L 36% Low (inductive) **Associated Habitats:** C 7% Common

**B - American Bittern** *(Botaurus lentiginosus)* **SOC** S M

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **3**

**Predictive Models:** M 2% Moderate (inductive), L 21% Low (inductive) **Associated Habitats:** C 10% Common

**B - Sage Thrasher** *(Oreoscoptes montanus)* **SOC** S M

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC10; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **3**

**Predictive Models:** M 2% Moderate (inductive), L 21% Low (inductive) **Associated Habitats:** C 8% Common

**R - Western Milksnake** *(Lampropeltis gentilis)* **SOC** Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S2** USFS: **Sensitive - Known on Forests (CG)** BLM: **SENSITIVE** FWP SWAP: **SGCN2**

**Predictive Models:** M 2% Moderate (inductive), L 13% Low (inductive) **Associated Habitats:** C 6% Common, O 16% Occasional

**B - Lewis's Woodpecker** *(Melanerpes lewis)* **SOC** S M

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S2B** USFWS: **MBTA; BCC10; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **2**

**Predictive Models:** L 77% Low (inductive) **Associated Habitats:** C 1% Common, O 46% Occasional

**B - Barrow's Goldeneye** *(Bucephala islandica)* **PSOC** Y W M

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **2**

**Predictive Models:** L 52% Low (inductive) **Associated Habitats:** C 11% Common

**B - Varied Thrush** *(Ixoreus naevius)* **SOC** S M

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**

**Predictive Models:** L 44% Low (inductive) **Associated Habitats:** C 18% Common, O 1% Occasional

**B - Pinyon Jay** *(Gymnorhinus cyanocephalus)* **SOC** Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G3** State: **S3** USFWS: **MBTA; BCC17** FWP SWAP: **SGCN3**

**Predictive Models:** L 30% Low (inductive) **Associated Habitats:** C 5% Common, O 7% Occasional

**A - Northern Leopard Frog** *(Lithobates pipiens)* **SOC** Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

USFS: **Sensitive - Known on Forests (CG, HLC, KOOT)**
Species of Concern - Native Species Global: **G5** State: **S1,S4** **Sensitive - Suspected on Forests (BRT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN1**

**Predictive Models:** L 26% Low (inductive) **Associated Habitats:** C 1% Common, O 10% Occasional

**B - Black-billed Cuckoo** *(Coccyzus erythropthalmus)* **SOC** S M

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC11; BCC17** FWP SWAP: **SGCN3, SGIN** PIF: **2**

**Predictive Models:** L 23% Low (inductive) **Associated Habitats:** C 10% Common

**B - Ferruginous Hawk** *(Buteo regalis)* **SOC** S M

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC10; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

**Predictive Models:** L 18% Low (inductive) **Associated Habitats:** C 21% Common, O 1% Occasional

**B - Short-eared Owl** *(Asio flammeus)* **PSOC** Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S4** USFWS: **MBTA; BCC11; BCC17** PIF: **3**

**Predictive Models:** L 16% Low (inductive) **Associated Habitats:** C 33% Common, O 5% Occasional

**B - Black-backed Woodpecker** *(Picoides arcticus)* **SOC** Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA**
USFS: **Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**

**Predictive Models:** L 15% Low (inductive) **Associated Habitats:** C 41% Common

**B - Black Tern** *(Chlidonias niger)* **SOC** S M

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G4G5** State: **S3B** USFWS: **MBTA; BCC11** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

**Predictive Models:** L 15% Low (inductive) **Associated Habitats:** C 1% Common, O 4% Occasional

**V - Elodea bifoliata** *(Long-sheath Waterweed)* **SOC** Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G4G5** State: **S2?** MNPS: **3**

**Predictive Models:** L 11% Low (inductive) **Associated Habitats:** C 1% Common

**V - Cryptantha fendleri** *(Fendler Cat's-eye)* **SOC** Not Assigned Y

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S2** BLM: **SENSITIVE** MNPS: **2**

**Predictive Models:** L 11% Low (inductive)

**R - Greater Short-horned Lizard** *(Phrynosoma hernandesi)* **SOC** Y

View in Field Guide | View Predicted Models | View Associated Habitat | View Range Maps

USFS: **Sensitive - Known on Forests (CG)**
Species of Concern - Native Species Global: **G5** State: **S3** **Sensitive - Suspected on Forests (HLC)** BLM: **SENSITIVE**
FWP SWAP: **SGCN3, SGIN**

**Predictive Models:** L 3% Low (inductive) **Associated Habitats:** C 6% Common, O 8% Occasional

**V - Utricularia intermedia** *(Flatleaf Bladderwort)* **SOC** Not Assigned Y

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S2** USFS: **Sensitive - Known on Forests (KOOT)** MNPS: **3**

**Predictive Models:** L 2% Low (inductive)

**I - Boloria freija** *(Freija Fritillary)* **PSOC** Not Available Y

View in Field Guide | View Associated Habitat | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S3S5**

**Associated Habitats:** C 35% Common, O 3% Occasional

**V - Viguiera multiflora** *(Many-flowered Viguiera)* **SOC** Not Available Y

View in Field Guide | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G4G5** State: **S2S3** MNPS: **3**

**Associated Habitats:** C 32% Common

**B - Plumbeous Vireo** *(Vireo plumbeus)* **PSOC** Not Available S M

View in Field Guide | View Associated Habitat | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S3S4B** USFWS: **MBTA** PIF: **3**

**Associated Habitats:** C 31% Common, O 10% Occasional

**I - Polygonia progne** *(Gray Comma)* **SOC** Not Available Y

View in Field Guide | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S2**

**Associated Habitats:** C 27% Common, O 1% Occasional

**I - Euphydryas gillettii** *(Gillette's Checkerspot)* **SOC** Not Available Y

View in Field Guide | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G3** State: **S2**

**Associated Habitats:** C 25% Common, O 15% Occasional

**B - McCown's Longspur** *(Rhynchophanes mccownii)* **SOC** Not Available S M

View in Field Guide | View Associated Habitat | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

**Associated Habitats:** O 23% Occasional

**B - Loggerhead Shrike** *(Lanius ludovicianus)* **SOC** Not Available S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC10; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
**Associated Habitats:** C 21% Common, O 10% Occasional

**B - Northern Hawk Owl** *(Surnia ulula)* **SOC** Not Available WM

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3, SGIN**
**Associated Habitats:** C 20% Common, O 1% Occasional

**B - Sharp-tailed Grouse** *(Tympanuchus phasianellus)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **SX,S4** FWP SWAP: **SGCN1** PIF: **2**
**Associated Habitats:** C 19% Common, O 14% Occasional

**M - Bison** *(Bos bison)* **SOC** Not Available H

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S2** FWP SWAP: **SGCN2**
**Associated Habitats:** C 16% Common, O 1% Occasional

**B - Tennessee Warbler** *(Oreothlypis peregrina)* **PSOC** Not Available M

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S4B** USFWS: **MBTA**
**Associated Habitats:** C 16% Common

**V - Noccaea parviflora** *(Small-flowered Pennycress)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G3** State: **S3** MNPS: **3**
**Associated Habitats:** C 15% Common

**V - Eriogonum caespitosum** *(Mat Buckwheat)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2S3** MNPS: **3**
**Associated Habitats:** C 14% Common

**V - Primula incana** *(Mealy Primrose)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Sensitive - Known on Forests (BD)** **Sensitive - Historically known, not recently documented on Forests (CG)** MNPS: **2**
**Associated Habitats:** C 10% Common

**V - Aquilegia formosa** *(Sitka Columbine)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3**
**Associated Habitats:** C 9% Common

**B - Burrowing Owl** *(Athene cunicularia)* **SOC** Not Available S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC17** USFS: **Sensitive - Known on Forests (CG)** **Sensitive - Suspected on Forests (HLC)** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
**Associated Habitats:** C 8% Common, O 11% Occasional

**V - Veratrum californicum** *(California False-hellebore)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2** USFS: **Sensitive - Known on Forests (BD, BRT)** **Sensitive - Suspected on Forests (CG, HLC)**
**Associated Habitats:** C 8% Common

**B - Sagebrush Sparrow** *(Artemisiospiza nevadensis)* **SOC** Not Available S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC10; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
**Associated Habitats:** C 8% Common

**I - Colias gigantea** *(Giant Sulphur)* **PSOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3**
**Associated Habitats:** C 7% Common, O 5% Occasional

**B - Sprague's Pipit** *(Anthus spragueii)* **SOC** 7 Not Available S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G3G4** State: **S3B** USFWS: **MBTA; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
**Associated Habitats:** O 7% Occasional

**B - Franklin's Gull** *(Leucophaeus pipixcan)* **SOC** Not Available M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
**Associated Habitats:** C 6% Common, O 10% Occasional

**I - Aeshna constricta** *(Lance-tipped Darner)* **PSOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S1S3**
**Associated Habitats:** C 6% Common

**I - Aeshna eremita** *(Lake Darner)* **PSOC** Not Available Y S W

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S4**
**Associated Habitats:** C 6% Common

**B - White-faced Ibis** *(Plegadis chihi)* **SOC** Not Available S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
**Associated Habitats:** C 6% Common

**B - Gray-crowned Rosy-Finch** *(Leucosticte tephrocotis)* **SOC** Not Available W M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2B,S5N** USFWS: **MBTA** FWP SWAP: **SGCN2, SGIN**
**Associated Habitats:** C 6% Common

**B - Black-crowned Night-Heron** *(Nycticorax nycticorax)* **SOC** Not Available M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
**Associated Habitats:** C 6% Common

**I - Argia alberta** *(Paiute Dancer)* **PSOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G4** State: **S2S3**
**Associated Habitats:** C 5% Common, O 1% Occasional

**B - Black Rosy-Finch** *(Leucosticte atrata)* **SOC** Not Available Y S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S2** USFWS: **MBTA; BCC10** FWP SWAP: **SGCN2, SGIN** PIF: **2**
**Associated Habitats:** C 5% Common

**V - Atriplex truncata** *(Wedge-leaf Saltbush)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** MNPS: **3**
**Associated Habitats:** C 5% Common

**V - Castilleja exilis** *(Annual Indian Paintbrush)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5T5** State: **S2** MNPS: **2**
**Associated Habitats:** C 5% Common

**I - Argia vivida** *(Vivid Dancer)* **PSOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**
**Associated Habitats:** C 4% Common, O 7% Occasional

**I - Aeshna sitchensis** *(Zigzag Darner)* **PSOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S3**
**Associated Habitats:** C 4% Common, O 3% Occasional

**I - Erebia callias** *(Colorado Alpine)* **PSOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G4** State: **S2S3**
**Associated Habitats:** C 4% Common, O 3% Occasional

**I - Aeshna juncea** *(Sedge Darner)* **PSOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**
**Associated Habitats:** C 4% Common, O 1% Occasional

**I - Boloria frigga** *(Frigga Fritillary)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S1S2**
**Associated Habitats:** C 4% Common, O 1% Occasional

**I - Leucorrhinia borealis** *(Boreal Whiteface)* SOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S1**
**Associated Habitats:** C 4% Common, O 1% Occasional

**I - Oeneis bore** *(White-veined Arctic)* PSOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S3**
**Associated Habitats:** C 4% Common, O 1% Occasional

**I - Sympetrum madidum** *(Red-veined Meadowhawk)* PSOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S3**
**Associated Habitats:** C 4% Common, O 1% Occasional

**I - Oeneis melissa** *(Melissa Arctic)* PSOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S3**
**Associated Habitats:** C 4% Common

**I - Somatochlora semicircularis** *(Mountain Emerald)* PSOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**
**Associated Habitats:** C 4% Common

**M - Black-tailed Prairie Dog** *(Cynomys ludovicianus)* SOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** USFS: **Sensitive - Known on Forests (CG)** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
**Associated Habitats:** C 1% Common, O 31% Occasional

**I - Somatochlora minor** *(Ocellated Emerald)* PSOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
**Associated Habitats:** C 1% Common, O 10% Occasional

**I - Somatochlora hudsonica** *(Hudsonian Emerald)* PSOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
**Associated Habitats:** C 1% Common, O 6% Occasional

**B - Mountain Plover** *(Charadrius montanus)* SOC — Not Available — S M

View in Field Guide | View Associated Habitat | View Range Maps
Species of Concern - Native Species Global: **G3** State: **S2B** USFWS: **MBTA; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **1**
**Associated Habitats:** C 1% Common, O 6% Occasional

**I - Argia emma** *(Emma's Dancer)* PSOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**
**Associated Habitats:** C 1% Common, O 5% Occasional

**I - Erythemis collocata** *(Western Pondhawk)* SOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S1S2**
**Associated Habitats:** C 1% Common, O 5% Occasional

**I - Libellula saturata** *(Flame Skimmer)* PSOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
**Associated Habitats:** C 1% Common, O 5% Occasional

**B - Black-necked Stilt** *(Himantopus mexicanus)* SOC — Not Available — M

View in Field Guide | View Associated Habitat | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
**Associated Habitats:** C 1% Common, O 4% Occasional

**I - Enallagma clausum** *(Alkali Bluet)* PSOC — Not Available — Y

View in Field Guide | View Associated Habitat | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
**Associated Habitats:** C 1% Common, O 1% Occasional

**I - Rhionaeschna californica** *(California Darner)* PSOC — Not Available — Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**
**Associated Habitats:** C 1% Common, O 1% Occasional

**I - Enallagma civile** *(Familiar Bluet)* **PSOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
**Associated Habitats:** C 1% Common

**I - Rhionaeschna multicolor** *(Blue-eyed Darner)* **PSOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
**Associated Habitats:** C 1% Common

**V - Draba crassa** *(Thick-leaf Whitlow-grass)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G3G4** State: **S3** MNPS: **3**
**Associated Habitats:** C 1% Common

**V - Erigeron asperugineus** *(Idaho Fleabane)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S2** USFS: **Sensitive - Known on Forests (BD, BRT)** MNPS: **3**
**Associated Habitats:** C 1% Common

**V - Pedicularis pulchella** *(Mountain Lousewort)* **SOC** Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G3** State: **S3**
**Associated Habitats:** C 1% Common

**B - Blue-gray Gnatcatcher** *(Polioptila caerulea)* **SOC** Not Available S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2B** USFWS: **MBTA** USFS: **Sensitive - Known on Forests (CG)** BLM: **SENSITIVE** FWP SWAP: **SGCN2**
**Associated Habitats:** C 1% Common

