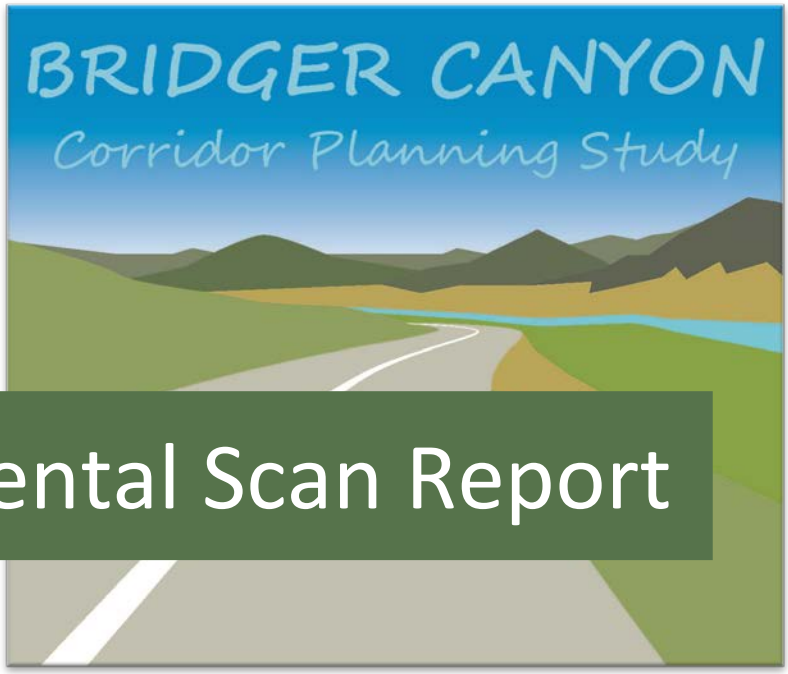

DRAFT Environmental Scan Report

September 22, 2014

Prepared for:

MONTANA MDT DEPARTMENT OF TRANSPORTATION

Prepared by:

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Abbreviations and Acronyms

ACS	American Community Survey
APE	Area of Potential Effect
CAPS	Crucial Areas Planning System
CEIC	Census and Economic Information Center
CFR	Code of Federal Regulations
CRABS	Cultural Resource Annotated Bibliography System
CRIS	Cultural Resource Information Systems
DEQ	Montana Department of Environmental Quality
DNRC	Montana Department of Natural Resources and Conservation
DOC	Montana Department of Commerce
DOLI	Montana Department of Labor and Industry
EO	Executive Order
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act
FWP	Montana Department of Fish, Wildlife, and Parks
HUC	Hydrologic Unit Code
LUST	Leaking Underground Storage Tank
LWCFA	Land and Water Conservation Fund Act
MBMG	Montana Bureau of Mines and Geology
MBTA	Migratory Bird Treaty Act
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MFISH	Montana Fisheries Information System
MNHP	Montana Natural Heritage Program
MSATs	Mobile Source Air Toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRIS	Natural Resource Information System
NWI	National Wetlands Inventory
PM	Particulate Matter
RP	Reference Post
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Office
SOC	Species of Concern
T&E	Threatened and Endangered
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USC	United States Code
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank

1.0 Introduction

The primary objective of this environmental scan report is to provide a planning-level overview of resources and determine potential constraints and opportunities for the Bridger Canyon Corridor Planning Study. Information in this report was obtained from publically-available reports, websites, and documentation. This scan is not a detailed environmental investigation.

If improvement options are forwarded from this study into project development, an analysis for compliance with the National and Montana Environmental Policy Acts (NEPA and MEPA) will be completed as part of the Montana Department of Transportation (MDT) project development process. Information provided in this report may be forwarded into the NEPA/MEPA process at that time.

1.1 Study Area

The Bridger Canyon corridor is located in south-central Montana in Gallatin and Park Counties. Land use within the corridor varies considerably, and includes dispersed residential development, undeveloped forest, recreational areas, and grass rangeland. The portion of MT 86 within the study area is classified as a rural minor arterial – non interstate, connecting Bozeman and the Gallatin Valley to the Bridger Bowl ski area, the Gallatin National Forest, and US 89 in the Shields River valley. A portion of this roadway is within the Gallatin National Forest and provides entrance to multiple United States Forest Service (USFS) access points throughout the corridor.

The study area for this environmental scan report includes the MT 86 corridor and a 300-foot buffer on both sides of the roadway (for a total buffer width of 600 feet) throughout the majority of the corridor. A buffer width ranging up to approximately 1,700 feet is included from approximate RP 4.0 to RP 5.0 to include a landslide and historic quarry at approximate RP 4.4. The study area begins at the MT 86 intersection with Story Mill Road at Reference Post (RP) 1.95 just east of Bozeman, MT, and ends at the intersection with US 89 at RP 37.5 near Wilsall, MT. Multiple maps have been prepared to illustrate resources present in the study area. Due to the length of the corridor, most exhibits are multiple pages in length. As a result, and for ease of reference, all exhibits are included in Attachment 1. The corridor location is illustrated in Exhibit 1, and a topographic map of the corridor is provided in Exhibit 2.

2.0 Physical Environment

2.1 Soil Resources and Prime Farmland

Soils information was reviewed to determine the presence of prime and unique farmland in the study area to demonstrate compliance with the Farmland Protection Policy Act (FPPA). The FPPA is intended "to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure that federal programs are administered in a matter that, to the extent practicable, will be compatible with State, unit of local government, and private programs and policies to protect farmland."

The term "farmland" refers to prime farmland; some prime if irrigated farmland; unique farmland; and farmland, other than prime or unique farmland, that is of statewide importance. 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, forage, and oilseed crops.

Soil surveys of the study area are available from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) (see Attachment 2). NRCS soil surveys indicate the majority of the corridor is either prime farmland, farmland of state or local importance, or prime farmland if irrigated. Specifically, areas classified as prime farmland, prime farmland if irrigated, and farmland of state or local importance are located between RP 1 to RP 15 and RP 22.5 to RP 31 (refer to Exhibit 3).

Any forwarded improvement options that require right-of-way within identified farmlands and are supported with federal funds will require a CPA-106 Farmland Conversion Impact Rating Form for Linear Projects completed by MDT and coordinated with NRCS. The NRCS uses information from the impact rating form to keep inventory of the prime and important farmlands within the state.

Exhibit 3 (in Attachment 1) contains maps and descriptions of the farmland classification types found in the study area.

2.2 Geologic Resources

Information on the geology and seismicity in the area of the corridor study was obtained from several published sources. Geologic mapping was reviewed for rock types, the presence of unconsolidated material, and fault lines. The seismicity and potential seismic hazards were also reviewed. This geologic information can help determine potential design and construction issues related to embankments and road design. The following is a brief summary of the geologic and seismic conditions present in the corridor study area. Exhibit 4 (in Attachment 1) presents the geologic formations and structures within the study area.

Montana is a seismically-active state. The Intermountain Seismic Belt is a regional zone of seismicity that extends through western Montana from the northwest corner (Flathead Lake region) to Yellowstone National Park (see Attachment 3). The Intermountain Seismic Belt roughly corresponds to the eastern margin of the Basin and Range Province (Smith and Sbar, 1974). The study area is located along the eastern edge of the Intermountain Seismic Belt. The most significant seismic events to occur near Bozeman were the 1925 Clarkston Valley earthquake (magnitude 6.75) and Hebgen Lake earthquake in 1959 (magnitude 7.5 and the largest earthquake to have occurred in Montana).

Numerous faults have been mapped within the study corridor. Most of these are old, inactive thrust faults. There are four main Quaternary (younger) faults surrounding the Bozeman area: the Central Park, Bridger, Gallatin Range, and the Elk Creek faults all with offset during the last 1.6 million years (Stickney and others, 2000). The Bridger fault is the only fault located within the study area, and although concealed by surficial deposits, it most likely crosses the study corridor between RP 2.5 and 3.0. The northern portion of the Emigrant fault is located to the east of the study area near Livingston and has had offset during the last 130,000 years (Stickney and others, 2000). No faults have been identified near or within the study area that have had offset in the past 15,000 years.

Seismic design of highway infrastructure is conducted in accordance with American Association of State Highway and Transportation Officials guidelines. Earthquakes can induce rock fall, slope movement (landslides), and liquefaction. When soils liquefy, they lose strength and temporarily behave like liquids. Seismically-induced liquefaction typically occurs in loose, saturated, sandy material commonly associated unconsolidated deposits or fill. The seismically-induced loss of strength can result in failure of the ground surface, most typically expressed as lateral spreads, surface cracks, settlement, or sand boils. Structures, including roadways, can sustain substantial damage during a large seismic event if they are supported in or on a soil susceptible to liquefaction.

Quaternary alluvium (Qal) is present along much of the corridor (Exhibit 4 in Attachment 1). Alluvium and other unconsolidated deposits in this area are typically described as a mixture of gravel, sand, silt, and clay. The presence of alluvium consisting predominantly of sand and potentially susceptible to liquefaction is possible, although unlikely. Bedrock along the study corridor consists of Cambrian- to Cretaceous-aged sedimentary rocks from RP 5 to RP 6. The bedrock along the remainder of the study corridor consists of Cretaceous-aged sedimentary rocks. Landslide deposits (Qls) are present in the area along the valley sides.

A slide area near RP 4.4 has been the subject of investigation by Montana State University geologists and state highway personnel since the late 1950s. The rock face south of the original MT 86 alignment was undermined at its base due to the roadway cut slope and quarry operations, which removed material used for construction of the interstate highway and other roadways in the area. According to a 1967 State Highway Commission memorandum (Attachment 4), a landslide developed in the upper reaches of the quarry shortly after completion of quarrying as a result of blasting and removal of material. At that time, the toe of the slide was several feet above the ditchline of the roadway. A January 1976 Department of Highways memorandum (Attachment 4) notes that "during the spring of 1975, heavy precipitation and surface run-off re-activated the subject slide resulting in the movement of a considerable quantity of rock on to the highway." In 1975, MT 86 traffic was redirected to the north via a detour route which is still in use today. Past studies have warned that the slide area is unstable and susceptible to continuous sloughing, and that an earthquake or heavy precipitation event could activate another slide event. A minor slide has also been reported on the north side of MT 86 east of the major slide at RP 4.4, although no documentation was identified for the minor slide. Additional slope stability evaluation may need to be conducted on slopes immediately adjacent to MT 86 for any improvements forwarded from this study.

MDT maintains the Montana Rockfall Hazard Rating System to better manage rock slope assets along Montana highways. A 2003-2005 MDT research program evaluated rockfall history and behavior throughout the state. "A"-rated sites indicate a high potential for rockfall hazard. Detailed ratings were completed at approximately 850 "A"-rated sites. The top 100 "A"-rated sites were further evaluated, and conceptual designs and construction cost-to-cure estimates were prepared. The Rockfall Hazard Classification and Mitigation System report (MDT, 2005) lists nine sites within the Bridger Canyon corridor, located from approximate RP 4.4 to 19.1. "A" ratings were assigned to two of the nine sites, one of which (located at approximate RP 4.4) was ranked 36 out of the top 100 sites. The other site is located at approximately RP 15.9-16.0. The estimated cost to cure this site in 2005 dollars was approximately $364,000 (see Attachment 5). Improvements adjacent to the nine sites may require an engineering analysis to determine if rockfall hazard mitigation is practicable.

Improvements forwarded from the study may require evaluations of soil and rock formations at the location work is anticipated to take place to ensure soil suitability.

2.3 Surface Waters

Topographic maps and geographic information system data were reviewed to identify the location of surface water bodies within the study area, including rivers, streams, lakes, and reservoirs. Named streams within the study area are listed below.

Brackett Creek	Fairy Creek	Olson Creek
Bridger Creek	Flathead Creek	North Fork Brackett Creek
Cache Creek	Lyman Creek	Place Creek
Carrol Creek	Maynard Creek	South Fork Brackett Creek
Dry Creek	Middle Fork Brackett Creek	Stone Creek
East Gallatin River	Muddy Creek	White Creek

A variety of additional surface waters, including unnamed streams, natural drainages, wetlands, and ponds are also present in the study area. Impacts to these surface waters may occur from improvements such as culverts under the roadway, placement of fill, or rip rap armoring of banks. Coordination with federal, state, and local agencies would be necessary to determine appropriate permits if improvement options are forwarded from this study, as any work within these waters may be regulated by the United States Army Corps of Engineers (USACE), the Montana Department of Fish, Wildlife and Parks (FWP), Montana Department of Natural Resources and Conservation (DNRC), and the Montana Department of Environmental Quality (DEQ). Impacts should be avoided and minimized to the maximum extent practicable. Stream and wetland impacts may trigger compensatory mitigation requirements of the USACE. In addition, forwarded improvement options may trigger the need to obtain coverage under the Montana Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity and comply with the requirements outlined in MDT's Storm Water Management Plan. Exhibit 5 (in Attachment 1) contains maps depicting surface waters found in the study area.

Total Maximum Daily Loads

The study area traverses the Gallatin River Watershed (hydrologic unit code (HUC) 10020008) and the Shields River Watershed (HUC 10070003). Information on the Gallatin and Shields Rivers and their tributaries within the study area was obtained from the DEQ website. Section 303 subsection "d" of the Clean Water Act requires the state of Montana to develop a list, subject to United States Environmental Protection Agency (USEPA) approval, of water bodies that do not meet water quality standards. When water quality fails to meet state water quality standards, DEQ determines the causes and sources of pollutants in a sub-basin assessment and sets maximum pollutant levels, called total maximum daily loads (TMDL).

TMDLs set by DEQ become the basis for implementation plans to restore water quality to a level that supports state designated beneficial water uses. The implementation plans identify and describe pollutant controls and management measures to be undertaken (such as best management practices), the mechanisms by which the selected measures would be put into action, and the individuals and entities responsible for implementation projects.

DEQ lists Bridger Creek, East Gallatin River, and Stone Creek as having an impairment in the Draft 2014 Integrated 303(d)/305(b) Water Quality Report for Montana (see Table 1). These three water bodies are listed as Category 4A, defined as waters where all TMDLs required to rectify all identified threats or impairments have been completed and approved. Should improvement options be advanced, it will be necessary to consider DEQ TMDL standards and potential impacts to water quality within receiving streams and watersheds in the study area.

Table 1 303(d) Listed Streams in Study Area

Named Stream	RP*	Category	Possible Impairment	Beneficial Uses
Brackett Creek	18.8	Not Listed in DEQ's Water Quality Database		
Bridger Creek	3.2	4A	Chlorophyll-a, Nitrate/Nitrite	Primary Contact Recreation, Primary Contact Recreation, Aquatic Life
Cache Creek	24.3	Not Listed in DEQ's Water Quality Database		
Carrol Creek	27.0	Not Listed in DEQ's Water Quality Database		
Dry Creek	32.5	Not Listed in DEQ's Water Quality Database		
East Gallatin River	0.8	4A	Nitrogen (Total), Phosphorus (Total)	Aquatic Life, Primary Contact Recreation
Fairy Creek	25.2	Not Listed in DEQ's Water Quality Database		
Flathead Creek	31.0	Not Listed in DEQ's Water Quality Database		
Lyman Creek	3.1	Not Listed in DEQ's Water Quality Database		
Maynard Creek	16.0	Not Listed in DEQ's Water Quality Database		
Middle Fork Brackett Creek	18.8	Not Listed in DEQ's Water Quality Database		
Muddy Creek	37.2	Not Listed in DEQ's Water Quality Database		
North Fork Brackett Creek	19.0	Not Listed in DEQ's Water Quality Database		
Olson Creek	14.1	Not Listed in DEQ's Water Quality Database		
Place Creek	5.9	Not Listed in DEQ's Water Quality Database		
South Fork Brackett Creek	18.8	Not Listed in DEQ's Water Quality Database		
South Fork Dry Creek	32.0	Not Listed in DEQ's Water Quality Database		
Stone Creek	11.4	4A	Alteration in stream-side or littoral vegetative covers, Physical substrate habitat alterations	Beneficial Use
White Creek	20.0	Not Listed in DEQ's Water Quality Database		

Source: DEQ, 2014. *RP locations approximated.