**B - Caspian Tern** *(Hydroprogne caspia)* **SOC** Not Available M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **2**
**Associated Habitats:** C 1% Common

**B - Clark's Grebe** *(Aechmophorus clarkii)* **SOC** Not Available M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
**Associated Habitats:** C 1% Common

**B - Common Loon** *(Gavia immer)* **SOC** Not Available M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** USFS: **Sensitive - Known on Forests (KOOT, LOLO)** FWP SWAP: **SGCN3** PIF: **1**
**Associated Habitats:** C 1% Common

**B - Common Tern** *(Sterna hirundo)* **SOC** Not Available M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
**Associated Habitats:** C 1% Common

**B - Forster's Tern** *(Sterna forsteri)* **SOC** Not Available M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
**Associated Habitats:** C 1% Common

**B - Horned Grebe** *(Podiceps auritus)* **SOC** Not Available M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC11; BCC17** FWP SWAP: **SGCN3** PIF: **2**
**Associated Habitats:** C 1% Common

**R - Snapping Turtle** *(Chelydra serpentina)* **SOC** Not Available I

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN**
**Associated Habitats:** C 1% Common

**M - Black-footed Ferret** *(Mustela nigripes)* **SOC** Not Available H

**View in Field Guide** **View Associated Habitat** **View Range Maps**

**Species of Concern - Native Species** Global: **G1** State: **S1** USFWS: **LE; XN** USFS: **Endangered, Experimental Nonessential on Forests (CG)** BLM: **ENDANGERED** FWP SWAP: **SGCN1**

**Associated Habitats:** 1% Common

| Latitude | Longitude |
|---|---|
| 45.21690 | -111.15824 |
| 45.68098 | -111.28669 |

# Structured Surveys

## Summarized by: **20PRVT0049 Hwy191** *(Custom Area of Interest)*

The Montana Natural Heritage Program (MTNHP) records information on the locations where more than 80 different types of well-defined repeatable survey protocols capable of detecting an animal species or suite of animal species have been conducted by state, federal, tribal, university, or private consulting biologists. Examples of structured survey protocols tracked by MTNHP include: visual encounter and dip net surveys for pond breeding amphibians, point counts for birds, call playback surveys for selected bird species, visual surveys of migrating raptors, kick net stream reach surveys for macroinvertebrates, visual encounter cover object surveys for terrestrial mollusks, bat acoustic or mist net surveys, pitfall and/or snap trap surveys for small terrestrial mammals, track or camera trap surveys for large mammals, and trap surveys for turtles. Whenever possible, photographs of survey locations are stored in MTNHP databases.

MTNHP does not typically manage information on structured surveys for plants; surveys for invasive species may be a future exception.

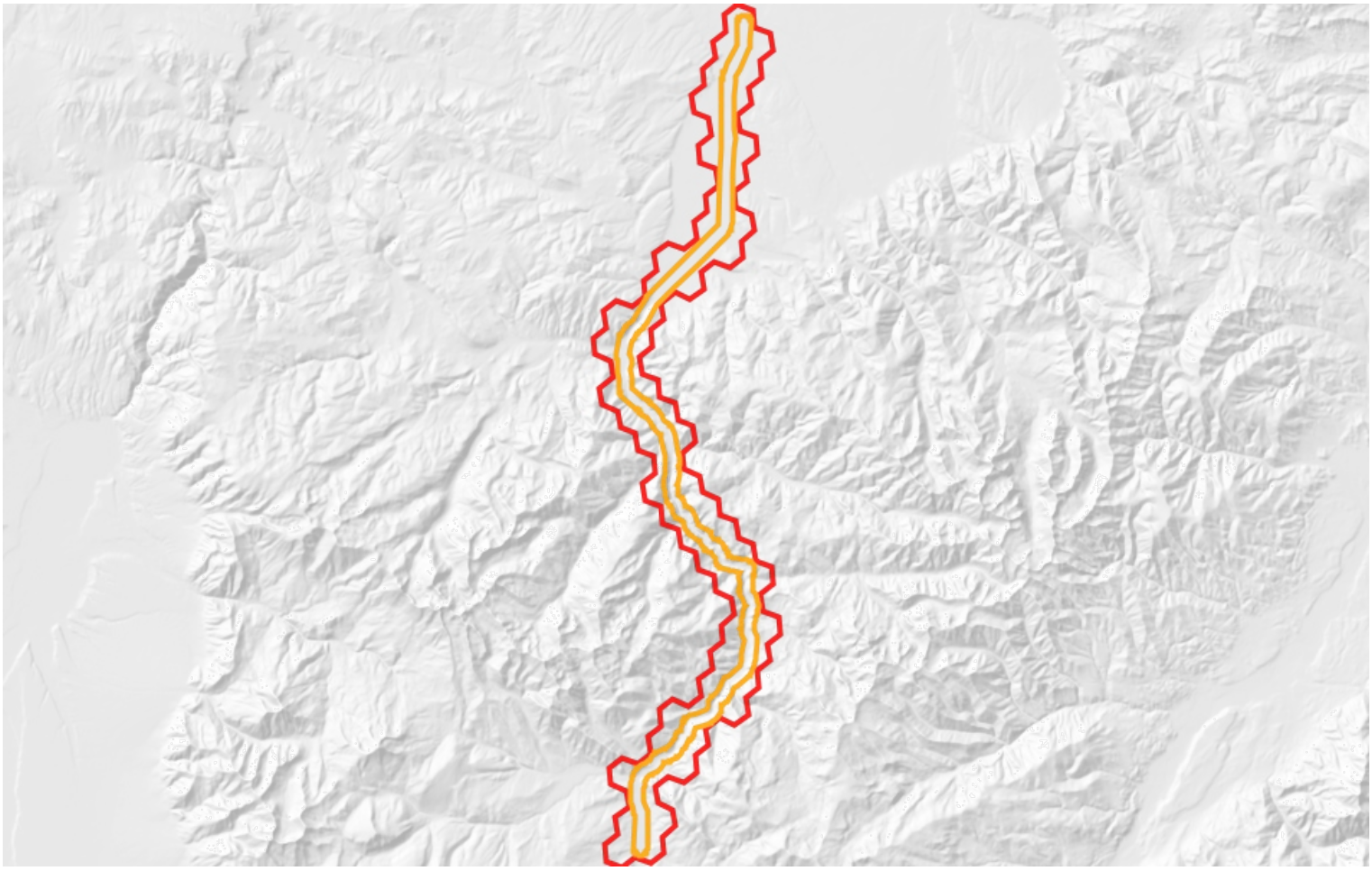
Within the report area you have requested, structured surveys are summarized by the number of each type of structured survey protocol that has been conducted, the number of species detections/observations resulting from these surveys, and the most recent year a survey has been conducted.

| | | | |
|---|---|---|---|
| **A-Nocturnal Calling Amphibian** *(Nocturnal Breeding Amphibian Calling Survey)* | **Survey Count**: 6 | **Obs Count**: | **Recent Survey**: 2010 |
| **AR-Amphibian/Reptile Lentic** *(Lentic Amphibian/Reptile Surveys)* | **Survey Count**: 17 | **Obs Count**: 17 | **Recent Survey**: 2010 |
| **B-Bald Eagle Nest** *(Bald Eagle Nest Survey)* | **Survey Count**: 10 | **Obs Count**: 9 | **Recent Survey**: 2014 |
| **B-Point Count** *(Bird Point Count)* | **Survey Count**: 18 | **Obs Count**: 127 | **Recent Survey**: 2004 |
| **B-Raptor nest** *(Raptor Nest Survey)* | **Survey Count**: 25 | **Obs Count**: 25 | **Recent Survey**: 2017 |
| **E-Eastern Heath Snail** *(Eastern Heath Snail Survey)* | **Survey Count**: 6 | **Obs Count**: | **Recent Survey**: 2012 |
| **E-Eurasian Water-milfoil Rake** *(Rake tows/pulls for Eurasian Water-milfoil)* | **Survey Count**: 3 | **Obs Count**: | **Recent Survey**: 2017 |
| **E-Invasive Mussel Plankton Tow** *(Plankton tows for veligers of Invasive Mussels)* | **Survey Count**: 14 | **Obs Count**: | **Recent Survey**: 2018 |
| **E-Kicknet** *(Kicknet Collection Survey for Invasive Mussels and Snails)* | **Survey Count**: 6 | **Obs Count**: | **Recent Survey**: 2018 |
| **E-Noxious Weed, Road-based** *(Noxious Weed Road-based Visual Surveys)* | **Survey Count**: 43 | **Obs Count**: 140 | **Recent Survey**: 2004 |
| **E-Noxious Weed, Visual** *(Noxious Weed Visual Surveys)* | **Survey Count**: 3 | **Obs Count**: 42 | **Recent Survey**: 2009 |
| **E-Visual Aquatic Invasives** *(Visual Encounter Surveys for Aquatic Invasives on Shorelines or Underwater)* | **Survey Count**: 6 | **Obs Count**: | **Recent Survey**: 2018 |
| **F-Fish Electrofishing** *(Fish Electrofishing Surveys)* | **Survey Count**: 12 | **Obs Count**: 21 | **Recent Survey**: 2015 |
| **F-Fish Other Survey** *(Fish Other Survey (FWP Survey Type))* | **Survey Count**: 5 | **Obs Count**: 7 | **Recent Survey**: 1980 |
| **F-Fish Visual** *(Fish Visual Survey)* | **Survey Count**: 2 | **Obs Count**: | **Recent Survey**: 1999 |
| **I-Aquatic Invert Lotic Dipnet** *(Invertebrate Lotic Site Dipnet and Visual Encounter Survey)* | **Survey Count**: 7 | **Obs Count**: 84 | **Recent Survey**: 2007 |
| **I-Bumble Bee** *(Bumble Bee Collection Surveys)* | **Survey Count**: 4 | **Obs Count**: 5 | **Recent Survey**: 2015 |
| **I-Land Mollusk VES** *(Terrestrial Mollusk Visual Encounter Survey)* | **Survey Count**: 3 | **Obs Count**: 8 | **Recent Survey**: 2009 |
| **I-Mussel** *(Stream Mussel Survey)* | **Survey Count**: 8 | **Obs Count**: | **Recent Survey**: 2008 |
| **M-Bat Acoustic** *(Bat Acoustic Survey)* | **Survey Count**: 9 | **Obs Count**: 10 | **Recent Survey**: 2010 |
| **M-Bat Hibernacula** *(Bat Roost (Hibernacula) Survey)* | **Survey Count**: 3 | **Obs Count**: 2 | **Recent Survey**: 2017 |
| **M-Bat Mistnet** *(Bat Mistnet Survey)* | **Survey Count**: 2 | **Obs Count**: 6 | **Recent Survey**: 2005 |
| **M-SMammal Snap/Sherman/Pitfall** *(Small Mammal Snap, Sherman, and Pitfall Trap Survey)* | **Survey Count**: 3 | **Obs Count**: 7 | **Recent Survey**: 2010 |
| **P-USFS ECODATA Plot** *(USFS ECODATA Ecological Inventory Survey Plot)* | **Survey Count**: 14 | **Obs Count**: 86 | **Recent Survey**: 1995 |
| **P-Veg Plot** *(Unspecified Vegetation Plot)* | **Survey Count**: 10 | **Obs Count**: 264 | **Recent Survey**: 1993 |
| **R-Reptile VES** *(Visual Encounter Surveys for Reptiles)* | **Survey Count**: 2 | **Obs Count**: 1 | **Recent Survey**: 2010 |

| Latitude | Longitude |
|---|---|
| 45.21690 | -111.15824 |
| 45.68098 | -111.28669 |

# Land Cover

Summarized by: **20PRVT0049 Hwy191** *(Custom Area of Interest)*



**25% (*9,786 Acres*)**

## Forest and Woodland Systems

### Conifer-dominated forest and woodland (xeric-mesic)

### Rocky Mountain Montane Douglas-fir Forest and Woodland

In Montana, this ecological system occurs on the east side of the Continental Divide, north to about the McDonald Pass area, and along the Rocky Mountain Front. This system is associated with a dry to submesic continental climate regime with annual precipitation ranging from 51 to 102 centimeters (20-40 inches), with a maximum in winter or late spring. Winter snowpacks typically melt off in early spring at lower elevations. Elevations range from valley bottoms to 1,980 meters (6500 feet) in northern Montana and up to 2,286 meters (7500 feet) on warm aspects in southern Montana. It occurs on north-facing aspects in most areas, and south-facing aspects at higher elevations. This is a Douglas-fir (*Pseudotsuga menziesii*) dominated system without any maritime floristic composition. Fire disturbance intervals are as infrequent as 500 years, and as a result, individual trees and forests can attain great age on some sites (500 to 1,500 years). In Montana, this system occurs from lower montane to lower subalpine environments and is prevalent on calcareous substrates. Common understory shrubs include common ninebark (*Physocarpus malvaceus*), common juniper (*Juniperus communis*), Rocky Mountain juniper (*Juniperus scopulorum*), birch-leaf spiraea (*Spiraea betulifolia*), snowberry (*Symphoricarpos* species), creeping Oregon grape (*Mahonia repens*) and Canadian buffaloberry (*Shepherdia canadensis*). The Douglas-fir/pinegrass (C*alamogrostis rubescens*) type is the most ubiquitous association found within this system in Montana.

10% (*3,889 Acres*)

## Forest and Woodland Systems
### Conifer-dominated forest and woodland (xeric-mesic)

#### Rocky Mountain Lodgepole Pine Forest

This forested system is widespread in upper montane to subalpine zones of the Montana Rocky Mountains, and east into island ranges of north-central Montana and the Bighorn and Beartooth ranges of south-central Montana. These are montane to subalpine forests where the dominance of lodgepole pine (*Pinus contorta*) is related to fire history and topoedaphic conditions. In Montana, elevation ranges from 975 to 2,743 meters (3,200-9000 feet). These forests occur on flats to slopes of all degrees and aspect, as well as valley bottoms. Fire is frequent, and stand-replacing fires are common. Following stand-replacing fires, lodgepole pinewill rapidly colonize and develop into dense, even-aged stands. Most forests in this ecological system occur as early- to mid-successional forests persisting for 50-200 years on warmer, lower elevation forests, and 150-400 years in subalpine forests. They generally occur on dry to intermediate sites with a wide seasonal range of temperatures and long precipitation-free periods in summer. Snowfall is heavy and supplies the major source of soil water used for growth in early summer. Vigorous stands occur where the precipitation exceeds 533 millimeters (21 inches). These lodgepole forests are typically associated with rock types weathering to acidic substrates, such as granite and rhyolite. In west-central Montana ranges such the Big Belts and the Rocky Mountain Front, these forests are found on limestone substrates. These systems are especially well developed on the broad ridges and high valleys near and east of the Continental Divide. Succession proceeds at different rates, moving relatively quickly on low-elevation, mesic sites and particularly slowly in high-elevation forests such as those along the Continental Divide in Montana.