Wild and Scenic Rivers

The Wild and Scenic Rivers Act, created by Congress in 1968, provided for the protection of certain rivers, and their immediate environments, that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, or cultural resources, or other similar values. Based on a review of the United States National Park Service website, none of the waterways within the study area carry the wild and scenic designation.

2.4 Groundwater

According to the Montana Bureau of Mines and Geology (MBMG) Groundwater Information Center (GWIC), there are 16,506 wells on record in Gallatin County, and 5,545 wells on record in Park County. Some of these wells are located within the study area. The newest well on record

is from June 23, 2014, and the oldest well on record is from January 1860. The majority of wells within Gallatin County (approximately 10,075) are at a depth of 0 to 99 feet. In Park County, approximately half of the wells (2770) are at a depth of 0 to 99 feet. There are 76 statewide monitoring network wells in Gallatin County, and 19 in Park County. The wells in Gallatin and Park Counties have widely varying uses, with domestic wells being the most common. Groundwater data, such as well and geologic source information for Gallatin County and Park County, is presented in Exhibit 6 (in Attachment 1) and Attachment 6.

Impacts to existing wells will need to be considered if improvement options are forwarded from the study.

2.5 Wetlands

The USACE defines wetlands as those areas 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. Wetlands generally include swamps, marshes, bogs, and similar areas.

United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping data is available for this area from the NWI website or the Montana Natural Resource Information System (NRIS) (see Exhibit 5 in Attachment 1). While some useful information can be ascertained from the NWI maps, these maps are based on the USFWS definition of wetlands, which does not follow the USACE definition that MDT uses in wetland determination and delineation. NWI maps are typically generated based on aerial and satellite imagery, and are not accurate enough or detailed enough for MDT project wetland determination and/or delineation.

During the June 25, 2014, field review, wetlands were observed throughout the study area. Wetlands typically border streams that traverse or parallel the MT 86 corridor. Several large emergent and scrub/shrub wetland complexes border the riparian areas of Bridger Creek (RP 5.7 to RP 6.7), Carrol Creek (RP 26.8 to 27.4), South Fork Dry Creek (RP 29.2 to RP 29.7), Flathead Creek (RP 30.0 to RP 30.3), and Dry Creek (RP 32.6). Some of these wetland systems were well developed and provide ample wetland functions and values.

Generally, large emergent and scrub/shrub wetland systems border streams in the Flathead Creek drainage from RP 23 to RP 37.5 and forested, scrub/shrub wetlands border stream systems in the mountainous areas through Bridger Canyon along Bridger Creek and Brackett Creek. Additionally, emergent wetlands were observed in agricultural areas (RP 5 to RP 10) along Bridger Creek adjacent to irrigated hay fields.

Future wetland delineations would be required if improvement options are forwarded from the study that could potentially impact wetlands. Future projects in the corridor would need to incorporate project design features to avoid and minimize adverse impacts to wetlands to the maximum extent practicable. Unavoidable impacts to wetlands must be compensated through mitigation in accordance with the USACE regulatory requirements and requirements of Executive Order 11990. Work within jurisdictional wetlands would require a Clean Water Act 404 permit from the USACE.

2.6 Floodplains and Floodways

Executive Order (EO) 11988, Floodplain Management, requires 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. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities" for the following actions:

- acquiring, managing, and disposing of federal lands and facilities;
- providing federally-undertaken, financed, or assisted construction and improvements; and
- conducting federal activities and programs affecting land use, including but not limited to, water and related land resources planning, regulation, and licensing activities.

Federal-aid Policy Guide, 23 CFR 650, Bridges, Structures, and Hydraulics, provides “policies and procedures for the location and hydraulic design of highway encroachments on flood plains, including direct Federal highway projects administered by the [Federal Highway Administration (FHWA)].” This document defines “base flood” as the “flood or tide having a 1-percent chance of being exceeded in any given year” and “base flood plain” as the “area subject to flooding by the base flood.”

Federal Emergency Management Agency-issued flood maps for Gallatin and Park Counties indicate that five floodplain zones exist within the study area at the following locations (see Exhibit 7 in Attachment 1):

Zone A: Special Flood Hazard Area (SFHA) - 100-Year Flood, No Base Flood Elevations Determined (RP 4.2 – RP 7.4 and RP-31.0 to 37.2);
Zone AE: SFHA - 100-Year Flood, Base Flood Elevations Determined (RP 3.2);
Zone AE: SFHA – 100-Year Flood, Stream Channel Plus Adjacent Floodplains (RP 3.2, RP 4.3);
Zone D: Flood Hazards Undetermined, but possible (RP 8.9 – RP 31.0), and;
Zone X: Areas Outside the 500-Year Flood (RP 1.95 – RP 7.9 and RP 31.0 to 37.5).

If improvement options are forwarded from this study that result in the placement of fill within the regulatory floodplain, impacts to floodplains would need to be identified and evaluated. Project development could require coordination with Gallatin and Park Counties to minimize floodplain impacts and obtain necessary floodplain permits for project construction.

2.7 Irrigation

Irrigated grazing land exists in Gallatin and Park Counties adjacent to the study area. Depending on the improvement option(s) proposed during the corridor study, there is potential to impact irrigation facilities. Impacts to irrigation facilities should be avoided to the greatest extent practicable. Any future modifications to existing irrigation canals, ditches, or pressurized systems would be redesigned and constructed in consultation with the owners to minimize impacts to agricultural operations. Historic irrigation maps of Gallatin and Park Counties are provided in Attachment 7.

2.8 Air Quality

The USEPA has established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants, including carbon monoxide, nitrogen dioxide, ozone, particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide, and lead. The USEPA designates communities that do not meet NAAQS as "non-attainment areas." States are required to develop a plan to control source emissions and ensure future attainment of NAAQS. The study area is not located in a non-attainment area for any of the criteria pollutants. Additionally, there are no nearby non-attainment areas. As a result, special design considerations will not be required in future project design to accommodate NAAQS non-attainment issues.

Depending on the scope of improvements being considered along this corridor, an evaluation of mobile source air toxics (MSATs) may be required. MSATs are compounds emitted from highway vehicles and off-road equipment which are known or suspected to cause cancer or other serious health and environmental effects.

2.9 Hazardous Substances

The NRIS database provides information on underground storage tank (UST) sites, leaking underground storage tank (LUST) sites, abandoned mine sites, remediation response sites, landfills, National Priority List sites, hazardous waste, crude oil pipelines, and toxic release inventory sites. Four LUSTs, one abandoned mine (quarry) site, and one hazardous waste handler were identified within the study area (see Exhibit 8 in Attachment 1). The following is a brief summary of the primary sites within the study area and potential contamination impacts, which should be avoided if possible.

Underground Storage Tanks

Four USTs were identified within the corridor, all of which are classified as LUSTs and further discussed in the LUST section below. Additional investigation regarding the precise locations of the USTs may be warranted if improvement options are forwarded from this study (see Exhibit 8 in Attachment 1).

Leaking Underground Storage Tanks

Four LUSTs were identified within the study area (see Table 2). If LUSTs or contaminated soils are encountered, removal and cleanup will likely be required.

Table 2 LUST Sites within Study Area

Facility ID#	Facility Name	Address	Town	Status	Confirmed Date	Resolved Date
1604908	USFWS Fish Technology Center #889	4050 Bridger Canyon Road	Bozeman	Release Resolved	9/9/1981	7/8/1992
1611161	Jesse Lair #2674	7300 Bridger Canyon Road	Bozeman	Release Resolved	8/25/1995	7/31/1996
1601758	Paul Visscher #430	7850 Bridger Canyon Road	Bozeman	Release Resolved	1/20/1989	5/2/1989
1611170	Silver Forest Inn #378	15325 Bridger Canyon Road	Bozeman	Release Resolved	8/4/1999	11/15/1999

Source: NRIS, 2014.

Abandoned and Inactive Mine Sites

A single abandoned and inactive quarry site is located at approximate RP 4.4 (see Exhibit 8 in Attachment 1). A landslide associated with this quarry has covered approximately half of the former MT 86 alignment, which is currently bordered with concrete barriers. If improvements are proposed in this area, the site has the potential to affect project design and construction, and additional investigation may be necessary.

Hazardous Waste Handler

One hazardous waste handler was identified within the study area. According to the location indicated in the NRIS database, the site is likely the USFWS Bozeman Fish Technology Center at RP 4.0 (see Exhibit 8 in Attachment 1). If improvements to MT 86 are proposed in this area, additional coordination may be required.

3.0 Biological Resources

3.1 Vegetation

A combination of conifer-dominated forests, cultivated crops, sagebrush steppe, and Rocky Mountain grasslands habitat dominate the land cover in the vicinity of the study area (see in Exhibit 9 in Attachment 1 and Attachment 8). Riparian woodland and shrub-dominated rangeland line the riparian corridors of the numerous creeks and drainages that transect the study area. North and east of RP 23, the study area is buffered by rangeland, grassland, and riparian wetlands bordering the low-gradient streams in the area. Table 3 and Table 4 present land cover within Gallatin and Park Counties.

Table 3 Gallatin County Land Cover

% of Cover	Land Cover Type
13%	Rocky Mountain Montane Douglas-fir Forest and Woodland
11%	Cultivated Crops
11%	Montane Sagebrush Steppe
10%	Rocky Mountain Lower Montane, Foothill, and Valley Grassland
9%	Rocky Mountain Lodgepole Pine Forest
9%	Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
6%	Rocky Mountain Subalpine-Montane Mesic Meadow
3%	Aspen Forest and Woodland
3%	Big Sagebrush Steppe
3%	Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland
2%	Alpine-Montane Wet Meadow
2%	Other Roads

Source: MNHP, 2014.

Table 4 Park County Land Cover

% of Cover	Land Cover Type
15%	Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and woodland
11%	Montane Sagebrush Steppe
10%	Rocky Mountain Lower Montane, Foothill, and Valley Grassland
10%	Rocky Mountain Montane Douglas-fir Forest and Woodland
8%	Big Sagebrush Steppe
7%	Rocky Mountain Lodgepole Pine Forest
4%	Alpine Turf
4%	Cultivated Crops
4%	Recently Burned Forest
4%	Rocky Mountain Subalpine-Montane Mesic Meadow
3%	Aspen Forest and Woodland
3%	Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland
2%	Alpine Bedrock and Scree
2%	Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland
2%	Rocky Mountain Subalpine Woodland and Parkland

Source: MNHP, 2014.

If improvement options are forwarded from the study, practices outlined in MDT's standard specifications should be followed to minimize adverse impacts to vegetation. Removal of mature trees and shrubs should be limited to the extent practicable.

Noxious Weeds

Noxious weeds can degrade native vegetative communities, damage riparian areas, compete with native plants, create fire hazards, degrade agricultural and recreational lands, and pose threats to the viability of livestock, humans, and wildlife. Areas with a history of disturbance, like highway rights-of-way, are at particular risk of weed encroachment. The Invaders Database System lists 262 exotic plant species and 49 noxious weed species in Gallatin County, and 144 exotic plant species and 32 noxious weed species in Park County, some of which may be present in the study area (Attachment 9).

To reduce the spread and establishment of noxious weeds and to re-establish permanent vegetation, disturbed areas should be seeded with desirable plant species. If improvements are forwarded from the study, field surveys for noxious weeds should commence prior to any ground disturbance and coordination with Gallatin and Park County Control Boards should occur.

3.2 General Wildlife Species

Mammals

The study area is home to a variety of mammal species including white-tail deer, mule deer, elk, moose, black bear, mountain lion, gray wolf, and coyote. Other common mammals potentially occurring in the study area include porcupine, raccoon, striped skunk, badger, bobcat, red fox, beaver, muskrat, Richardson's ground squirrel, deer mouse, vole species, and a variety of bat species. Elk, mule and white-tail deer, moose, and antelope distributions are depicted in Exhibits 10, 11, 12, and 13 (in Attachment 1), respectively.

According to electronic mail communications between FWP and MDT, elk are plentiful in the southern portion of the study area, and local citizens have expressed concern about elk on the highway, especially in the winter months. Specifically, from RP 6 to RP 10 in the Kelly Canyon area, as well as near the intersection with Bridger Canyon Spur Road (RP 8.3) and Jackson Creek Road (RP 9.5), elk are frequently observed crossing the road in the winter months. The design and scoping of any future projects in this location should consider occupied habitat adjacent to and the movement of the elk herd across the highway during winter months relative to recreational traffic accessing the Bridger Bowl ski area.

Whitetail and mule deer are prevalent within the study area and the surrounding vicinity. In the morning hours (7 am to 9 am), numerous deer were observed crossing MT 86 during the June 25, 2014, field review. The majority of the deer were observed in the southern portion of the study area, from approximately RP 5 to RP 22.

Moose and black bear also inhabit the study area, with both species' habitat predominantly found from RP 5 to RP 22. Based on FWP input, moose are relatively abundant in the area, particularly in the areas of Kelly Canyon, Drinking Horse Reservoir, and Green Mountain. One moose was observed during the field review at approximate RP 28. FWP also reported several mountain lion harvested within a mile of MT 86.

A review of the MDT Maintenance animal incident database between January 1, 2004, and December 31, 2013, indicates that at least 92 animal carcasses were collected throughout the length of the MT 86 corridor (RP 1.95 to RP 37.5). Carcass locations are illustrated in Exhibit 14 (in Attachment 1). Carcass collections are concentrated between RP 1.75 and RP 12, which may be attributed to higher traffic volumes and faster speed limits in this portion of the corridor. Carcass data may not accurately reflect animal-vehicle conflicts throughout the corridor, and not all carcasses result from vehicle collisions. Animal carcasses in areas along the corridor with steeper topography or denser roadside vegetation may have evaded collection by maintenance personnel due to a lack of visibility. Additionally, recently-approved legislation has permitted the collection of game animals killed on roadsides for personal consumption. These factors may affect collections and incidents reported in the MDT maintenance animal incident database.

Table 5 summarizes the large mammal carcass collections during the ten-year period

Table 5 Large Mammal Carcasses (2004 – 2013)

Animal	Carcasses Collected	% by Species
Black bear	1	1.09
Elk	6	6.52
Mule Deer	26	28.26
Other (Wild)	3	3.26
Whitetail Deer	54	58.70
Unknown	2	2.17
Total	**92**	**100.00**

Source: MDT, 2013.

Whitetail deer (58.7%) accounted for the majority of the carcasses collected along this portion of MT 86, followed by mule deer (28.26%). The majority of the carcasses were collected between RP 1.95 and RP 11.5 (see Exhibit 14 in Attachment 1).

If improvement options are forwarded from the study, wildlife crossing structures and other wildlife mitigation strategies should be explored during the project development process. Additional coordination with the FWP area wildlife biologist should be undertaken for local expertise on the wintering elk herd in the study area.

Amphibians and Reptiles

According to the Montana Natural Heritage Program (MNHP) Natural Heritage Tracker database, which records and maps documented observations of species in a known location, amphibian species known to occur within the study area include, but are not limited to, the boreal chorus frog, American bullfrog, northern leopard frog, Columbia spotted frog, snapping turtle, painted turtle, rubber boa, gophersnake, and common gartersnake.

Birds

The MNHP Natural Heritage Tracker database indicates there are more than two hundred species of birds documented with the potential to occur and nest in the study area. These species include representative songbirds, birds of prey, waterfowl, owls, and shorebirds.

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA). Under this strict liability law, 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 a nest occupied with birds or eggs 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 or cliff swallows may also be prohibited under the MBTA.

According to FWP, there are multiple bald eagle nests located in the general vicinity; however, none are located within the study area or within approximately five miles of the study area (see Exhibit 15 in Attachment 1). While bald eagle nests are not found within the study area, information from the Montana Field Guide states, “numerous eagles have been observed migrating over Rogers Pass and the Bridger Mountains” (Hawk Watch International 2003). Bald and golden eagles are protected under the MBTA and managed under the Bald and Golden Eagle Protection Act, which 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."