9% (*3,427 Acres*)

## Human Land Use
### Agriculture

#### Cultivated Crops

These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.

8% (*3,051 Acres*)

## Shrubland, Steppe and Savanna Systems
### Sagebrush Steppe

#### Montane Sagebrush Steppe

This system dominates the montane and subalpine landscape of southwestern Montana from valley bottoms to subalpine ridges and is found as far north as Glacier National Park. It can also be seen in the island mountain ranges of the north-central and south-central portions of the state. It primarily occurs on deep-soiled to stony flats, ridges, nearly flat ridgetops, and mountain slopes. In general, this system occurs in areas of gentle topography, fine soils, subsurface moisture or mesic conditions, within zones of higher precipitation and areas of snow accumulation. It occurs on all slopes and aspects, variable substrates and all soil types. The shrub component of this system is generally dominated by mountain big sagebrush (*Artemisia tridentata ssp. vaseyana*). Other co-dominant shrubs include silver sagebrush (*Artemisia cana ssp. viscidula)*, subalpine big sagebrush (*Artemisia tridentata ssp. spiciformis*), three tip sagebrush (*Artemisia tripartita* ssp*. tripartita*) and antelope bitterbrush (*Purshia tridentata*). Little sagebrush (*Artemisia arbuscula ssp. arbuscula*) shrublands are only found in southwestern Montana on sites with a perched water table. Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*) sites may be included within this system if occurrences are at montane elevations, and are associated with montane graminoids such as Idaho fescue (*Festuca idahoensis),* spike fescue (*Leucopoa kingii*), or poverty oatgrass (*Danthonia intermedia)*. In ares where sage has been eliminated by human activities like burning, disking or poisoning, other shrubs may be dominant, especially rubber rabbitbrush (*Ericameria nauseosa*), and green rabbitbrush (*Chrysothamnus viscidiflorus*). Because of the mesic site conditions, most occurrences support a diverse herbaceous undergrowth of grasses and forbs. Shrub canopy cover is extremely variable, ranging from 10 percent to as high as 40 or 50 percent.

6% (*2,322 Acres*)

## Grassland Systems
### Montane Grassland

#### Rocky Mountain Lower Montane, Foothill, and Valley Grassland

This grassland system of the northern Rocky Mountains is found at lower montane to foothill elevations in mountains and valleys throughout Montana. These grasslands are floristically similar to Big Sagebrush Steppe but are defined by shorter summers, colder winters, and young soils derived from recent glacial and alluvial material. They are found at elevations from 548 - 1,650 meters (1,800-5,413 feet). In the lower montane zone, they range from small meadows to large open parks surrounded by conifers; below the lower treeline, they occur as extensive foothill and valley grasslands. Soils are relatively deep, fine-textured, often with coarse fragments, and non-saline. Microphytic crust may be present in high-quality occurrences. This system is typified by cool-season perennial bunch grasses and forbs (>25%) cover, with a sparse shrub cover (<10%). Rough fescue (*Festuca campestris*) is dominant in the northwestern portion of the state and Idaho fescue (*Festuca idahoensis*) is dominant or co-dominant throughout the range of the system. Bluebunch wheatgrass (*Pseudoroegneria spicata*) occurs as a co-dominant throughout the range as well, especially on xeric sites. Western wheatgrass (*Pascopyrum smithii*) is consistently present, often with appreciable coverage (>10%) in lower elevation occurrences in western Montana and virtually always present, with relatively high coverages (>25%), on the edge of the Northwestern Great Plains region. Species diversity ranges from a high of more than 50 per 400 square meter plot on mesic sites to 15 (or fewer) on xeric and disturbed sites. Most occurrences have at least 25 vascular species present. Farmland conversion, noxious species invasion, fire suppression, heavy grazing and oil and gas development are major threats to this system.

5% (*2,028 Acres*)

## Wetland and Riparian Systems
### Floodplain and Riparian
### Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland

This ecological system is found throughout the Rocky Mountain and Colorado Plateau regions. In Montana, it ranges from approximately 945 to 2,042 meters (3,100 to 6,700 feet), characterristically occuring as a mosaic of multiple communities that are tree-dominated with a diverse shrub component. It is dependent on a natural hydrologic regime, especially annual to episodic flooding. Occurrences are found within the flood zone of rivers, on islands, sand or cobble bars, and on immediate streambanks. It can form large, wide occurrences on mid-channel islands in larger rivers or narrow bands on small, rocky canyon tributaries and well-drained benches. It is also typically found in backwater channels and other perennially wet but less scoured sites, such as floodplains swales and irrigation ditches. In some locations, occurrences extend into moderately high intermountain basins where the adjacent vegetation is sage steppe. Dominant trees may include boxelder maple (*Acer negundo*), narrowleaf cottonwood (*Populus angustifolia*), Plains cottonwood (*Populus deltoides*), Douglas-fir (*Pseudotsuga menziesii*), peachleaf willow (*Salix amygdaloides*), or Rocky Mountain juniper (*Juniperus scopulorum*). Dominant shrubs include Rocky Mountain maple (*Acer glabrum*), thinleaf alder (*Alnus incana*), river birch (*Betula occidentalis*), redoiser dogwood (*Cornus sericea*), hawthorne (*Crataegus spp.*), chokecherry (*Prunus virginiana*), skunkbush sumac (*Rhus trilobata*), Drummondâ€™s willow (*Salix drummondiana*), sandbar willow (*Salix exigua*), Pacific willow (*Salix lucida*), rose (*Rosa* species), silver buffaloberry (*Shepherdia argentea*), or snowberry (*Symphoricarpos* species). Exotic trees of Russian olive (*Elaeagnus angustifolia*) and saltcedar (*Tamarix* species) may invade some stands in southeastern and south-central Montana.

4% (*1,742 Acres*)

## Forest and Woodland Systems
### Conifer-dominated forest and woodland (xeric-mesic)
### Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland

Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*) make up a substantial part of the montane and lower subalpine forests of the Montana Rocky Mountains and mountain island ranges of north-central and west-central Montana. Spruceis usually associated with fir and occurs as either a climax co-dominant or as a persistent, long-lived seral species in most upper elevation firhabitat types. Dry to mesic spruce-dominated forests range from 884-1,585 meters (2,900-5,200 feet) west of the Continental Divide, and 1585-2,073 meters (5,200-6,800 feet) east of the Continental Divide in the northern and central portions of the state. This system can be found at elevations up to 2,896 meters (9,500 feet) in southwestern Montana. Forests are found on gentle to very steep mountain slopes, high-elevation ridge tops and upper slopes, plateau-like surfaces, basins, alluvial terraces, well-drained benches, and inactive stream terraces. Tree canopy characteristics are relatively uniform. In northern Montana, Engelmann spruce hybridizes with its boreal counterpart, white spruce (*Picea glauca*). Douglas-fir (*Pseudotsuga menziesii*), lodgepole pine (*Pinus contorta*), and western larch (*Larix occidentalis*) (west of the Continental Divide) are seral but often present in these forests. The understory is comprised of a mixture of shrubs, forbs and graminoids tolerant of warmer and drier soil conditions than those found on the more mesic to wet spruce-fir system. The drier occurrences of this system are especially common on steep slopes at upper elevations throughout the easten Rocky Mountains, whereas the more mesic occurrences form substantial cover west of the Continental Divide in the Flathead, Lolo, Bitteroot and Kootenai river drainages.

4% (*1,739 Acres*)

## Human Land Use
### Developed
### Developed, Open Space

Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Impervious surfaces account for less than 20% of total cover. This category often includes highway and railway rights of way and graveled rural roads.

4% (*1,733 Acres*)

## Wetland and Riparian Systems
### Wet meadow
### Alpine-Montane Wet Meadow

These moderate-to-high-elevation systems are found throughout the Rocky Mountains, dominated by herbaceous species found on wetter sites with very low-velocity surface and subsurface flows. Occurrences range in elevation from montane to alpine at 1,000 to 3,353 meters (3,280-11,000 feet). This system typically occurs in cold, moist basins, seeps and alluvial terraces of headwater streams or as a narrow strip adjacent to alpine lakes (Hansen et al., 1996). Wet meadows are typically found on flat areas or gentle slopes, but may also occur on sub-irrigated sites with slopes up to 10 percent. In alpine regions, sites are typically small depressions located below late-melting snow patches or on snowbeds. The growing season may only last for one to two months. Soils of this system may be mineral or organic. In either case, soils show typical hydric soil characteristics, including high organic content and/or low chroma and redoximorphic features. This system often occurs as a mosaic of several plant associations, often dominated by graminoids such as tufted hairgrass (*Deschampsia caespitosa*), and a diversity of montane or alpine sedges such as small-head sedge (*Carex illota*), small-winged sedge (*Carex microptera*), black alpine sedge (*Carex nigricans*), Holmâ€™s Rocky Mountain sedge (*Carex scopulorum*) shortstalk sedge (*Carex podocarpa*) and Paysonâ€™s sedge (*Carex paysonis*). Drummondâ€™s rush (*Juncus drummondii*), Mertenâ€™s rush (*Juncus mertensianus*), and high elevation bluegrasses (*Poa arctica* and *Poa alpina*) are often present. Forbs such as arrow-leaf groundsel (*Senecio triangularis*), slender-sepal marsh marigold (*Caltha leptosepala*), and spreading globeflower (*Trollius laxus*) often form high cover in higher elevation meadows. Wet meadows are associated with snowmelt and are usually not subjected to high disturbance events such as flooding.

4% (*1,669 Acres*)

## Forest and Woodland Systems
### Deciduous dominated forest and woodland
### Aspen Forest and Woodland

This widespread ecological system is more common in the southern and central Rocky Mountains, but occurs in the montane and subalpine zones throughout much of Montana north into Canada. It is similar to the Inter-Mountain Basins Aspen Mixed Conifer Forest-Woodland found in the Big Snowy Mountains, but lacks the conifer component. Distribution of this system is primarily limited by adequate soil moisture required to meet its high evapotranspirative demand, length of growing season, and temperatures. Mean annual precipitation where these systems occur is generally greater than 38 centimeters (15 inches) and typically greater than 51 centimeters (20 inches), except in semi-arid environments where occurrences are restricted to mesic microsites such as seeps or areas below large snow drifts. Stands can occur on gentle to moderate slopes, in swales, or on level sites. At lower elevations, occurrences are found on cooler, north aspects and mesic sites. Soils are usually deep and well developed with rock often absent from the soil. Soil texture ranges from sandy loam to clay loams. This system describes mesic forests and woodlands dominated by quaking aspen (*Populus tremuloides*) without a significant conifer component (<25% relative tree cover). This aspen system can be stable and long-lived with little encroachment of coniferous species. The understory structure may be complex with multiple shrub and herbaceous layers, or simple, with just an herbaceous layer. The herbaceous layer may be dense or sparse, dominated by mesic grasses or forbs. Occurrences of this system often originate, and are likely maintained, by stand-replacing disturbances such as crown fire, disease, windthrow, elk and beaver activity.

No Image

3% (*1,255 Acres*)

## Human Land Use
### Developed
### Other Roads

County, city and or rural roads generally open to motor vehicles.

3% (*1,067 Acres*)

## Human Land Use
### Developed
### Low Intensity Residential

Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-50% of total cover. These areas most commonly include single-family housing units in rural and suburban areas. Paved roadways may be classified into this category.

3% (*1,015 Acres*)

## Grassland Systems
### Montane Grassland
### Rocky Mountain Subalpine-Montane Mesic Meadow

This system is restricted to sites from lower montane to subalpine elevations where finely textured soils, snow deposition, or windswept conditions limit tree establishment. Many occurrences are small patches, and are often found in mosaics within woodlands, dense shrublands, or just below alpine communities. Elevations range from 600 to2,011 meters (2,000-6,600 feet) in the northern Rocky Mountains and up to 2,286- 2,682 meters (7,500-8,800 feet) in the mountains of southwestern Montana. This system occurs on gentle to moderate-gradient slopes and in relatively moist habitats. Soils are typically seasonally moist to saturated in the spring, but dry out later in the growing season. At montane elevations, soils are usually clays or silt loams, and some occurrences may have inclusions of hydric soils in low, depressional areas. At subalpine elevations, soils are derived a variety of parent materials, and are usually rocky or gravelly with good aeration and drainage, but with a well developed organic layer. Some occurrences are more heavily dominated by grasses, while others are more dominated by forbs. Common grasses include tufted hairgrass (*Deschampsia caespitosa*), showy oniongrass (*Melica spectabilis*), mountain brome (*Bromus carinatus*), blue wildrye (*Elymus glaucus*), awned sedge (*Carex atherodes*), and small wing sedge (*Carex microptera*). Forb dominated meadows usually comprise a wide species diversity which differs from montane to subalpine elevations. Shrubs such as shrubby cinquefoil (*Dasiphora fruticosa* ssp. *floribunda*) and snowberry (*Symphoricarpos* species) are occasional but not abundant. This system differs from the Rocky Mountain Alpine Montane Wet Meadow system in that it soils dry out by mid-summer.