Information forwarded from MDT indicates that multiple nesting raptors have been observed in the northern portion of the corridor, specifically from RP 25 to RP 38. Any improvements forwarded from this study should consider potential constraints that may result from nesting/breeding periods of migratory birds and presence of bald and golden eagles nests.

Fisheries

Many perennial, intermittent, and ephemeral streams intersect the study area (see Exhibit 5 in Attachment 1). Table 6 depicts fisheries information for named streams within the study area (see Attachment 10).

Table 6 Fisheries Data

Named Stream within Study Area	RP*	RM**	Fish Species Present
Brackett Creek	18.8	19.68	Brook Trout, Brown Trout, Longnose Sucker, Mottled Sculpin, Mountain Whitefish, Rainbow Trout, White Sucker, Yellowstone Cutthroat Trout
Bridger Creek	3.15	2.19	Brook Trout, Brown Trout, Longnose Dace, Mottled Sculpin, Mountain Whitefish, Rainbow Trout
Cache Creek	24.3	4.3	Brook Trout, Brown Trout, Mottled Sculpin, Yellowstone Cutthroat Trout
Carrol Creek	27.0	1.45	Brook Trout, Mottled Sculpin, Yellowstone Cutthroat Trout
Dry Creek	32.5	0.63	Brook Trout, Mottled Sculpin
East Gallatin River	2.7	43.42	Brook Trout, Brown Trout, Longnose Dace, Longnose Sucker, Mottled Sculpin, Mountain Sucker, Mountain Whitefish, Rainbow Trout, White Sucker, Yellowstone Cutthroat Trout
Fairy Creek	25.15	0.86	Brook Trout, Brown Trout, Mottled Sculpin, Yellowstone Cutthroat Trout
Flathead Creek	31.0	1.24	Brook Trout, Brown Trout, Lake Chub, Longnose Dace, Longnose Sucker, Mottled Sculpin, Mountain Sucker, Mountain Whitefish, White Sucker, Yellowstone Cutthroat Trout
Lyman Creek	3.1	0.05	No data available
Maynard Creek	16.0	2.91	Surveyed; no fish captured
Middle Fork Brackett Creek	18.8	0.13	Brook Trout, Mottled Sculpin, Westslope Cutthroat Trout, Yellowstone Cutthroat Trout
Muddy Creek	37.2	0.01	Brook Trout, Brown Trout, Longnose Sucker, Mottled Sculpin, Mountain Sucker, Mountain Whitefish, White Sucker
North Fork Brackett Creek	19.0	0.13	Brook Trout, Brown Trout, Mottled Sculpin, Mountain Whitefish, Yellowstone Cutthroat Trout
Olson Creek	14.1	0.25	Surveyed; no fish captured
Place Creek	5.9	0.14	No data available
South Fork Brackett Creek	18.8	0.07	Yellowstone Cutthroat Trout
South Fork Dry Creek	32.05	0.27	No data available
Stone Creek	11.35	0.19	Brook Trout
White Creek	19.95	0.33	Brook Trout, Rainbow Trout

Source: FWP Montana Fisheries Information System (MFISH), 2014.
*RP: Approximate reference post where MT 86 crosses the stream, or where the stream enters the study area, if not actually crossed.
** RM: Approximate river mile of MT 86 crossing, or closest point to MT 86, if not actually crossed.

According to MNHP, the Brackett Creek and Flathead Creek drainages contain populations of genetically-pure Yellowstone cutthroat trout. Other unnamed stream crossings exist that could also support fish species within the study area. Fish passage and/or barrier opportunities should be considered in cooperation with resource agencies at affected drainages if improvements are forwarded from this study. Permitting from regulatory agencies for any future corridor improvements may also require incorporation of design measures to facilitate aquatic species passage.

Crucial Areas Planning System

The FWP Crucial Areas Planning System (CAPS) is a resource intended to provide non-regulatory information during early planning stages of projects, conservation opportunities, and environmental review. The finest data resolution within CAPS is at the square-mile section scale or water body. Use of these data layers at a more localized scale is not appropriate and may lead to inaccurate interpretations since the classification may or may not apply to the entire square-mile section. The CAPS system was consulted to provide a general overview of the study area. CAPS results are presented in Attachment 11.

The online CAPS mapping tool provides FWP general recommendations and recommendations specific to transportation projects for both terrestrial and aquatic species and habitat. These recommendations can be applied generically to possible future improvements carried forward from the study.

3.3 Threatened and Endangered Species

The federal list of threatened and endangered (T&E) species is maintained by the USFWS. Species on this list receive protection under the Endangered Species Act. An "endangered" species is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is likely to become endangered in the foreseeable future. The USFWS also maintains a list of species that are candidates or proposed for possible addition to the federal list. According to the USFWS, six threatened, proposed threatened, or candidate species are listed as occurring in Gallatin and Park Counties (see Table 7 and Attachment 12).

Table 7 Threatened and Endangered Species in Gallatin and Park Counties

Species		Status
Wildlife Species	Greater sage-grouse	Candidate
	Sprague's pipit	Candidate
	Grizzly bear	Threatened
	Canada lynx	Threatened
Plant Species	Whitebark pine	Candidate
	Ute ladies'-tresses	Threatened

Source: USFWS, 2014.

According to the USFWS database, all of the federally-listed species potentially occurring in Gallatin and Park Counties have occurrence buffers overlapping the study area (see Exhibit 15 in Attachment 1). If improvements are forwarded from the study, an evaluation of potential effects to T&E species will need to be completed during the project development process. As federal status of protected species changes over time, reevaluation of the listed status and afforded protection to each species should be completed prior to issuing a determination of effect relative to potential impacts.

3.4 Species of Concern

Montana species of concern (SOC) are native plants or native animals breeding in the state that are considered to be "at risk" due to declining population trends, threats to their habitats, and/or restricted distribution. Designation of a species as a Montana SOC is not a statutory or regulatory classification. Instead, these designations provide a basis for resource managers and decision-makers to direct limited resources to priority data collection needs and address conservation needs proactively. Each species is assigned a state rank that ranges from S1 (greatest concern) to S5 (least concern). Other state ranks include SU (unrankable due to

insufficient information), SH (historically occurred), and SX (believed to be extinct). State ranks may be followed by modifiers, such as B (breeding) or N (non-breeding).

A search of the MNHP species of special concern database on June 27, 2014, revealed 21 SOC in Gallatin and Park Counties with potential to occur in the study area based on presence of suitable habitat (Table 8 and Attachment 13).

Table 8 Species of Concern Overlapping the Study Area

Animal Subgroup	Common Name	State Rank	Habitat Description
Amphibians	Western toad	S2	Wetlands, floodplain pools
Birds	Great blue heron	S3	Riparian forest
	Northern goshawk	S3	Mixed conifer forests
	Ferruginous hawk	S3B	Sagebrush grassland
	Great gray owl	S3	Conifer forest near open meadows
	Clark's nutcracker	S3	Conifer forest
	Brown creeper	S3	Moist conifer forests
	Veery	S3B	Riparian forest
	Sage thrasher	S3B	Sagebrush
	Brewer's sparrow	S3B	Sagebrush
	Sagebrush sparrow	S3B	Sagebrush
	Bobolink	S3B	Moist grasslands
	Cassin's finch	S3B	Drier conifer forest
Fish	Yellowstone cutthroat trout	S2	Mountain streams, rivers, lakes
	Westslope cutthroat trout	S2	Mountain streams, rivers, lakes
Mammals	Wolverine	S3	Boreal forest and alpine habitats
Invertebrates	Warm Spring Zaitzevian riffle beetle	S1	Springs
	Brown's microcylloepus riffle beetle	S1	Springs
Plants	Rocky Mountain twinpod	S3	Gravelly slopes/talus
	Small yellow lady's-slipper	S3S4	Fens and moist forest-meadows
	Slender wedgegrass	S3S4	Wet sites (low-elevation)

Source: MNHP, 2014.