**Additional Limited Land Cover**

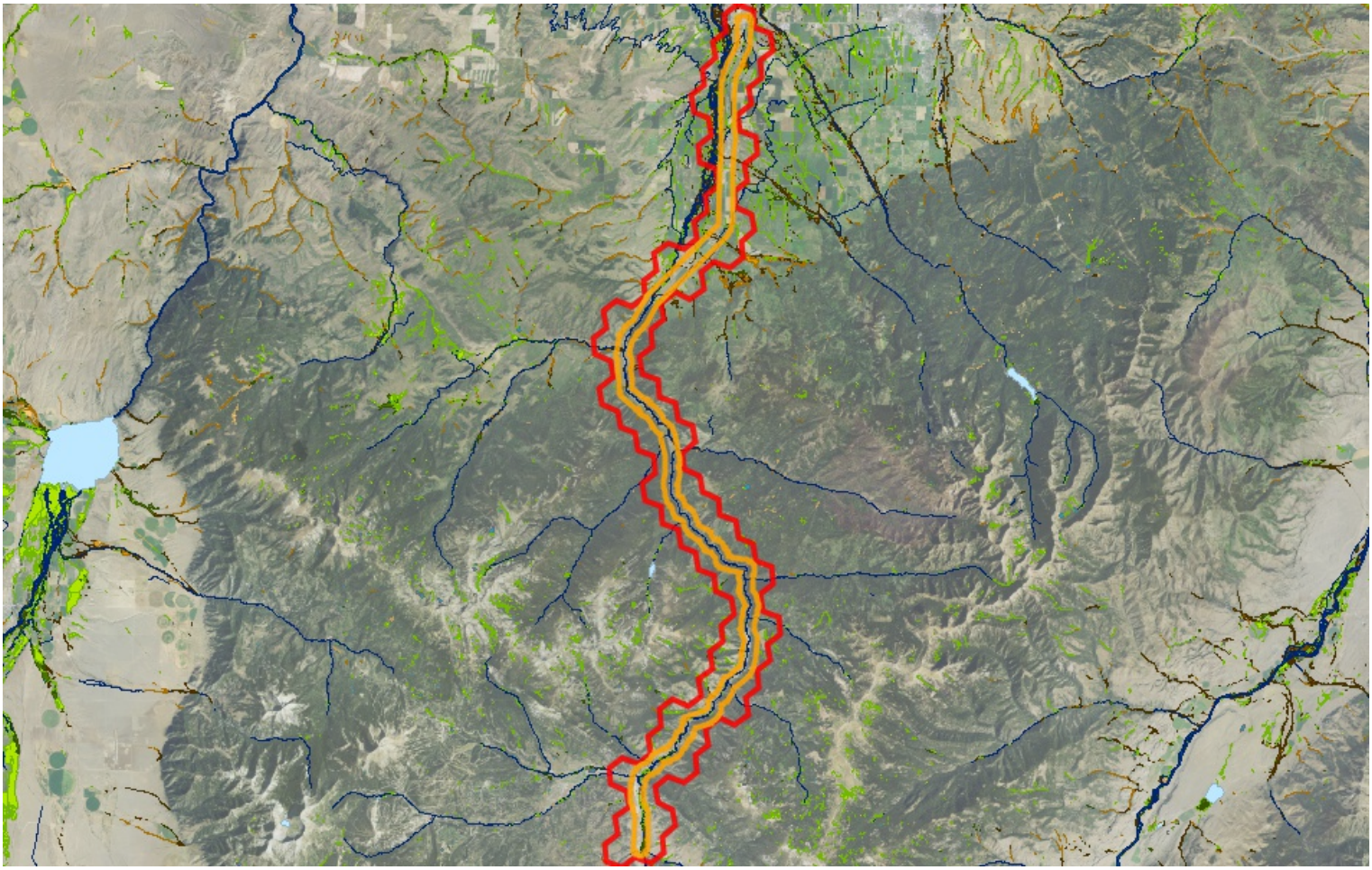
1% (*561 Acres*) Open Water
1% (*534 Acres*) Major Roads
1% (*469 Acres*) Rocky Mountain Montane-Foothill Deciduous Shrubland
1% (*456 Acres*) Commercial / Industrial
1% (*402 Acres*) Rocky Mountain Subalpine Deciduous Shrubland
1% (*366 Acres*) Insect-Killed Forest
1% (*317 Acres*) Rocky Mountain Cliff, Canyon and Massive Bedrock
1% (*270 Acres*) Pasture/Hay
1% (*222 Acres*) Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland
1% (*204 Acres*) Rocky Mountain Subalpine-Upper Montane Grassland
1% (*200 Acres*) Introduced Upland Vegetation - Annual and Biennial Forbland
<1% (*103 Acres*) High Intensity Residential
<1% (*60 Acres*) Recently burned forest
<1% (*50 Acres*) Harvested forest-tree regeneration
<1% (*16 Acres*) Harvested forest-grass regeneration

<1% (*14 Acres*) Emergent Marsh
<1% (*11 Acres*) Burned Sagebrush
<1% (*10 Acres*) Harvested forest-shrub regeneration
<1% (*10 Acres*) Aspen and Mixed Conifer Forest
<1% (*9 Acres*) Post-Fire Recovery
<1% (*4 Acres*) Big Sagebrush Steppe
<1% (*4 Acres*) Recently burned shrubland
<1% (*3 Acres*) Low Sagebrush Shrubland
<1% (*2 Acres*) Rocky Mountain Foothill Limber Pine - Juniper Woodland
<1% (*2 Acres*) Alpine Bedrock and Scree
<1% (*0 Acres*) Rocky Mountain Lower Montane-Foothill Shrubland

| Latitude | Longitude |
|---|---|
| 45.21690 | -111.15824 |
| 45.68098 | -111.28669 |

# Wetland and Riparian

Summarized by: **20PRVT0049 Hwy191** *(Custom Area of Interest)*



## Wetland and Riparian Mapping

Explain

### P - Palustrine

**AB - Aquatic Bed**

| | | |
|---|---|---|
| F - Semipermanently Flooded | 25 Acres | |
| (no modifier) | **4 Acres** | **PABF** |
| h - Diked/Impounded | **2 Acres** | **PABFh** |
| x - Excavated | **19 Acres** | **PABFx** |
| G - Intermittently Exposed | 19 Acres | |
| (no modifier) | **6 Acres** | **PABG** |
| x - Excavated | **13 Acres** | **PABGx** |
| K - Artificially Flooded | 5 Acres | |
| x - Excavated | **5 Acres** | **PABKx** |

**P - Palustrine, AB - Aquatic Bed**
*Wetlands with vegetation growing on or below the water surface for most of the growing season.*

**US - Unconsolidated Shore**

| | | |
|---|---|---|
| A - Temporarily Flooded | <1 Acres | |
| (no modifier) | **<1 Acres** | **PUSA** |
| C - Seasonally Flooded | 2 Acres | |
| (no modifier) | **2 Acres** | **PUSC** |

**P - Palustrine, US - Unconsolidated Shore**
*Wetlands with less than 75% areal cover of stones, boulders, or bedrock. AND with less than 30% vegetative cover AND the wetland is irregularly exposed due to seasonal or irregular flooding and subsequent drying.*

**EM - Emergent**

| | | |
|---|---|---|
| A - Temporarily Flooded | 493 Acres | |
| (no modifier) | **466 Acres** | |

**P - Palustrine, EM - Emergent**
*Wetlands with erect, rooted herbaceous vegetation present during most of the growing season.*

PEMA
x - Excavated **27 Acres** PEMAx

C - Seasonally Flooded 151 Acres
(no modifier) **97 Acres** PEMC
h - Diked/Impounded **1 Acres** PEMCh
x - Excavated **53 Acres** PEMCx

F - Semipermanently Flooded 2 Acres
(no modifier) **1 Acres** PEMF
h - Diked/Impounded **<1 Acres** PEMFh
x - Excavated **1 Acres** PEMFx

SS - Scrub-Shrub

**P - Palustrine, SS - Scrub-Shrub**
*Wetlands dominated by woody vegetation less than 6 meters (20 feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental conditions.*

A - Temporarily Flooded 137 Acres
(no modifier) **133 Acres** PSSA
x - Excavated **4 Acres** PSSAx

C - Seasonally Flooded 14 Acres
(no modifier) **8 Acres** PSSC
x - Excavated **6 Acres** PSSCx

FO - Forested

**P - Palustrine, FO - Forested**
*Wetlands dominated by woody vegetation greater than 6 meters (20 feet) tall.*

A - Temporarily Flooded 5 Acres
(no modifier) **5 Acres** PFOA

## R - Riverine (Rivers)

### 2 - Lower Perennial

UB - Unconsolidated Bottom

**R - Riverine (Rivers), 2 - Lower Perennial, UB - Unconsolidated Bottom**
*Stream channels where the substrate is at least 25% mud, silt or other fine particles.*

F - Semipermanently Flooded 15 Acres
(no modifier) **3 Acres** R2UBF
x - Excavated **12 Acres** R2UBFx

G - Intermittently Exposed 1 Acres
(no modifier) **1 Acres** R2UBG

H - Permanently Flooded 333 Acres
(no modifier) **333 Acres** R2UBH

US - Unconsolidated Shore

**R - Riverine (Rivers), 2 - Lower Perennial, US - Unconsolidated Shore**
*Shorelines with less than 75% areal cover of stones, boulders, or bedrock and less than 30% vegetation cover. The area is also irregularly exposed due to seasonal or irregular flooding and subsequent drying.*

A - Temporarily Flooded 35 Acres
(no modifier) **35 Acres** R2USA

C - Seasonally Flooded 26 Acres
(no modifier) **26 Acres** R2USC

### 3 - Upper Perennial

UB - Unconsolidated Bottom

**R - Riverine (Rivers), 3 - Upper Perennial, UB - Unconsolidated Bottom**
*Stream channels where the substrate is at least 25% mud, silt or other fine particles.*

F - Semipermanently Flooded 3 Acres
x - Excavated **3 Acres** R3UBFx

G - Intermittently Exposed 6 Acres
(no modifier) **6 Acres** R3UBG

H - Permanently Flooded 187 Acres
(no modifier) **187 Acres** R3UBH

US - Unconsolidated Shore

**R - Riverine (Rivers), 3 - Upper Perennial, US - Unconsolidated Shore**
*Shorelines with less than 75% areal cover of stones, boulders, or bedrock and less than 30% vegetation cover. The area is also irregularly exposed due to seasonal or irregular flooding and subsequent drying.*

A - Temporarily Flooded 6 Acres
(no modifier) **6 Acres** R3USA

C - Seasonally Flooded 1 Acres
(no modifier) **1 Acres** R3USC

### 4 - Intermittent

SB - Stream Bed

**R - Riverine (Rivers), 4 - Intermittent, SB - Stream Bed**
*Active channel that contains periodic water flow.*

A - Temporarily Flooded 3 Acres
(no modifier) **3 Acres** R4SBA

C - Seasonally Flooded 20 Acres
(no modifier) **12 Acres** R4SBC
x - Excavated **8 Acres** R4SBCx

## Rp - Riparian

**1 - Lotic**

| | | |
|---|---|---|
| SS - Scrub-Shrub<br>(no modifier) | **142 Acres** Rp1SS | **Rp - Riparian, 1 - Lotic, SS - Scrub-Shrub**<br>*This type of riparian area is dominated by woody vegetation that is less than 6 meters (20 feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental conditions.* |
| FO - Forested<br>(no modifier) | **879 Acres** Rp1FO | **Rp - Riparian, 1 - Lotic, FO - Forested**<br>*This riparian class has woody vegetation that is greater than 6 meters (20 feet) tall.* |
| EM - Emergent<br>(no modifier) | **63 Acres** Rp1EM | **Rp - Riparian, 1 - Lotic, EM - Emergent**<br>*Riparian areas that have erect, rooted herbaceous vegetation during most of the growing season.* |

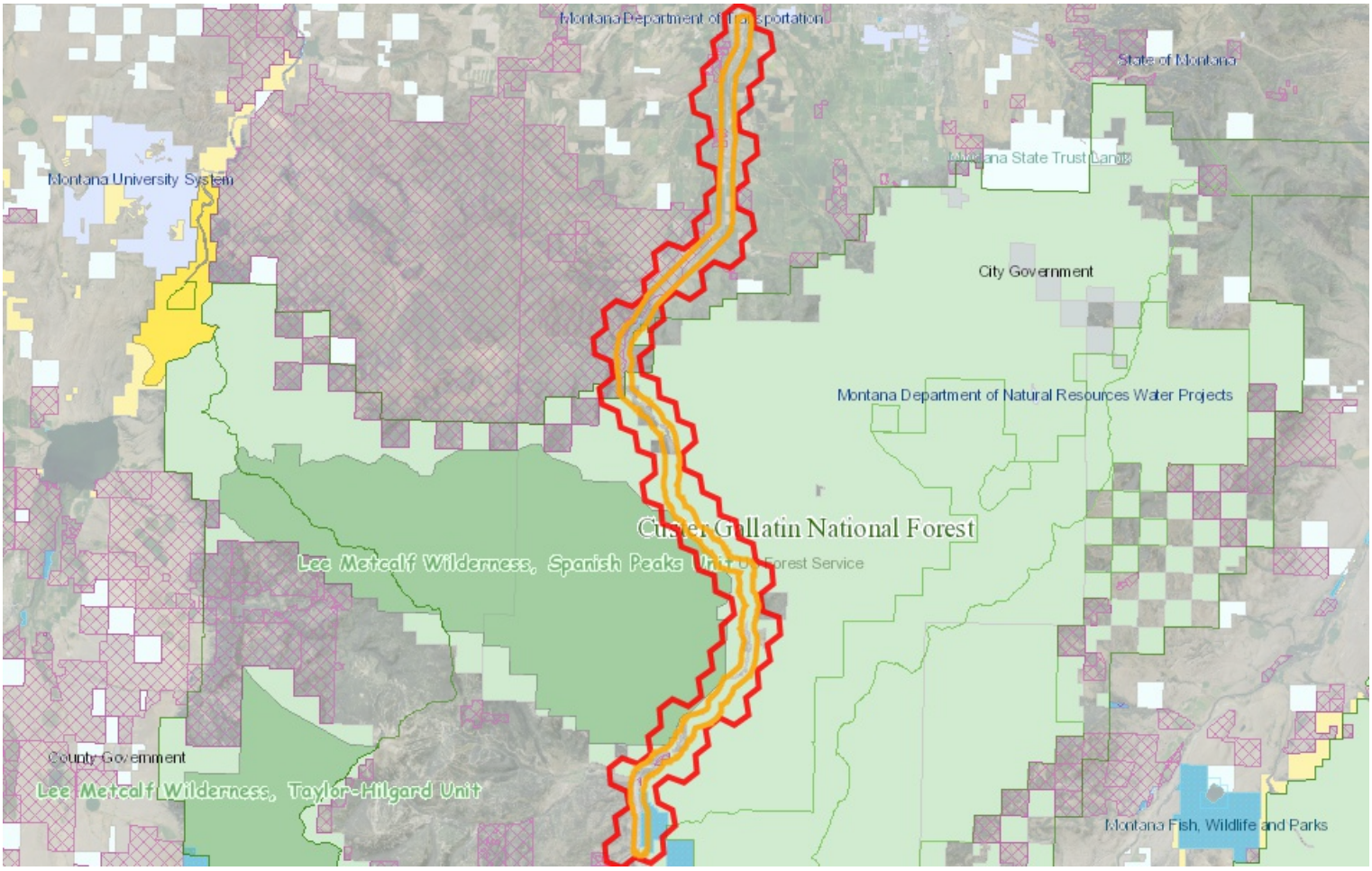
**2 - Lentic**

| | | |
|---|---|---|
| SS - Scrub-Shrub<br>(no modifier) | **<1 Acres** Rp2SS | **Rp - Riparian, 2 - Lentic, SS - Scrub-Shrub**<br>*This type of riparian area is dominated by woody vegetation that is less than 6 meters (20 feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental conditions.* |
| FO - Forested<br>(no modifier) | **1 Acres** Rp2FO | **Rp - Riparian, 2 - Lentic, FO - Forested**<br>*This riparian class has woody vegetation that is greater than 6 meters (20 feet) tall.* |

| Latitude | Longitude |
|---|---|
| 45.21690 | -111.15824 |
| 45.68098 | -111.28669 |

# Land Management

Summarized by: **20PRVT0049 Hwy191** *(Custom Area of Interest)*




## Land Management Summary

Explain

| | Ownership | Tribal | Easements | Other Boundaries (possible overlap) |
|---|---|---|---|---|
| **Public Lands** | **19,802 Acres (51%)** | | | |
| **Federal** | **18,876 Acres (48%)** | | | |
| **US Forest Service** | **18,876 Acres (48%)** | | | |
| **USFS Owned** | **18,876 Acres (48%)** | | | |
| **USFS Ranger Districts** | | | | **23,637 Acres** |
| Custer Gallatin National Forest, Bozeman Ranger District | | | | 23,637 Acres |
| **USFS National Forest Boundaries** | | | | **23,637 Acres** |
| Custer Gallatin National Forest | | | | 23,637 Acres |
| **USFS Wilderness Areas** | | | | **3,017 Acres** |
| Lee Metcalf Wilderness, Spanish Peaks Unit | | | | 3,017 Acres |
| **USFS Wilderness Study Areas** | | | | **20 Acres** |
| Hyalite-Porcupine-Buffalo Horn Wilderness Study Area | | | | 20 Acres |
| **State** | **925 Acres (2%)** | | | |
| **Montana Fish, Wildlife and Parks** | **925 Acres (2%)** | | | |
| **MTFWP Owned** | **925 Acres (2%)** | | | |
| **MTFWP Fishing Access Sites** | | | | **22 Acres** |
| Axtell Bridge Fishing Access Site | | | | 4 Acres |
| Kirk Wildlife Refuge Fishing Access Site | | | | 18 Acres |
| **MTFWP Wildlife Management Areas** | | | | **899 Acres** |

## Land Management Summary

Explain

| | Ownership | Tribal | Easements | Other Boundaries (possible overlap) |
|---|---|---|---|---|
| Gallatin Wildlife Management Area | | | | 899 Acres |
| Local | 1 Acres (<1%) | | | |
| Local Government | 1 Acres (<1%) | | | |
| Local Government Owned | 1 Acres (<1%) | | | |
| **Conservation Easements** | | | **4,897 Acres (13%)** | |
| Private | | | 4,897 Acres (13%) | |
| Montana Land Reliance | | | 572 Acres (1%) | |
| The Nature Conservancy | | | 4,219 Acres (11%) | |
| Gallatin Valley Land Trust | | | 106 Acres (<1%) | |
| **Private Lands or Unknown Ownership** | **14,323 Acres (37%)** | | | |

| Latitude | Longitude |
|---|---|
| 45.21690 | -111.15824 |
| 45.68098 | -111.28669 |

# Biological Reports

## Summarized by: **20PRVT0049 Hwy191** *(Custom Area of Interest)*

Within the report area you have requested, citations for all reports and publications associated with plant or animal observations in Montana Natural Heritage Program (MTNHP) databases are listed and, where possible, links to the documents are included.

The MTNHP plans to include reports associated with terrestrial and aquatic communities in the future as allowed for by staff resources. If you know of reports or publications associated with species or biological communities within the report area that are not shown in this report, please let us know: mtnhp@mt.gov


- Hinckley, Dan. 1985. ***Blackbook of Montana Peregrine Falcon Eyries***. BLM Spec. Rep.
- Hodgson, James R. 1970. Ecological distribution of Microtus montanus and Microtus pennsylvanicus in an area of geographic sympatry in southwestern Montana. M.S. Thesis, Montana State University, Bozeman.
- Rauscher, R.L. 2000. Tiger salamander axolotls in southwest Montana, final report. Bozeman, MT: Montana Department of Fish, Wildlife and Parks. 28p.
- Reichel, J. D., D. L. Genter, and D. P. Hendricks.Â 1997.Â ***Harlequin Duck research and monitoring in Montana: 1996***. Unpublished report, Montana Natural Heritage Program, Helena. 77 pp.
- Rogers, Ralph and Jay Sumner. 2004. Montana Peregrine Falcon Survey. Centmont Bioconsultants. Winifred, Montana. 32 pp plus appendix.
- Skaar, P.D. 1969. ***Birds of the Bozeman latilong***: a compilation of data concerning the birds which occur between 45 and 46 N. latitude and 111 and 112 W. longitude, with current lists for Idaho, Montana, Wyoming, impinging Montana counties and Yellowstone National Park. Bozeman, MT. 132 p.
- Sumner, J. and R. Rogers. 1999. Montana Peregrine Falcon Survey. prepared for Montana Fish, Wildlife & Parks. 27pp. (plus maps and photos).
- Sumner, J. and R. Rogers. 2001. Montana Peregrine Falcon Survey. prepared for Montana Fish, Wildlife & Parks. 22 pp.
- Sumner, J. and R. Rogers. 2002. Montana Peregrine Falcon Survey. prepared for Montana Fish, Wildlife & Parks. 29 pp plus appendix.
- Sumner, Jay and Ralph Rogers. 2006. Montana Peregrine Falcon Survey. Montana Peregrine Institute. Arlee, Montana. 36 pp plus appendix.

MONTANA Natural Heritage Program

A program of the **Montana State Library's Natural Resource Information System** operated by the **University of Montana**.

**Legend**

**Model Icons**
- N Suitable (native range)
- O Optimal Suitability
- M Moderate Suitability
- L Low Suitability
- I Suitable (introduced range)

**Habitat Icons**
- C Common
- O Occasional

**Range Icons**
- T Suspect (invasive / pest)
- D Documented (invasive / pest)
- R Released (biocontrol)
- E Established (biocontrol)

**Num Obs**
Count of obs with 'good precision' (<=1000m)
+ indicates additional 'poor precision' obs (1001m-10,000m)

| Latitude | Longitude |
|---|---|
| 45.21690 | -111.15824 |
| 45.68098 | -111.28669 |

# Invasive and Pest Species

## Summarized by: **20PRVT0049 Hwy191** *(Custom Area of Interest)*

| | # Obs | Predictive Model | Associated Habitat | Range |
|---|---|---|---|---|
| **Noxious Weeds: Priority 1A** | | | | |
| **V - Centaurea solstitialis** *(Yellow Starthistle)* N1A | | | Not Assigned | D |
| View in Field Guide · View Predicted Models · View Range Maps | | | | |
| Noxious Weed: Priority 1A - Non-native Species Global: **GNR** State: **SNA** | | | | |
| **Predictive Models:** M 67% Moderate (inductive), L 25% Low (inductive) | | | | |
| **V - Isatis tinctoria** *(Dyer's Woad)* N1A | | | Not Assigned | D |
| View in Field Guide · View Predicted Models · View Range Maps | | | | |
| Noxious Weed: Priority 1A - Non-native Species Global: **GNR** State: **SNA** | | | | |
| **Predictive Models:** M 15% Moderate (inductive), L 39% Low (inductive) | | | | |
| **Noxious Weeds: Priority 1B** | | | | |
| **V - Echium vulgare** *(Blueweed)* N1B | | | Not Assigned | D |
| View in Field Guide · View Predicted Models · View Range Maps | | | | |
| Noxious Weed: Priority 1B - Non-native Species Global: **GNR** State: **SNA** | | | | |
| **Predictive Models:** M 59% Moderate (inductive), L 39% Low (inductive) | | | | |
| **V - Chondrilla juncea** *(Rush Skeletonweed)* N1B | | | Not Assigned | D |
| View in Field Guide · View Predicted Models · View Range Maps | | | | |
| Noxious Weed: Priority 1B - Non-native Species Global: **GNR** State: **SNA** | | | | |
| **Predictive Models:** L 26% Low (inductive) | | | | |
| **V - Lythrum salicaria** *(Purple Loosestrife)* N1B | 1 | Not Available | Not Assigned | |
| View in Field Guide | | | | |
| Noxious Weed: Priority 1B - Non-native Species Global: **G5** State: **SNA** | | | | |
| **V - Polygonum cuspidatum** *(Japanese Knotweed)* N1B | 1 | Not Available | Not Assigned | |
| View in Field Guide | | | | |
| Noxious Weed: Priority 1B - Non-native Species Global: **GNR** State: **SNA** | | | | |
| **Noxious Weeds: Priority 2A** | | | | |
| **V - Hieracium praealtum** *(Kingdevil Hawkweed)* N2A | | | Not Assigned | D |
| View in Field Guide · View Predicted Models · View Range Maps | | | | |
| Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA** | | | | |
| **Predictive Models:** M 10% Moderate (inductive), L 69% Low (inductive) | | | | |
| **V - Hieracium caespitosum** *(Meadow Hawkweed)* N2A | 1 | | Not Assigned | D |
| View in Field Guide · View Predicted Models · View Range Maps | | | | |
| Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA** | | | | |
| **Predictive Models:** L 80% Low (inductive) | | | | |
| **V - Lepidium latifolium** *(Perennial Pepperweed)* N2A | | | Not Assigned | D |
| View in Field Guide · View Predicted Models · View Range Maps | | | | |
| Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA** | | | | |
| **Predictive Models:** L 79% Low (inductive) | | | | |
| **V - Hieracium aurantiacum** *(Orange Hawkweed)* N2A | 3 | | Not Assigned | D |
| View in Field Guide · View Predicted Models · View Range Maps | | | | |
| Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA** | | | | |
| **Predictive Models:** L 74% Low (inductive) | | | | |
| **V - Ranunculus acris** *(Tall Buttercup)* N2A | 1 | Not Available | Not Assigned | Y |
| View in Field Guide · View Range Maps | | | | |
| Noxious Weed: Priority 2A - Non-native Species Global: **G5** State: **SNA** | | | | |
| **Noxious Weeds: Priority 2B** | | | | |
| **V - Berteroa incana** *(Hoary False-alyssum)* N2B | 22 | | Not Assigned | D |
| View in Field Guide · View Predicted Models · View Range Maps | | | | |
| Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA** | | | | |
| **Predictive Models:** O 43% Optimal (inductive), M 57% Moderate (inductive) | | | | |
| **V - Linaria vulgaris** *(Yellow Toadflax)* N2B | 36 | | Not Assigned | D |

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** O 11% Optimal (inductive), M 80% Moderate (inductive), L 8% Low (inductive)

**V - Cynoglossum officinale** *(Common Hound's-tongue)* N2B — 111 — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** O 8% Optimal (inductive), M 92% Moderate (inductive)

**V - Lepidium draba** *(Whitetop)* N2B — 37 — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** O 8% Optimal (inductive), M 31% Moderate (inductive), L 52% Low (inductive)

**V - Centaurea stoebe** *(Spotted Knapweed)* N2B — 243 — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** M 89% Moderate (inductive), L 11% Low (inductive)

**V - Cirsium arvense** *(Canada Thistle)* N2B — 186 — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **G5** State: **SNA**
**Predictive Models:** M 64% Moderate (inductive), L 36% Low (inductive)

**V - Euphorbia virgata** *(Leafy Spurge)* N2B — 5 — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNRTNR** State: **SNA**
**Predictive Models:** M 52% Moderate (inductive), L 48% Low (inductive)

**V - Leucanthemum vulgare** *(Oxeye Daisy)* N2B — 75 — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** M 48% Moderate (inductive), L 52% Low (inductive)

**V - Linaria dalmatica** *(Dalmatian Toadflax)* N2B — 2 — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **G5** State: **SNA**
**Predictive Models:** M 41% Moderate (inductive), L 59% Low (inductive)

**V - Centaurea diffusa** *(Diffuse Knapweed)* N2B — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** M 39% Moderate (inductive), L 59% Low (inductive)

**V - Convolvulus arvensis** *(Field Bindweed)* N2B — 3 — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** M 30% Moderate (inductive), L 23% Low (inductive)

**V - Hypericum perforatum** *(Common St. John's-wort)* N2B — 5 — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** L 84% Low (inductive)

**V - Acroptilon repens** *(Russian Knapweed)* N2B — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** L 16% Low (inductive)

**V - Potentilla recta** *(Sulphur Cinquefoil)* N2B — 2 — Not Available — Not Assigned — D

View in Field Guide View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**

**V - Tanacetum vulgare** *(Common Tansy)* N2B — 21 — Not Available — Not Assigned — D

View in Field Guide View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**

**Regulated Weeds: Priority 3**

**V - Bromus tectorum** *(Cheatgrass)* R3 — 2 — Not Assigned — D

View in Field Guide View Predicted Models View Range Maps
Regulated Weed: Priority 3 - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** M 82% Moderate (inductive), L 18% Low (inductive)

**Biocontrol Species**

**I - Mecinus janthinus** *(Yellow Toadflax Stem-boring Weevil)* BIOCNTRL — Not Assigned — R

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** O 28% Optimal (inductive), M 8% Moderate (inductive), L 11% Low (inductive)

**I - Aphthona lacertosa** *(Brown-legged Leafy Spurge Flea Beetle)* **BIOCNTRL** Not Assigned R

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** M 44% Moderate (inductive), L 31% Low (inductive)