Of particular note, the only known global population of the Warm Spring Zaitzevian riffle beetle occurs within the project area in spring and seepage habitat (total area = 35 square meters) in and along Bridger Creek where it flows through the USFWS-owned Bozeman Fish Technology Center (Montana Field Guide, 2014). Because this is the only globally-known location of this species, every effort should be made to avoid disturbance to this beetle and its habitat. Any potential disturbance to the beetle or its habitat should be coordinated with Montana FWP and the USFWS.

Other sensitive species, including bald eagles, are not listed in Table 8, but have the potential to occur within the study area. A thorough field investigation for the presence and extent of these species should be conducted if improvement options are forwarded from this study. If present, special conditions to the project design or during construction should be considered to avoid or minimize impacts to these species.

4.0 Social and Cultural Resources

4.1 Population Demographics and Economic Conditions

Under NEPA/MEPA and associated implementing regulations, state and federal agencies are required to assess potential social and economic impacts resulting from proposed actions. FHWA 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 human populations that might be affected by improvements within the study area.

Title VI of the United States Civil Rights Act of 1964, as amended (USC 2000(d)) and EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, require that no minority, or, by extension, low-income person shall be disproportionately adversely impacted by any project receiving federal funds. For transportation projects, this means that no particular minority or low-income person may be disproportionately isolated, displaced, or otherwise subjected to adverse effects. If a project is forwarded from the improvement option(s), environmental justice will need to be further evaluated during the project development process.

Table 9 summarizes population and demographic data for Gallatin and Park Counties based on 2010 Census data and includes Montana for comparison.

Table 9 2010 Census Data for Gallatin and Park Counties

Element		Gallatin	Park	Montana
Population	County	89,513	15,636	989,415
	Bozeman City	37,280		
	Belgrade City	7,389		
	Three Forks City	1,869		
	Livingston City		7,044	
	Clyde Park Town		288	
Race	White	97%	98%	89.4%
	Black or African American	0.3%	0.1%	0.4%
	American Indian & Alaska Native	2%	1%	6.3%
	Asian	1%	0.3%	0.6%
Ethnicity	Hispanic or Latino	2%	1%	2.9%

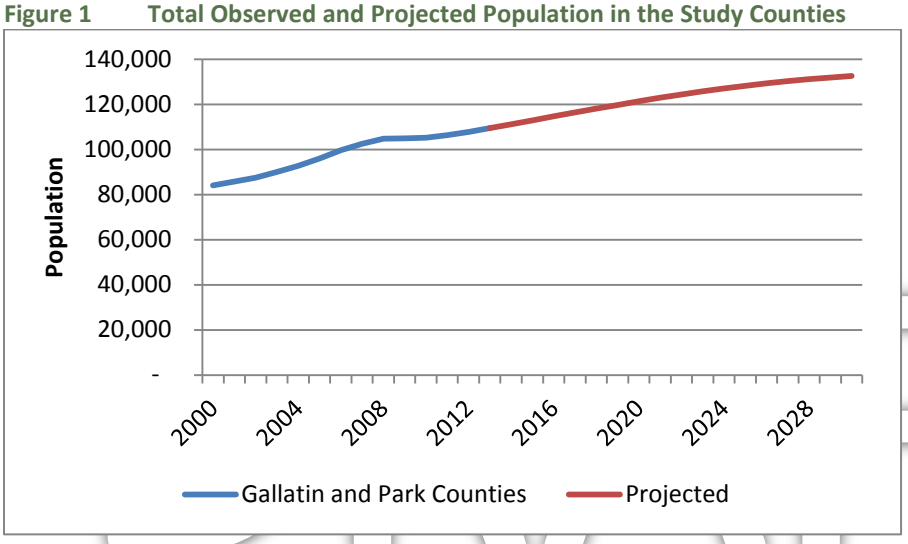
Source: U.S. Census Bureau, 2010.

As of the 2010 Census, Gallatin and Park County were ranked as being the 4th and 12th most populous counties in Montana. A large share of the population in Gallatin County (52 percent) resides within the cities of Bozeman, Belgrade, and Three Forks. Livingston and Clyde Park make up 47 percent of Park County's population.

According to the 2000 United States Census Bureau (USCB), the population of Gallatin County was 68,375 and the population of Park County was 15,710. By the 2010 Census, the population of Gallatin and Park County was 89,513 and 15,636, respectively. This indicates that Gallatin County's population has increased by approximately 31 percent over the last decade, while the

population of Park County has remained relatively constant over a 10-year period. However, regionally, the combined population from both counties shows an increase by a mean of 2 percent each year from 2000 to 2013. From 2012 to 2030, the region's population is projected to increase by approximately 25,000 people. This is an increase of approximately 158 percent of the region's 2000 population. This increase follows an upward trend of population growth typical throughout western Montana. Figure 1 shows the combined populations of both counties from 2000 to 2013 (in blue) and the projections to year 2030 (in red) based on data services through the Montana Department of Commerce.

Figure 1 Total Observed and Projected Population in the Study Counties

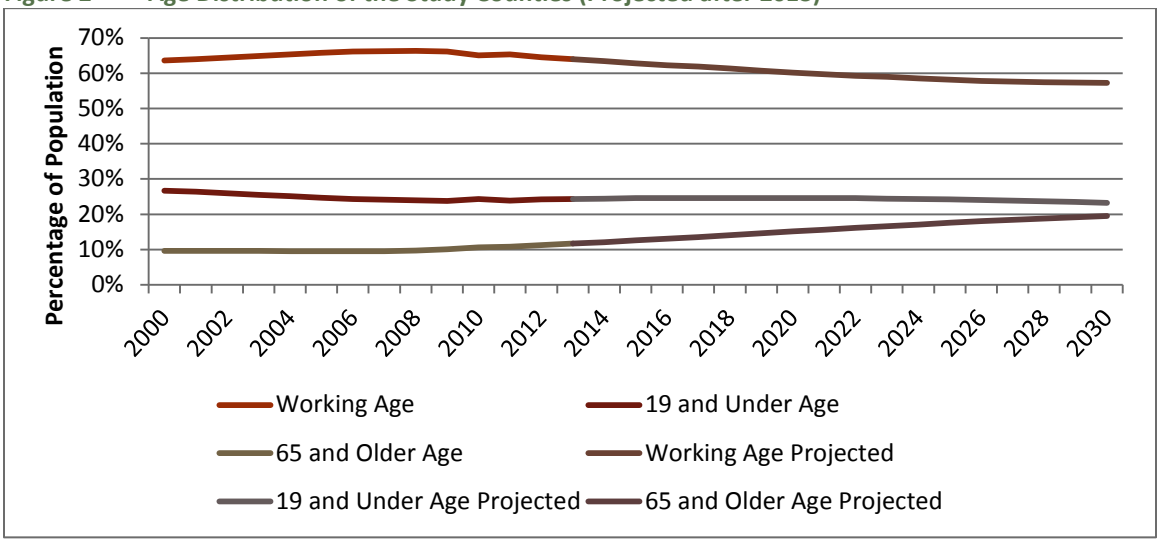


Source: US Census Bureau, 2010.

Gallatin and Park Counties' population ethnicity in 2010 is primarily white/Caucasian (97 percent and 98 percent, respectively), with American Indian and Alaska Native individuals comprising 1 to 2 percent of the population. A number of races make up the remainder of the population.

The population in the Gallatin County and Park County region is aging, with age distribution projections showing population category 65 and over expected to double by 2030. A decline in the percentage of the working aged population of the two counties (ages 20 to 64) from a peak of approximately 65 percent in the last decade to just over half by 2030 is also expected. The projected age distribution is illustrated in Figure 2.

Figure 2 Age Distribution of the Study Counties (Projected after 2013)



Source: US Census Bureau, 2010.

From 2006 to 2010, the USCB, by means of the American Community Survey (ACS), produced the 5-year estimate for employment by industry for Gallatin and Park Counties. The study indicated that Gallatin County has approximately 42,467 employed individuals in the labor force, while Park County consisted of 5,172 employed individuals. For Gallatin County, the top fields of employment are public administration, followed by the arts, entertainment, recreation, and foods industry. For Park County the top fields of employment are the arts, entertainment, recreation, and foods industry, followed by public administration. Table 10 displays employment within Gallatin County and Park County by industry, according to the ACS.