**I - Mecinus janthiniformis** *(Dalmatian Toadflax Stem-boring Weevil)* **BIOCNTRL** Not Assigned R

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** M 33% Moderate (inductive), L 66% Low (inductive)

**I - Oberea erythrocephala** *(Red-headed Leafy Spurge Stem Borer)* **BIOCNTRL** Not Assigned R

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** M 33% Moderate (inductive), L 54% Low (inductive)

**I - Cyphocleonus achates** *(Knapweed Root Weevil)* **BIOCNTRL** Not Assigned R

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** M 28% Moderate (inductive), L 23% Low (inductive)

**I - Aphthona nigriscutis** *(Black Dot Leafy Spurge Flea Beetle)* **BIOCNTRL** Not Assigned R

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
**Predictive Models:** M 16% Moderate (inductive), L 51% Low (inductive)

# Introduction to Montana Natural Heritage Program

P.O. Box 201800 • 1515 East Sixth Avenue • Helena, MT 59620-1800 • fax 406.444.0266 • tel 406.444.0241 • mtnhp.org

## Introduction

The Montana Natural Heritage Program (MTNHP) is Montana's source for reliable and objective information on Montana's native species and habitats, emphasizing those of conservation concern. MTNHP was created by the Montana legislature in 1983 as part of the Natural Resource Information System (NRIS) at the Montana State Library (MSL). MTNHP is "a program of information acquisition, storage, and retrieval for data relating to the flora, fauna, and biological community types of Montana" (MCA 90-15-102). MTNHP's activities are guided by statute (MCA 90-15) as well as through ongoing interaction with, and feedback from, principal data source agencies such as Montana Fish, Wildlife, and Parks, the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation, the Montana University System, the US Forest Service, and the US Bureau of Land Management. The enabling legislation for MTNHP provides the State Library with the option to contract the operation of the Program. Since 2006, MTNHP has been operated as a program under the Office of the Vice President for Research and Creative Scholarship at the University of Montana (UM) through a renewable 2-year contract with the MSL. Since the first staff was hired in 1985, the Program has logged a long record of success, and developed into a highly respected, service-oriented program. MTNHP is widely recognized as one of the most advanced and effective of over 80 natural heritage programs throughout the Western Hemisphere.

## Vision

Our vision is that public agencies, the private sector, the education sector, and the general public will trust and rely upon MTNHP as the source for information and expertise on Montana's species and habitats, especially those of conservation concern. We strive to provide easy access to our information in order for users to save time and money, speed environmental reviews, and inform decision making.

## Core Values

- We endeavor to be a single statewide source of accurate and up-to-date information on Montana's plants, animals, and aquatic and terrestrial biological communities.
- We actively listen to our data users and work responsively to meet their information and training needs.
- We strive to provide neutral, trusted, timely, and equitable service to all of our information users.
- We make every effort to be transparent to our data users in setting work priorities and providing data products.

## Confidentiality

All information requests made to the Montana Natural Heritage Program are considered library records and are protected from disclosure by the Montana Library Records Confidentiality Act (MCA 22-1-11).

## Information Managed

Information managed at the Montana Natural Heritage Program includes: (1) lists of, and basic information on, plant and animal species and biological communities; (2) plant and animal surveys, observations, species occurrences, predictive distribution models, range polygons, and conservation status ranks; and (3) land cover and wetland and riparian mapping and the conservation status of these and other biological communities.

# Data Use Terms and Conditions

- Montana Natural Heritage Program (MTNHP) products and services are based on biological data and the objective interpretation of those data by professional scientists. MTNHP does not advocate any particular philosophy of natural resource protection, management, development, or public policy.
- MTNHP has no natural resource management or regulatory authority. Products, statements, and services from MTNHP are intended to inform parties as to the state of scientific knowledge about certain natural resources, and to further develop that knowledge. The information is not intended as natural resource management guidelines or prescriptions or a determination of environmental impacts. MTNHP recommends consultation with appropriate state, federal, and tribal resource management agencies and authorities in the area where your project is located.
- Information on the status and spatial distribution of biological resources produced by MTNHP are intended to inform parties of the state-wide status, known occurrence, or the likelihood of the presence of those resources. **These products are not intended to substitute for field-collected data, nor are they intended to be the sole basis for natural resource management decisions.**
- MTNHP does not portray its data as exhaustive or comprehensive inventories of rare species or biological communities. **Field verification of the absence or presence of sensitive species and biological communities will always be an important obligation of users of our data.**
- MTNHP responds equally to all requests for products and services, regardless of the purpose or identity of the requester.
- Because MTNHP constantly updates and revises its databases with new data and information, products will become outdated over time. Interested parties are encouraged to obtain the most current information possible from MTNHP, rather than using older products. We add, review, update, and delete records on a daily basis. Consequently, we strongly advise that you update your MTNHP data sets at a minimum of every three months for most applications of our information.
- MTNHP data require a certain degree of biological expertise for proper analysis, interpretation, and application. Our staff is available to advise you on questions regarding the interpretation or appropriate use of the data that we provide. Contact information for MTNHP staff is posted at: http://mtnhp.org/contact.asp
- The information provided to you by MTNHP may include sensitive data that if publicly released might jeopardize the welfare of threatened, endangered, or sensitive species or biological communities. This information is intended for distribution or use only within your department, agency, or business. Subcontractors may have access to the data during the course of any given project, but should not be given a copy for their use on subsequent, unrelated work.
- MTNHP data are made freely available. Duplication of hard-copy or digital MTNHP products with the intent to sell is prohibited without written consent by MTNHP. Should you be asked by individuals outside your organization for the type of data that we provide, please refer them to MTNHP.
- MTNHP and appropriate staff members should be appropriately acknowledged as an information source in any third-party product involving MTNHP data, reports, papers, publications, or in maps that incorporate MTNHP graphic elements.
- Sources of our data include museum specimens, published and unpublished scientific literature, field surveys by state and federal agencies and private contractors, and reports from knowledgeable individuals. MTNHP actively solicits and encourages additions, corrections and updates, new observations or collections, and comments on any of the data we provide.
- MTNHP staff and contractors do not cross or survey privately-owned lands without express permission from the landowner. However, the program cannot guarantee that information provided to us by others was obtained under adherence to this policy.

# Suggested Contacts for Natural Resource Agencies

As required by Montana statute (MCA 90-15), the Montana Natural Heritage Program works with state, federal, tribal, nongovernmental organizations, and private partners to ensure that the latest animal and plant distribution and status information is incorporated into our databases so that it can be used to inform a variety of planning processes and management decisions. In addition to the information you receive from us, we encourage you to contact state, federal, and tribal resource management agencies in the area where your project is located. They may have additional data or management guidelines relevant to your efforts. In particular, we encourage you to contact the Montana Department of Fish, Wildlife, and Parks for the latest data and management information regarding hunted and high-profile management species and to use the U.S. Fish and Wildlife Service's Information Planning and Conservation (IPAC) website http://ecos.fws.gov/ipac/ regarding U.S. Endangered Species Act listed Threatened, Endangered, or Candidate species.

For your convenience, we have compiled a list of relevant agency contacts and links below:

**Montana Fish, Wildlife, and Parks**

| | |
|---|---|
| Fish Species | Zachary Shattuck zshattuck@mt.gov (406) 444-1231<br>or<br>Eric Roberts eroberts@mt.gov (406) 444-5334 |
| American Bison<br>Black-footed Ferret<br>Black-tailed Prairie Dog<br>Bald Eagle<br>Golden Eagle<br>Common Loon<br>Least Tern<br>Piping Plover<br>Whooping Crane | Lauri Hanauska-Brown LHanauska-Brown@mt.gov (406) 444-5209 |
| Grizzly Bear<br>Greater Sage Grouse<br>Trumpeter Swan<br>Big Game<br>Upland Game Birds<br>Furbearers | John Vore jvore@mt.gov (406) 444-3940 |
| Managed Terrestrial Game and Nongame Animal Data | Smith Wells – MFWP Data Analyst smith.wells@mt.gov (406) 444-3759 |
| Fisheries Data | Ryan Alger – MFWP Data Analyst ryan.alger@mt.gov (406) 444-5365 |
| Wildlife and Fisheries Scientific Collector's Permits | http://fwp.mt.gov/doingBusiness/licenses/scientificWildlife/<br>Kammi McClain for Wildlife Kammi.McClain@mt.gov (406) 444-2612<br>Kim Wedde for Fisheries kim.wedde@mt.gov (406) 444-5594 |
| Fish and Wildlife Recommendations for Subdivision Development | Renee Lemon RLemon@mt.gov (406) 444-3738<br>and see<br>http://fwp.mt.gov/fishAndWildlife/livingWithWildlife/buildingWithWildlife/subdivisionRecommendations/ |
| Regional Contacts<br>  <br> | Region 1 (Kalispell) (406) 752-5501<br>Region 2 (Missoula) (406) 542-5500<br>Region 3 (Bozeman) (406) 994-4042<br>Region 4 (Great Falls) (406) 454-5840<br>Region 5 (Billings) (406) 247-2940<br>Region 6 (Glasgow) (406) 228-3700<br>Region 7 (Miles City) (406) 234-0900 |

**United States Fish and Wildlife Service:**
Information Planning and Conservation (IPAC) website: http://ecos.fws.gov/ipac/
Montana Ecological Services Field Office: http://www.fws.gov/montanafieldoffice/ (406) 449-5225

**Bureau of Land Management**

Montana Field Office Contacts:


| | |
|---|---|
| Billings | (406) 896-5013 |
| Butte | (406) 533-7600 |
| Dillon | (406) 683-8000 |
| Glasgow | (406) 228-3750 |
| Havre | (406) 262-2820 |
| Lewistown | (406) 538-1900 |
| Malta | (406) 654-5100 |
| Miles City | (406) 233-2800 |
| Missoula | (406) 329-3914 |

**United States Forest Service**

**Regional Office – Missoula, Montana Contacts**

| | | | |
|---|---|---|---|
| Wildlife Program Leader | Tammy Fletcher | tammyfletcher@fs.fed.us | (406) 329-3588 |
| Wildlife Ecologist | Cara Staab | cstaab@fs.fed.us | (406) 329-3677 |
| Fish Program Leader | Scott Spaulding | scottspaulding@fs.fed.us | (406) 329-3287 |
| Fish Ecologist | Cameron Thomas | cathomas@fs.fed.us | (406) 329-3087 |
| TES Program | Lydia Allen | lrallen@fs.fed.us | (406) 329-3558 |
| Interagency Grizzly Bear Coordinator | Scott Jackson | sjackson03@fs.fed.us | (406) 329-3664 |
| Regional Botanist | Steve Shelly | sshelly@fs.fed.us | (406) 329-3041 |
| Invasive Species Program Manager | Michelle Cox | michelle.cox2@usda.gov | (406) 329-3669 |

**Tribal Nations**


Assiniboine & Gros Ventre Tribes – Fort Belknap Reservation
Assiniboine & Sioux Tribes – Fort Peck Reservation
Blackfeet Tribe - Blackfeet Reservation
Chippewa Creek Tribe - Rocky Boy's Reservation
Crow Tribe – Crow Reservation
Little Shell Chippewa Tribe
Northern Cheyenne Tribe – Northern Cheyenne Reservation
Salish & Kootenai Tribes - Flathead Reservation

**Natural Heritage Programs and Conservation Data Centers in Surrounding States and Provinces**
Alberta Conservation Information Management System
British Columbia Conservation Data Centre
Idaho Natural Heritage Program
North Dakota Natural Heritage Program
Saskatchewan Conservation Data Centre
South Dakota Natural Heritage Program
Wyoming Natural Diversity Database

## Invasive Species Management Contacts and Information

### Aquatic Invasive Species

Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff
Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program
Montana Invasive Species Council (MISC)
Upper Columbia Conservation Commission (UC3)

### Noxious Weeds

Montana Weed Control Association Contacts Webpage
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Integrated Noxious Weed Management after Wildfires

# Introduction to Native Species

Within the report area you have requested, separate summaries are provided for: (1) Species Occurrences (SO) for plant and animal Species of Concern, Special Status Species (SSS), Important Animal Habitat (IAH) and some Potential Plant Species of Concern; (2) other observed non Species of Concern or Species of Concern without suitable documentation to create Species Occurrence polygons; and (3) other non-documented species that are potentially present based on their range, predicted suitable habitat model output, or presence of associated habitats. Each of these summaries provides the following information when present for a species: (1) the number of Species Occurrences and associated delineation criteria for construction of these polygons that have long been used for considerations of documented Species of Concern in environmental reviews; (2) the number of observations of each species; (3) the geographic range polygons for each species that the report area overlaps; (4) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (5) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the Montana Field Guide; and (6) a variety of conservation status ranks and links to species accounts in the Montana Field Guide. Details on each of these information categories are included under relevant section headers below or are defined on our Species Status Codes page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document native and introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are restricted by declining budgets, and information is constantly being added and updated in our databases. **Thus, field verification by professional biologists of the absence or presence of species and biological communities will always be an important obligation of users of our data.**

If you are aware of observation datasets that the MTNHP is missing, please report them to the Program Botanist apipp@mt.gov or Senior Zoologist dbachen@mt.gov. If you have observations that you would like to contribute, you can submit animal observations using our online data entry system at http://mtnhp.org/AddObs/, plant and animal observations via Excel spreadsheets posted at http://mtnhp.org/observations.asp , or to the Program Botanist or Senior Zoologist.

**Observations**

The MTNHP manages information on more than 1.8 million animal and plant observations that have been reported by professional biologists and private citizens from across Montana. The majority of these observations are submitted in digital format from standardized databases associated with research or monitoring efforts and spreadsheets of incidental observations submitted by professional biologists and amateur naturalists. At a minimum, accepted observation records must contain a credible species identification (i.e. appropriate geographic range, date, and habitat and, if species are difficult to identify, a photograph and notes on key identifying features), a date or date range, observer name, locational information (ideally with latitude and longitude in decimal degrees), notes on numbers observed, and species behavior or habitat use (e.g., is the observation likely associated with reproduction). Bird records are also required to have information associated with date-appropriate breeding or overwintering status of the species observed. MTNHP reviews observation records to ensure that they are mapped correctly, occur within date ranges when the species is known to be present or detectable, occur within the known seasonal geographic range of the species, and occur in appropriate habitats. MTNHP also assigns each record a locational uncertainty value in meters to indicate the spatial precision associated with the record's mapped coordinates. Only records with locational uncertainty values of 10,000 meters or less are included in environmental summary reports and number summaries are only provided for records with locational uncertainty values of 1,000 meters or less.

## Species Occurrences

The MTNHP evaluates plant and animal observation records for species of higher conservation concern to determine whether they are worthy of inclusion in the Species Occurrence (SO) layer for use in environmental reviews; observations not worthy of inclusion in this layer include long distance dispersal events, migrants observed away from key migratory stopover habitats, and winter observations. An SO is a polygon depicting what is known about a species occupancy from direct observation with a defined level of locational uncertainty and any inference that can be made about adjacent habitat use from the latest peer-reviewed science. If an observation can be associated with a map feature that can be tracked (e.g., a wetland boundary for a wetland associated plant) then this polygon feature is used to represent the SO. Areas that can be inferred as probable occupied habitat based on direct observation of a species location and what is known about the foraging area or home range size of the species may be incorporated into the SO. Species Occurrences generally belong to one of the following categories:

### Plant Species Occurrences

A documented location of a specimen collection or observed plant population. In some instances, adjacent, spatially separated clusters are considered subpopulations and are grouped as one occurrence (e.g., the subpopulations occur in ecologically similar habitats, and their spatial proximity likely allows them to interbreed). Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Plant SO's are only created for Species of Concern and Potential Species of Concern.

### Animal Species Occurrences

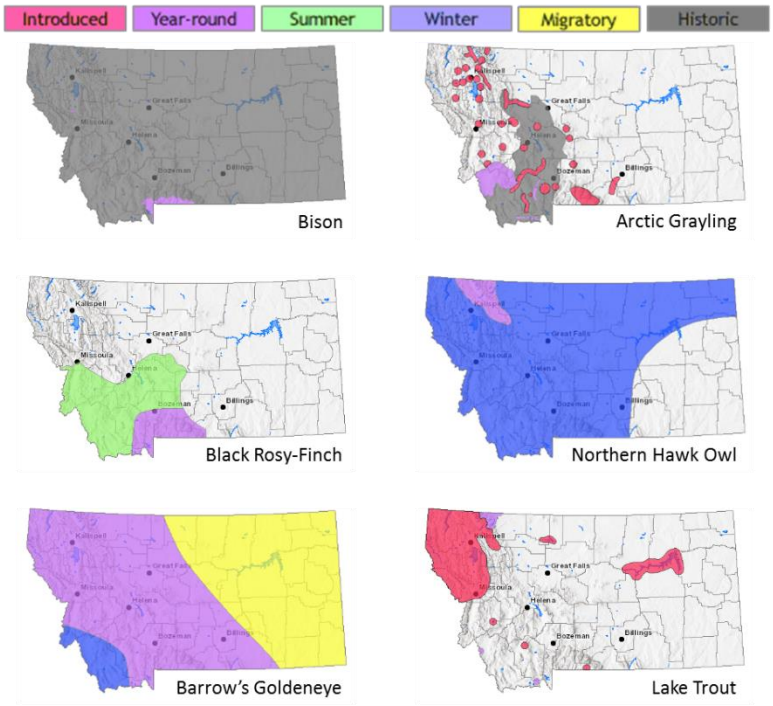
The location of a verified observation or specimen record typically known or assumed to represent a breeding population or a portion of a breeding population. Animal SO's are generally: (1) buffers of terrestrial point observations based on documented species' home range sizes; (2) buffers of stream segments to encompass occupied streams and immediate adjacent riparian habitats; (3) polygonal features encompassing known or likely breeding populations (e.g., a wetland for some amphibians or a forested portion of a mountain range for some wide ranging carnivores); or (4) combinations of the above. Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Species Occurrence polygons may encompass some unsuitable habitat in some instances in order to avoid heavy data processing associated with clipping out habitats that are readily assessed as unsuitable by the data user (e.g., a point buffer of a terrestrial species may overlap into a portion of a lake that is obviously inappropriate habitat for the species). Animal SO's are only created for Species of Concern and Special Status Species (e.g., Bald Eagle).

### Other Occurrence Polygons

These include significant biological features not included in the above categories, such as Important Animal Habitats like bird rookeries and bat roosts, and peatlands or other wetland and riparian communities that support diverse plant and animal communities.

## Geographic Range Polygons

Geographic range polygons have not yet been defined for most plant species. Native year-round, summer, winter, migratory and historic geographic range polygons as well as polygons for introduced populations have been defined for most animal species for which there are enough observations, surveys, and knowledge of appropriate seasonal habitat use to define them (see examples to left). These native or introduced range polygons bound the extent of known or likely occupied habitats for non-migratory and relative sedentary species and the regular extent of known or likely occupied habitats for migratory and long-distance dispersing species; polygons may include unsuitable intervening habitats. For most species, a single polygon can represent the year-round or seasonal range, but breeding ranges of some colonial nesting water birds and some introduced species are represented more patchily when supported by data. Some ranges are mapped more broadly than actual distributions in order to be visible on statewide maps (e.g., fish).




## Predicted Suitable Habitat Models

Recent predicted suitable habitat suitability models have not yet been created for most plant species. For animal species for which models have been completed, the environmental summary report includes simple, rule-based, associations with streams for fish and other aquatic species and mathematically complex Maximum Entropy models (Phillips et al. 2006, Ecological Modeling 190:231-259) constructed from a variety of statewide biotic and abiotic layers and presence only data for individual species contributed to Montana Natural Heritage Program databases for most terrestrial species. For the Maximum Entropy models, we reclassified 90 x 90-meter continuous model output into suitability classes (unsuitable, low, moderate, and optimal) then aggregated that into the one square mile hexagons used in the environmental summary report; this is the finest spatial scale we suggest using this information in management decisions and survey planning. Full model write ups for individual species that discuss model goals, inputs, outputs, and evaluation in much greater detail are posted on the MTNHP's Predicted Suitable Habitat Models page. Evaluations of predictive accuracy and specific limitations are included with the metadata for models of individual species. **Model outputs should not be used in place of on-the-ground surveys for species. Instead model outputs should be used in conjunction with habitat evaluations to determine the need for on-the-ground surveys for species.** We suggest that the percentage of predicted optimal and moderate suitable habitat within the report area be used in conjunction with geographic range polygons and the percentage of commonly associated habitats to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning.

## Associated Habitats

Within the boundary of the intersected hexagons, we provide the approximate percentage of commonly or occasionally associated habitat for vertebrate animal species that regularly breed, overwinter, or migrate through the state; a detailed list of commonly and occasionally associated habitats is provided in individual species accounts in the Montana Field Guide. We assigned common or occasional use of each of the 82 ecological systems mapped in Montana by: (1) using personal knowledge and reviewing literature that

summarizes the breeding, overwintering, or migratory habitat requirements of each species; (2) evaluating structural characteristics and distribution of each ecological system relative to the species' range and habitat requirements; (3) examining the observation records for each species in the state-wide point observation database associated with each ecological system; and (4) calculating the percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system to get a measure of numbers of observations versus availability of habitat. Species that breed in Montana were only evaluated for breeding habitat use, species that only overwinter in Montana were only evaluated for overwintering habitat use, and species that only migrate through Montana were only evaluated for migratory habitat use. In general, species were listed as associated with an ecological system if structural characteristics of used habitat documented in the literature were present in the ecological system or large numbers of point observations were associated with the ecological system. However, species were not listed as associated with an ecological system if there was no support in the literature for use of structural characteristics in an ecological system, even if point observations were associated with that system. Common versus occasional association with an ecological system was assigned based on the degree to which the structural characteristics of an ecological system matched the preferred structural habitat characteristics for each species as represented in the scientific literature. The percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system was also used to guide assignment of common versus occasional association.

We suggest that the percentage of commonly associated habitat within the report area be used in conjunction with geographic range polygons and the percentage of predicted optimal and moderate suitable habitat from predictive models to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning. Users of this information should be aware that land cover mapping accuracy is particularly problematic when the systems occur as small patches or where the land cover types have been altered over the past decade. Thus, particular caution should be used when using the associations in assessments of smaller areas (e.g., evaluations of public land survey sections).

# Introduction to Land Cover

Land Use/Land Cover is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The layer records all Montana natural vegetation, land cover and land use, classified from satellite and aerial imagery, mapped at a scale of 1:100000, and interpreted with supporting ground-level data. The baseline map is adapted from the Northwest ReGAP (NWGAP) project land cover classification, which used 30m resolution multi-spectral Landsat imagery acquired between 1999 and 2001. Vegetation classes were drawn from the Ecological System Classification developed by NatureServe (Comer et al. 2003). The land cover classes were developed by Anderson et al. (1976). The NWGAP effort encompasses 12 map zones. Montana overlaps seven of these zones. The two NWGAP teams responsible for the initial land cover mapping effort in Montana were Sanborn and NWGAP at the University of Idaho. Both Sanborn and NWGAP employed a similar modeling approach in which Classification and Regression Tree (CART) models were applied to Landsat ETM+ scenes. The Spatial Analysis Lab within the Montana Natural Heritage Program was responsible for developing a seamless Montana land cover map with a consistent statewide legend from these two separate products. Additionally, the Montana land cover layer incorporates several other land cover and land use products (e.g., MSDI Structures and Transportation themes and the Montana Department of Revenue Final Land Unit classification) and reclassifications based on plot-level data and the latest NAIP imagery to improve accuracy and enhance the usability of the theme. Updates are done as partner support and funding allow, or when other MSDI datasets can be incorporated. Recent updates include fire perimeters and agricultural land use (annually), energy developments such as wind, oil and gas installations (2014), roads, structures and other impervious surfaces (various years): and local updates/improvements to specific ecological systems (e.g., central Montana grassland and sagebrush ecosystems). Current and previous versions of the Land Use/Land Cover layer with full metadata are available for download at the Montana State Library's Geographic Information Clearinghouse.

Within the report area you have requested, land cover is summarized by acres of Level 1, Level 2, and Level 3 Ecological Systems.

Literature Cited

Anderson, J.R. E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. U.S. Geological Survey Professional Paper 964.

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.

# Introduction to Wetland and Riparian

Within the report area you have requested, wetland and riparian mapping is summarized by acres of each classification present. Summaries are only provided for modern MTNHP wetland and riparian mapping and not for outdated (NWI Legacy) or incomplete (NWI Scalable) mapping efforts; described here. MTNHP has made all three of these datasets and associated metadata available for separate download on the Montana Wetland and Riparian Framework MSDI download page.

Wetland and Riparian mapping is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The wetland and riparian framework layer consists of spatial data representing the extent, type, and approximate location of wetlands, riparian areas, and deepwater habitats in Montana.

Wetland and riparian mapping is completed through photointerpretation of 1-m resolution color infrared aerial imagery acquired from 2005 or later. A coding convention using letters and numbers is assigned to each mapped wetland. These letters and numbers describe the broad landscape context of the wetland, its vegetation type, its water regime, and the kind of alterations that may have occurred. Ancillary data layers such as topographic maps, digital elevation models, soils data, and other aerial imagery sources are also used to improve mapping accuracy. Wetland mapping follows the federal Wetland Mapping Standard and classifies wetlands according to the Cowardin classification system of the National Wetlands Inventory (NWI) (Cowardin et al. 1979, FGDC Wetlands Subcommittee 2013). Federal, State, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands differently than the NWI. Similar coding, based on U.S. Fish and Wildlife Service conventions, is applied to riparian areas (U.S. Fish and Wildlife Service 2009). These are mapped areas where vegetation composition and growth is influenced by nearby water bodies, but where soils, plant communities, and hydrology do not display true wetland characteristics. **These data are intended for use in publications at a scale of 1:12,000 or smaller. Mapped wetland and riparian areas do not represent precise boundaries and digital wetland data cannot substitute for an on-site determination of jurisdictional wetlands.**

A detailed overview, with examples, of both wetland and riparian classification systems and associated codes can be found at: http://mtnhp.org/help/MapViewer/WetRip_Classification.asp

Literature Cited

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS-79/31. Washington, D.C. 103pp.

Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, D.C.

U.S. Fish and Wildlife Services. 2009. A system for mapping riparian areas in the western United States. Division of Habitat and Resource Conservation, Branch of Resource and Mapping Support, Arlington, Virginia.

# Introduction to Land Management

Within the report area you have requested, land management information is summarized by acres of federal, state, and local government lands, tribal reservation boundaries, private conservation lands, and federal, state, local, and private conservation easements. Acreage for "Owned", "Tribal", or "Easement" categories represents non-overlapping areas that may be totaled. However, "Other Boundaries" represents managed areas such as National Forest boundaries containing private inholdings and other mixed ownership which may cause boundaries to overlap (e.g. a wilderness area within a forest). Therefore, acreages may not total in a straight-forward manner.

Because information on land stewardship is critical to effective land management, the Montana Natural Heritage Program (MTNHP) began compiling ownership and management data in 1997. The goal of the Montana Land Management Database is to manage a single, statewide digital data set that incorporates information from both public and private entities. The database assembles information on public lands, private conservation lands, and conservation easements held by state and federal agencies and land trusts and is updated on a regular basis. Since 2011, the Information Management group in the Montana State Library's Digital Library Division has taken an increasingly active role in managing layers of the Montana Land Management Database in partnership with the MTNHP.

Public and private conservation land polygons are attributed with the name of the entity that owns it. The data are derived from the statewide Montana Cadastral Parcel layer. Conservation easement data shows land parcels on which a public agency or qualified land trust has placed a conservation easement in cooperation with the land owner. The dataset contains no information about ownership or status of the mineral estate. For questions about the dataset or to report errors, please contact the Montana Natural Heritage Program at (406) 444-5354 or mtnhp@mt.gov. You can download various components of the Land Management Database and view associated metadata at the Montana State Library's GIS Data List at the following links:

Public Lands
Conservation Easements
Private Conservation Lands
Managed Areas

**Map features in the Montana Land Management Database or summaries provided in this report are not intended as a legal depiction of public or private surface land ownership boundaries and should not be used in place of a survey conducted by a licensed land surveyor. Similarly, map features do not imply public access to any lands. The Montana Natural Heritage Program makes no representations or warranties whatsoever with respect to the accuracy or completeness of this data and assumes no responsibility for the suitability of the data for a particular purpose. The Montana Natural Heritage Program will not be liable for any damages incurred as a result of errors displayed here. Consumers of this information should review or consult the primary data and information sources to ascertain the viability of the information for their purposes.**

# Introduction to Invasive and Pest Species

Within the report area you have requested, separate summaries are provided for: Aquatic Invasive Species, Noxious Weeds, Agricultural Pests, and Forest Pests that have been documented or potentially occur there based on their known distribution in the state. Definitions for each of these invasive and pest species categories can be found on our Species Status Codes page.