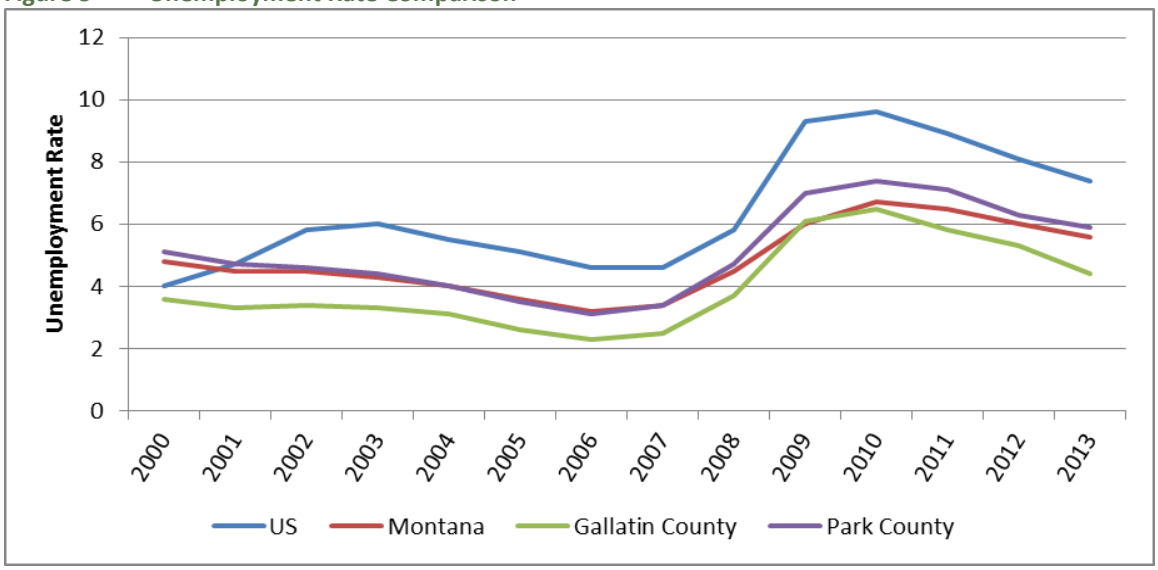
Table 10 County Employment by Industry (2006-2010)

Industry	Total Estimate	
	Gallatin	Park
Agriculture, forestry, fishing, and hunting	483 (1.1%)	154 (3.0%)
Construction	3,285 (7.8%)	296 (5.8%)
Manufacturing	2,244 (5.3%)	248 (4.9%)
Wholesale trade	1,348 (3.2%)	33 (0.7%)
Retail trade	6,548 (15.5%)	646 (12.7%)
Transportation and warehousing, and utilities	921 (2.2%)	39 (0.8%)
Information	559 (1.3%)	81 (1.6%)
Finance and insurance, and real estate and rental and leasing	2,140 (5.1%)	207 (4.1%)
Professional, scientific, and management , and administrative and waste management services	4,444 (10.5%)	228 (4.5%)
Educational Services, health care and social assistance	4,553 (10.8%)	733 (14.5%)
Arts, entertainment, recreation, and accommodation and food services	6,566 (15.6%)	1,314 (25.9%)
Other services, except public administration	1,468 (3.5%)	354 (7.0%)
Public Administration	7,608 (18.0%)	739 (14.6%)
Civilian employed population (16 years and over)	**42,167**	**5,072**

Source: US Census Bureau, ACS Survey, 2006-2010.

Figure 3 illustrates the unemployment rate comparison from 2000 to 2013. Unemployment in the Gallatin and Park County region has been similar to the statewide unemployment rate for the last decade. As the recession began in 2007 and unemployment increased, Montana, Gallatin County, and Park County all did relatively well in comparison to the nation as a whole with an unemployment rate below the national average. However, after 2007 Park County has continuously had a higher unemployment rate than the state average. Gallatin County has stayed below both the national and state average over time. The most recent unemployment figures from the state and federal labor departments suggest favorable current employment conditions in the study area. In 2013, the average unemployment rate for Gallatin County and Park County was 4.4 and 5.8 percent, respectively. Although Park County has a slightly higher rate than the Montana rate, both counties fall short of the national unemployment rate of 7.4 percent.

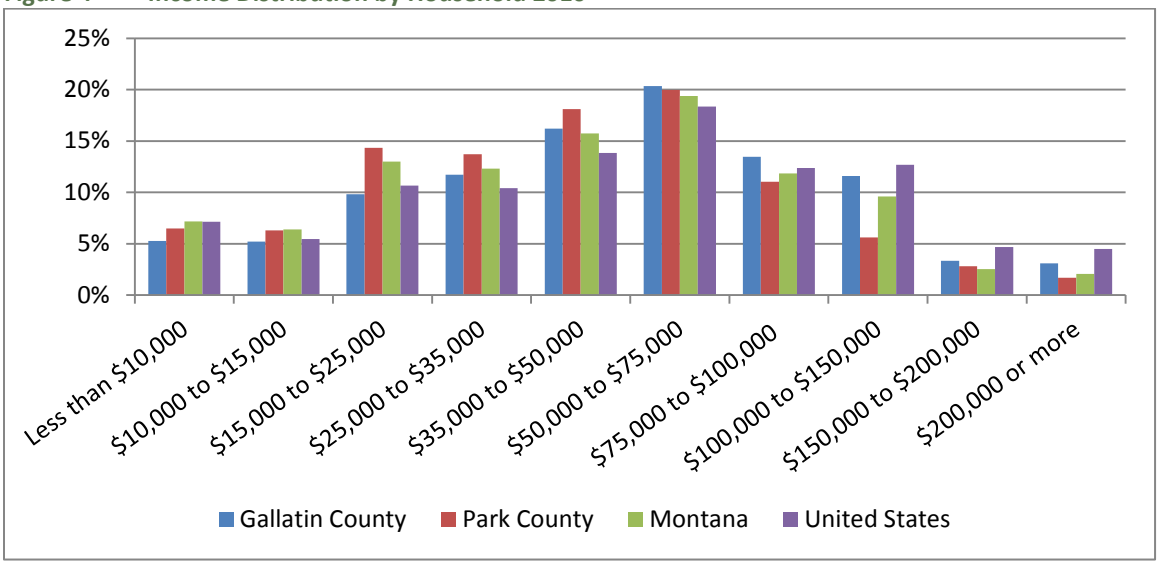
Figure 3 Unemployment Rate Comparison



Source: US Census Bureau, ACS Survey, 2000-2013.

Figure 4 shows the percentage of the population in Gallatin County, Park County, Montana, and the United States in 10 income categories from the 2010 Census. Park County generally has a smaller percentage of the population in the top four income categories compared to the state of Montana or the United States. Gallatin County commonly has a higher percentage than Montana in the majority of income categories. Park County has a higher percentage of household income in the $15,000 to $50,000. However, Gallatin County and Park County are relatively close in comparison to the United States and the State of Montana in all income categories above $15,000.

Figure 4 Income Distribution by Household 2010



Source: U.S. Census Bureau, 2010.

4.2 Land Ownership and Land Use

Ownership of land in the study area is predominantly private, with some interspersed state and federal owners. Specifically, the USFWS owns a parcel of land associated with the Bozeman Fish

Technology Center from approximately RP 4.1 to RP 4.6, and, as part of the Gallatin National Forest, the USFS owns from approximate RP 18.4 to RP 19.5 and from RP 19.7 to RP 20.9. Additionally, state-owned land is located within the northern portion of the study area from RP 34.0 to RP 34.4. Much of the private land adjacent to MT 86 includes low- to moderate-intensity development. Land ownership maps for the study area are provided in Exhibit 16 (in Attachment 1).

Mixed land use arises from the varied land ownership throughout the study area. These land uses include commercial, industrial, crop/pasture, mine/quarry, mixed urban, and recreational (see Exhibit 9 in Attachment 1). If improvements are forwarded from this study, land use adjacent to possible projects will need to be considered during design.

4.3 Recreational Resources

Bridger Canyon provides access to the Bridger Mountains and the Gallatin National Forest, and offers a variety of recreational opportunities, including hiking, downhill skiing at the Bridger Bowl ski area, cross-county skiing at Bohart Ranch, birding and wildlife viewing, cycling, snowshoeing, fishing, hunting, hiking, and camping.

Recreational resource information was gathered during the field review and through review of USFS and FWP resource lists for Gallatin and Park Counties. Table 11 lists publically-owned recreational resources identified in the study area. These recreational areas may be protected under Section 4(f) of the U.S. Department of Transportation Act of 1966, which was enacted to protect publically-owned parks, recreation areas, wildlife and waterfowl refuges, and public and private historic sites of local, state, and national significance. Federally-funded transportation projects cannot impact these properties unless there are no feasible and prudent avoidance alternatives and all possible planning to minimize harm has occurred. Prior to approving a project that "uses" a Section 4(f) resource, FHWA must find that there is no prudent or feasible alternative that completely avoids the 4(f) resource. "Use" can occur when land is permanently incorporated into a transportation facility or when there is a temporary occupancy of the land that is adverse to a Section 4(f) resource. Constructive "use" can also occur when a project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are "substantially impacted." Potential effects on recreational use would need to be considered in accordance with Section 4(f) if improvements are forwarded from this study. Potential Section 4(f) resources are mapped in relation to the study area in Exhibit 17 (in Attachment 1).

Table 11 Potential Section 4(f) Recreational Resources

Resource	Approximate RP
Story Mill Spur Trail	1.95
Bozeman Fish Technology Center Trails (including College "M" Trailhead and Trail System)	4.2
Stone Creek USFS Access	11.7
Olson Creek USFS Access	14.3
USFS Battle Ridge Campground, Picnic Area, and USFS 500 Trailhead	20.5
Fairy Lake USFS Trailhead	21.6

Source: USFS, 2014.

The National Land and Water Conservation Fund Act (LWCFA), or Section 6(f), was enacted to preserve, develop, and assure the quality and quantity of outdoor recreation resources. Section

6(f) protection applies to all projects that impact recreational lands purchased or improved with LWCFA funds. The Secretary of the Interior must approve any conversion of LWCFA property to a use other than public, outdoor recreation. According to FWP LWCFA Sites by County, no Section 6(f) resources were identified in the study area. To confirm the accuracy/completeness of the literature, additional coordination with FWP will be necessary if improvements are forwarded from this study.

4.4 Cultural Resources

If MDT projects forwarded from the study are federally funded, MDT would need to conduct a cultural resource survey of the area of potential effect (APE) for this project as specified in Section 106 of the National Historic Preservation Act (36 CFR 800). Section 106 requires federal agencies to "take into account the effects of their undertakings on historic properties." The purpose of the Section 106 process is to identify historic and archaeological properties that could be affected by the undertaking, assess the effects of the project and investigate methods to avoid, and minimize or mitigate any adverse effects on historic properties. These properties are also afforded protection under Section 4(f) of the Transportation Act.

A file search through the Montana State Historic Preservation Office revealed two historic properties located within 0.15 miles of the existing alignment (24GA1394 and 24GA0802). Table 12 lists the properties, their approximate locations, and National Register of Historic Places (NRHP) eligibility. All of the sites have been previously recorded and their NRHP status established. There are also two NRHP historic and archaeological properties (24GA1075 and 24GA0461) located within one mile of the existing MT 86 alignment but outside the survey area for this corridor study. An examination of the Montana Cadastral Survey information for the designated corridor indicates that at least 76 historic-age properties are located within 0.15 mile of the existing MT 86 alignment.

Table 12 Recorded Cultural Resource Sites

Site Name	Site No.	RP	Township	Range	Section	NRHP Eligibility
Flaming Arrow Ranch House & Office	24GA1394	15.3±	1N	7E	29	Listed
Sedan School	24GA0802	22.6±	2N	7E	3	Listed
Flaming Arrow Lodge	24GA1075	15.5±	1N	7E	29	Listed
Battle Ridge Station	24GA0461	N/A	2N	7E	32	Eligible

Source: Montana SHPO, 2014.

The rural nature of the landscape and size of the current road suggest that there are likely unrecorded archaeological sites within the project corridor. Based on an MDT field review on May 12, 2014, the east end of the project corridor has a higher likelihood of archaeological sites than the west end.

Alluvial terraces adjacent to perennial streams are particularly prone to harboring buried pre-contact campsites. There is a high likelihood of encountering buried archaeological sites near the following stream crossings: Dry Creek, Carrol Creek, Fairy Creek, and Cache Creek. Brackett Creek, and Bridger Creek and its various tributaries, all have the potential to harbor buried archaeological deposits at MT 86 crossings. Buried archaeological sites are often costly to test and excavate. Tipi ring sites may be located where MT 86 approaches the valley wall of Flathead Creek. These sites may be located at or near the ground surface, which generally makes them

less costly to test and/or excavate than more deeply buried sites. Tribal consultation will be necessary for the Battle Ridge Pass area.

Most sites in the study corridor will not be identified until MDT conducts an intensive pedestrian cultural resource inventory of this route. Cultural resource professionals will need to physically walk several 30-meter transects on either side of the proposed route to look for artifacts, particularly high-probability landforms. Some alluvial or colluvial landforms may require backhoe testing to determine the presence or absence of deeply-buried archaeological deposits. A detailed inventory of cultural resources cannot be determined within the corridor without substantial fieldwork, time, and expense.

If a project is forwarded from the corridor study, a cultural resource survey for unrecorded historic and archaeological properties within the APE will need to be completed during the project development process. Flexibility in design will be important to avoid and/or minimize impacts to significant sites in the study corridor.

4.5 Noise

Traffic noise may need to be evaluated for any future improvements to the Bridger Canyon corridor. Noise analysis is necessary for "Type I"-classified projects. If future roadway improvements are limited (e.g., the horizontal and vertical alignments are not changed and the highway remains a two-lane facility), then the project would not be considered a Type I project. If forwarded improvements include a substantial shift in the horizontal or vertical alignments, increasing the number of through lanes, providing passing lanes, or increasing traffic speed and volume, then the project would be considered a Type I project.

Type I projects require a detailed noise analysis, consistent with FHWA requirements and MDT policy, which includes measuring ambient noise levels at selected receivers and modeling design year noise levels using projected traffic volumes. Noise abatement measures would be considered for the project if noise levels approach or substantially exceed noise abatement criteria. The noise abatement measures must be considered reasonable and feasible prior to implementation.

4.6 Visual Resources

The visual resources of an area include landforms, vegetation, water features, and physical modifications caused by human activities that give the landscape its visual character and aesthetic qualities. Visual resources are typically assessed based on the 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 landscape throughout the study area contains an array of biological, topographic, historic, ecological, and cultural resources in a relatively remote location. MT 86 serves as the access point to the Bridger Bowl ski area from Bozeman and the greater Gallatin valley. MT 86 also provides access to the Gallatin National Forest, with numerous trailheads, access points, and a campground accessed via the highway. While the area surrounding the corridor has been slightly developed, the rural and scenic landscape remains, offering aesthetically-pleasing views to residents and motorists.

A rock formation, known as "Maiden Rock," is located near RP 4.4 on the north side of MT 86. Some accounts indicate the named formation is a stone spire or pinnacle at the entrance to the canyon (see upper right). A Museum of the Rockies archival photograph circa 1900 shows a formation that appears to resemble a maiden's head (see lower right). Although the spire still remains, much of the larger formation was damaged or removed during blasting by road crews in the 1970s.

Source: Museum of the Rockies Photo Archive Online, accessed August 2014. *Title*: Pinnacle at entrance to Bridger Canyon *Date*: ca 1890s *Photographer*: Charles D. Loughrey

Source: Museum of the Rockies Photo Archive Online, accessed August 2014. *Title*: Maiden Rock, Bridger Canyon near Bozeman, Montana *Date*: ca 1900 *Photographer*: Maurice Lamme

Evaluation of the potential effects on visual resources would need to be conducted if improvement options are forwarded from this study.

5.0 Conclusion

This environmental scan report identifies physical, biological, social, and cultural resources within the study area that may be affected by potential future improvements to MT 86.

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 NEPA/MEPA environmental documentation.

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