Each of these summaries provides the following information when present for a species: (1) the number of observations of each species; (2) the geographic range polygons for each species, if developed, that the report area overlaps; (3) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (4) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the Montana Field Guide; and (5) and links to species accounts in the Montana Field Guide. Details on each of these information categories are included under relevant section headers under the Introduction to Native Species above or are defined on our Species Status Codes page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what invasive and pest species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are restricted by declining budgets, and information is constantly being added and updated in our databases. **Thus, field verification by professional biologists of the absence or presence of species will always be an important obligation of users of our data.**

If you are aware of observation or survey datasets for invasive or pest species that the MTNHP is missing, please report them to the Program Coordinator bmaxell@mt.gov Program Botanist apipp@mt.gov or Senior Zoologist dbachen@mt.gov. If you have observations that you would like to contribute, you can submit animal observations using our online data entry system at http://mtnhp.org/AddObs/, plant and animal observations via Excel spreadsheets posted at http://mtnhp.org/observations.asp , or to the Program Botanist or Senior Zoologist.

# Additional Information Resources

Home Page for Montana Natural Heritage Program (MTNHP)

MTNHP Staff Contact Information

Montana Field Guide

MTNHP Species of Concern Report - Animals and Plants

MTNHP Species Status Codes - Explanation

MTNHP Predicted Suitable Habitat Models (for select Animals and Plants)

MTNHP Request Information page

Montana Cadastral

Montana Code Annotated

Montana Department of Environmental Quality

Montana Fisheries Information System

Montana Fish, Wildlife, and Parks Subdivision Recommendations

Montana GIS Data Layers

Montana GIS Data Bundler

Montana Greater Sage-Grouse Project Submittal Site

Montana Ground Water Information Center

Montana Legislative Environmental Policy Office Publications
(Including Index of Environmental Permits required in Montana and Guide to the Montana Environmental Policy Act)

Montana Environmental Policy Act (MEPA)

MEPA Analysis Resource List

Laws, Treaties, Regulations, and Permits on Animals and Plants

Montana Spatial Data Infrastructure Layers

Montana State Historic Preservation Office Review and Compliance

Montana Water Information System

Montana Web Map Services

National Environmental Policy Act

U.S. Fish and Wildlife Service Information for Planning and Conservation (Section 7 Consultation)

Web Soil Survey Tool

US 191 Corridor Study

*Four Corners to Beaver Creek*

# Appendix E:

## *EJSCREEN Report*

# EJSCREEN Report (Version 2018)

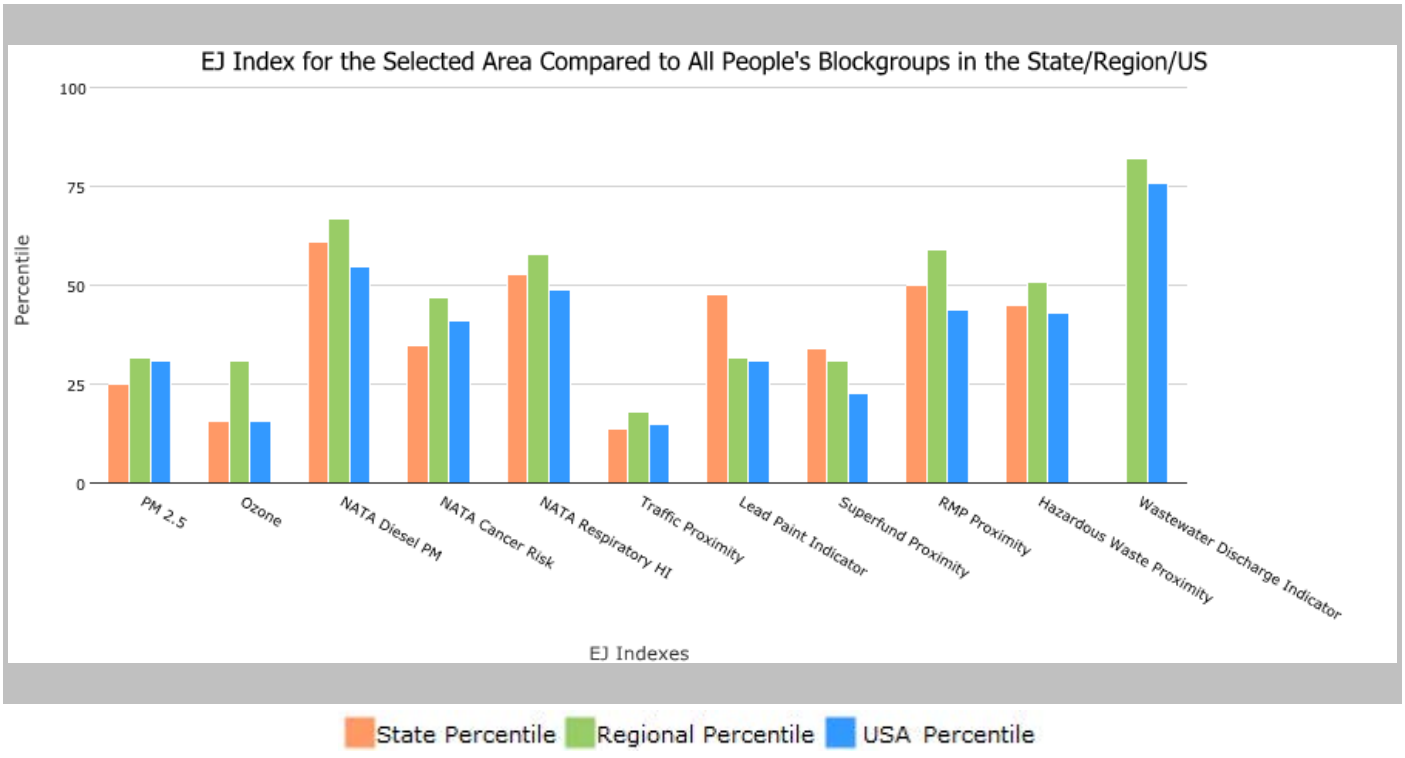
**.5 mile Ring around the Corridor, MONTANA, EPA Region 8**

**Approximate Population: 2,249**

**Input Area (sq. miles): 37.40**

**US 191 Study Area**

| Selected Variables | State Percentile | EPA Region Percentile | USA Percentile |
|---|---|---|---|
| **EJ Indexes** | | | |
| EJ Index for PM2.5 | 25 | 32 | 31 |
| EJ Index for Ozone | 16 | 31 | 16 |
| EJ Index for NATA* Diesel PM | 61 | 67 | 55 |
| EJ Index for NATA* Air Toxics Cancer Risk | 35 | 47 | 41 |
| EJ Index for NATA* Respiratory Hazard Index | 53 | 58 | 49 |
| EJ Index for Traffic Proximity and Volume | 14 | 18 | 15 |
| EJ Index for Lead Paint Indicator | 48 | 32 | 31 |
| EJ Index for Superfund Proximity | 34 | 31 | 23 |
| EJ Index for RMP Proximity | 50 | 59 | 44 |
| EJ Index for Hazardous Waste Proximity | 45 | 51 | 43 |
| EJ Index for Wastewater Discharge Indicator | N/A | 82 | 76 |




This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

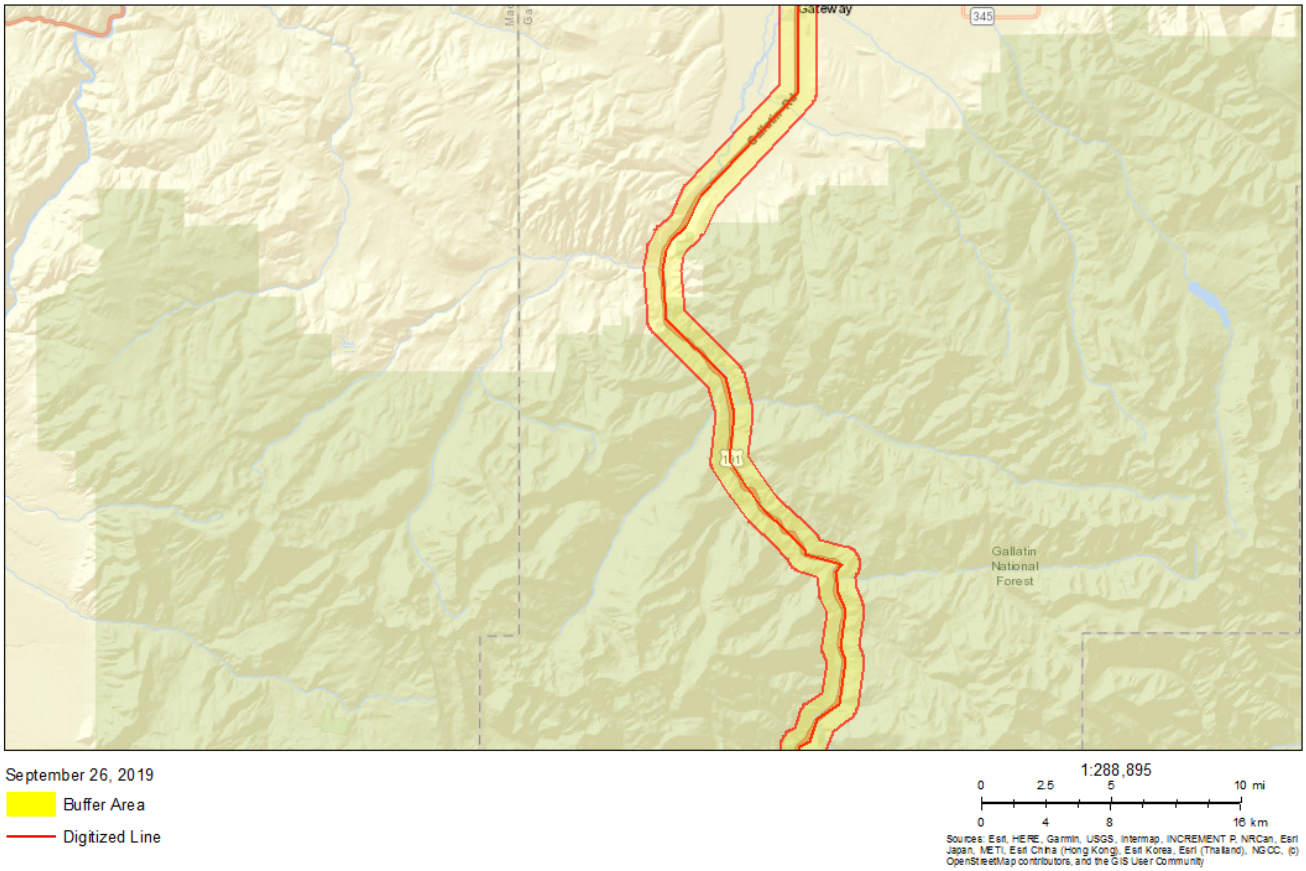
# EJSCREEN Report (Version 2018)

**.5 mile Ring around the Corridor, MONTANA, EPA Region 8**

**Approximate Population: 2,249**

**Input Area (sq. miles): 37.40**

**US 191 Study Area**




| Sites reporting to EPA | |
|---|---|
| Superfund NPL | 0 |
| Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF) | 0 |

# EJSCREEN Report (Version 2018)

**.5 mile Ring around the Corridor, MONTANA, EPA Region 8**

**Approximate Population: 2,249**

**Input Area (sq. miles): 37.40**

**US 191 Study Area**

| Selected Variables | Value | State Avg. | %ile in State | EPA Region Avg. | %ile in EPA Region | USA Avg. | %ile in USA |
|---|---|---|---|---|---|---|---|
| **Environmental Indicators** | | | | | | | |
| Particulate Matter (PM 2.5 in µg/m$^3$) | 5.57 | 6.5 | 20 | 6.64 | 25 | 9.53 | 1 |
| Ozone (ppb) | 43.4 | 40.1 | 98 | 48.6 | 22 | 42.5 | 59 |
| NATA* Diesel PM (µg/m$^3$) | 0.0277 | 0.244 | 7 | 0.607 | <50th | 0.938 | <50th |
| NATA* Cancer Risk (lifetime risk per million) | 14 | 22 | 4 | 30 | <50th | 40 | <50th |
| NATA* Respiratory Hazard Index | 0.28 | 0.84 | 3 | 1.4 | <50th | 1.8 | <50th |
| Traffic Proximity and Volume (daily traffic count/distance to road) | 110 | 150 | 65 | 250 | 57 | 600 | 52 |
| Lead Paint Indicator (% Pre-1960 Housing) | 0.17 | 0.29 | 43 | 0.22 | 61 | 0.29 | 47 |
| Superfund Proximity (site count/km distance) | 0.039 | 0.11 | 45 | 0.11 | 49 | 0.12 | 42 |
| RMP Proximity (facility count/km distance) | 0.044 | 0.47 | 27 | 0.61 | 12 | 0.72 | 8 |
| Hazardous Waste Proximity (facility count/km distance) | 0.044 | 0.44 | 39 | 0.63 | 23 | 4.3 | 11 |
| Wastewater Discharge Indicator (toxicity-weighted concentration/m distance) | 0 | 0.034 | N/A | 480 | 38 | 30 | 40 |
| **Demographic Indicators** | | | | | | | |
| Demographic Index | 16% | 24% | 29 | 27% | 32 | 36% | 21 |
| Minority Population | 3% | 13% | 17 | 24% | 7 | 38% | 8 |
| Low Income Population | 29% | 35% | 40 | 30% | 54 | 34% | 47 |
| Linguistically Isolated Population | 0% | 0% | 82 | 2% | 55 | 4% | 44 |
| Population With Less Than High School Education | 4% | 7% | 30 | 9% | 34 | 13% | 20 |
| Population Under 5 years of age | 8% | 6% | 75 | 7% | 66 | 6% | 74 |
| Population over 64 years of age | 11% | 17% | 26 | 13% | 48 | 14% | 38 |

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice