Biological Resource Report / Preliminary Biological Assessment

South Avenue Bridge Project

Bitterroot River - W of Missoula

BR 9032(65)

UPN 6296000

Missoula County, Montana

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EXECUTIVE SUMMARY

The following Biological Resource Report/Preliminary Biological Assessment provides an evaluation of the proposed South Avenue Bridge Project's potential effects on general terrestrial and aquatic resources, species of concern and special status species, and threatened and endangered species. Environmental resource information for the study area and vicinity was gathered through a combination of literature/database review, agency consultation, and on-site field investigation.

Project Purpose

The purpose of the project is to enhance the operational characteristics, increase safety and improve physical conditions for the traveling public over the foreseeable future by constructing a new river crossing that meets current design standards as well as meeting the current and future traffic demands for the area.

Project Description and Location

Missoula County, in cooperation with the Montana Department of Transportation and Federal Highway Administration, is proposing to construct a new bridge across the Bitterroot River at the western terminus of South Avenue to connect with River Pines Road immediately west of the river. The proposed South Avenue Bridge would involve construction of a new 2-lane bridge (one travel lane in each direction) that provides for bicycle/pedestrian accommodations separated from vehicular traffic. The bridge design currently being evaluated is a four span welded plate girder design approximately 746 feet long. The project limits extend between the intersection of South Avenue and Hanson Drive to the east and River Pines Road to the west. A segment of River Pines Road will be realigned to include T-intersection on the west side of the river. The project includes removal of the existing single-lane Maclay Bridge on North Avenue located approximately 0.4 mile downstream of the proposed bridge location. The conceptual alignment centerline and associated study area are shown in Figure ES-1.

The project is located within Missoula County, outside of the city limits of Missoula. The project is located in Sections 26, 27, 34, and 35 of Township 13 North, Range 20 West, Montana Principle Meridian, and is centered at approximately 46.8491° North latitude and 114.1043° West longitude.

Summary of Potential Impacts

In general, permanent, long-term impacts on terrestrial and aquatic populations resulting from the proposed project are anticipated to be minor. The project as currently proposed includes a four-span bridge structure that will require two instream piers within the active channel of the Bitterroot River. Installation of the two bridge piers will result in permanent impacts to the riverbed of the Bitterroot River. Rip rap would not be necessary around the piers as they would be designed for the anticipated scour. Due to the setback of the abutments from the river, protective rip rap at the abutments would be outside the ordinary high water mark of the river channel. The west bridge abutment is located in close proximity to the river and rip rap placed around this abutment would have minor impact on the river bank, but no impact below the ordinary high water mark. No permanent impact to the bed or bank of the Bitterroot River is anticipated at the east bridge abutment as it is located well outside of the channel. The proposed bridge is being designed to span the approximately 730-foot-wide floodway and minimize the structure footprint within the floodplain.

It is estimated that the proposed project would clear approximately 2.8 acres of grasses and forbs within the existing right-of-way and adjacent fields on the east and west sides of the river and approximately 1.0 acre of shrub and forested area, 0.3 acre of which is riparian vegetation on the right and left banks immediately adjacent to the Bitterroot River. Permanent removal of native vegetation would be limited to the extent practicable to construct the project and thus is not anticipated to have a long-term negative impact to overall riparian habitat along the Bitterroot River. Temporary impact on riparian vegetation at the existing Maclay Bridge site is anticipated during removal of the bridge and bridge piers and abutments. Restoration through planting of riparian species would occur where practicable in disturbed areas adjacent the Bitterroot River and O'Brien Creek following construction of the South Avenue Bridge and removal of the Maclay Bridge. Impacts on wildlife (mammals, birds, reptiles and amphibians) and fish as a result of the proposed project are not anticipated to have a measurable affect on any species' population or long-term viability in the study area.

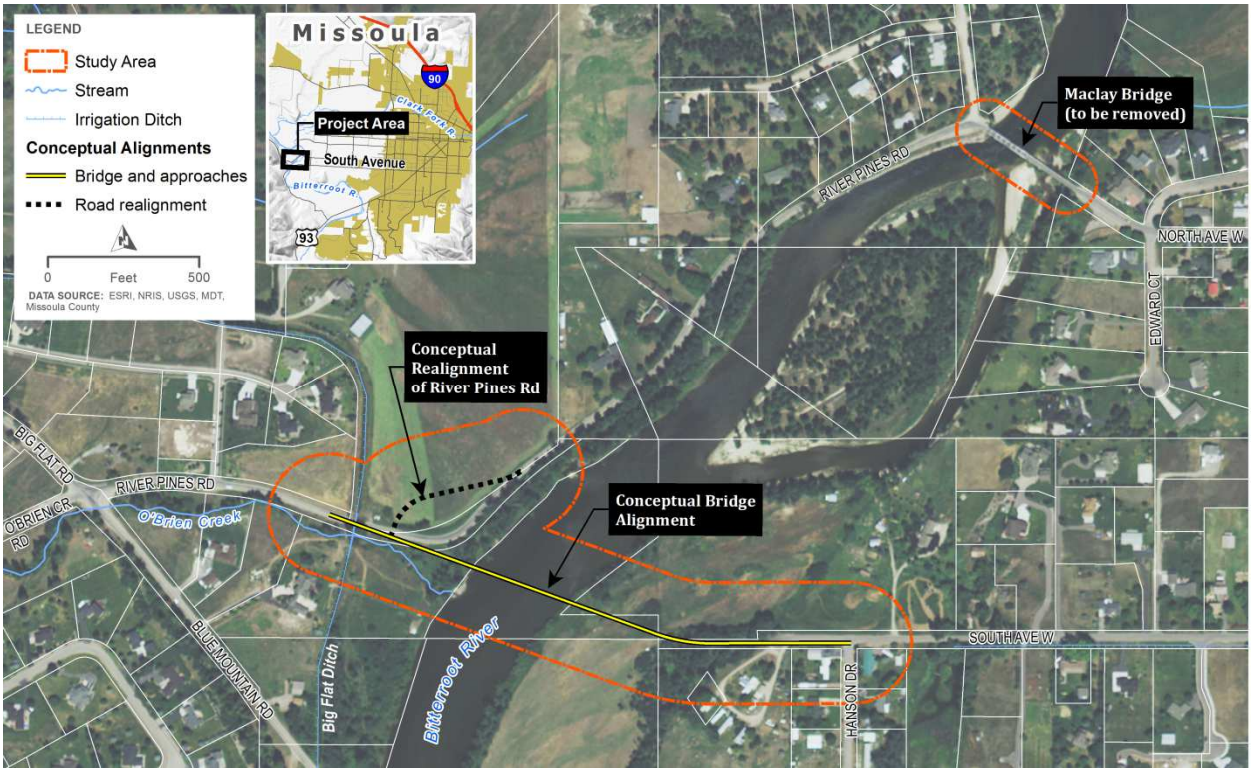

Figure ES-1. Study Area

The most substantial project-related impacts would be temporary in nature, occurring within and adjacent to the Bitterroot River as a result of the construction of the new bridge structure and removal of the existing Maclay Bridge. Short-term impacts on aquatic resources would result from construction-related activities and direct disturbance to the bed and banks of the Bitterroot River. Temporary increases in turbidity and suspended sediments may occur during construction. Impacts will be minimized to the greatest extent practicable through use of standard best management practices, project timing during low flow periods, and other conservation measures, as well as any special conditions stipulated by the various state and federal water quality permits required to construct the proposed project.

Legal access to multiple privately-owned parcels was not granted prior to conducting the field investigations and, as such, only portions of the study area were investigated for the presence of

wetlands. Within these legally accessible areas, two distinct riparian fringe wetlands were identified adjacent to the Bitterroot River, below the OHWM in the vicinity of the new bridge alignment. No wetlands were identified in the vicinity of the existing Maclay Bridge. Precise construction limits are not presently defined; however, based on preliminary design, no permanent impact on wetlands is anticipated as a result of the proposed project. As design progress, it is possible that minor impacts to wetlands could be identified. It is anticipated that any permanent impact on wetlands and other jurisdictional "waters of the U.S." will be well below the 0.5 acre threshold and would therefore meet the criteria for coverage under a Nationwide Permit.

The proposed project's effect on federally listed threatened, endangered, proposed and candidate species that may potentially occur within the project vicinity was evaluated. Based upon preliminary project evaluation and coordination with the U.S. Fish and Wildlife Service, it has been determined that the proposed action will have ***no effect*** on the Canada lynx (*Lynx canadensis)*, whitebark pine (*Pinus albicaulis*), grizzly bear (*Ursus arctos horribilis*), wolverine (*Gulo gulo*), red knot (*Calidris canutus rufa*), and water howellia (*Howellia aquatilis*), and a ***may affect*** determination has been rendered for the yellow-billed cuckoo (*Coccyzus americanus occidentalis*), bull trout (*Salvelinus confluentus)* and designated bull trout critical habitat. A final Determination of Effect with regard to yellow-billed cuckoo, bull trout and designated bull trout critical habitat will be made at a later phase in project development in coordination/consultation with the U.S. Fish and Wildlife Service.

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1 Introduction

1.1 Project Description and Location

Missoula County, in cooperation with the Montana Department of Transportation (MDT) and Federal Highway Administration (FHWA), is proposing to construct a new bridge across the Bitterroot River at the western terminus of South Avenue to connect with River Pines Road immediately west of the river. The proposed South Avenue Bridge will involve construction of a new 2-lane bridge (one travel lane in each direction) that provides for bicycle/pedestrian accommodations separated from vehicular traffic. The project limits extend between the intersection of South Avenue and Hanson Drive to the east and the intersection of River Pines Road and Blue Heron Lane to the west. The proposed project includes new right-of-way (ROW) acquisition. The project includes removal of the existing single-lane Maclay Bridge on North Avenue located approximately 0.4 mile downstream of the proposed bridge. The conceptual alignment centerline and associated study area are shown in Figure 1-1. Refer to Appendix A for additional reference maps.

The project is located within Missoula County, outside of the city limits of Missoula. The project is located in Sections 26, 27, 34 and 35 of Township 13 North, Range 20 West, Montana Principle Meridian, and is centered at approximately 46.8491° North latitude and 114.1043° West longitude.

Construction of the project is anticipated to occur over two seasons, with construction of the new bridge occurring in year one and removal of the Maclay Bridge in the second year. Work within the river would be scheduled to occur during the summer in-water work window (July 1 and September 30) (USFWS 2015a). The methods for constructing the new bridge and removing Maclay Bridge are currently unknown and would depend largely on contractor approach. It is likely that the extent of in-water work could include temporary work structures such as cofferdams, diversion blocks, work trestles, or other means to access and work within, or over, the Bitterroot River. To the extent possible, construction staging for the project will occur within existing ROW and limited to previously disturbed areas. Additional details specific to each major work element are further described below.

South Avenue Bridge Construction

The bridge design currently being evaluated is a four span welded plate girder design approximately 746 feet long. The proposed bridge is being designed to span the approximately 730-foot-wide regulatory floodway and minimize the structure footprint within the floodplain. The proposed bridge structure would include three piers: two located within the active river channel and one located approximately 160 feet landward east of the river channel above the ordinary high water mark (OHWM). The bridge abutments and associated rip rap would be constructed at an elevation above the OHWM. The pier type and size are not finalized and the foundations will be determined following final geotechnical recommendations. However, two pier options are currently being evaluated, which include:

- Drilled shaft foundation: Each pier would include two drilled shafts 7-feet in diameter spaced 30 feet apart on centers and aligned with the direction of flow of the river. Piers would be constructed first by installing the steel casings using a vibratory hammer to isolate the work area. The foundations would then be drilled out within the casings and filled with concrete.
- Driven pile foundation: Each pier would include a 3-foot by 25-foot wall on top of a pile-supported foundation aligned with to the flow of the river. Piers would be constructed first by installing cofferdams to isolate the work area, piles would be driven likely using a combination of impact and vibratory hammers, and the foundations would be formed of concrete.

On the west side of the Bitterroot River, the bridge alignment and approaches have been shifted north of the existing River Pines Road to increase separation between O'Brien Creek and new construction. River Pines Road will be realigned to include a T-intersection on the west side of the river to provide access to residences along River Pines Road and Riverside Drive. The existing Big Flat Ditch irrigation culvert will be extended to the north to accommodate the alignment shift. These roadway realignments will result in the abandonment and obliteration of two segments of River Pines Road. Following construction, these areas would be restored with native riparian species, which would create an increased vegetative buffer between the road and the Bitterroot River and O'Brien Creek.

Stormwater would be managed by conveying it off the bridge (i.e., away from the active river channel) and dispensed onto adjacent upland areas at either bridge end. There may be a need for a stormwater detention area on the west side of the bridge; however, further analysis is necessary to determine the stormwater requirements.

Maclay Bridge Removal

Once the new South Avenue Bridge is constructed and operational the existing Maclay Bridge will be fully removed, including the piers, piles, and abutments. The structure would be dismantled and/or demolished from the top down beginning with removal of the main span, pony truss, and concrete single tee spans. Equipment will be required to access the piers but will avoid working in the main river channel. To minimize the impact on the river, the piers and piles would likely be isolated using cofferdams or diversion blocks and excavated to a minimum depth of 3 feet below the thalweg. Both bridge abutments would be removed. The west abutment currently protrudes into the river channel and, once the abutment is removed, the fill associated with the old abutment would be graded back to increase hydraulic capacity and alleviate potential downstream erosion. Existing rip rap would be set back in place and tied in with the existing slopes to ensure that the protection measures of the abutment area are not compromised and do not increase the risk to existing infrastructure upstream and downstream of the site. The restored abutment areas would be revegetated with willow cuttings to improve slope stability and riparian habitat.

Project Background

Replacing Maclay Bridge has long been a priority of Missoula County dating back as far as 1994, when an Environmental Assessment (EA) for the *Maclay Bridge Site Selection*

Study was developed (Carter & Burgess 1994). The Preferred Alternative identified in the environmental document was a new bridge located at the end of South Avenue. A Finding of No Significant Impact (FONSI) on the 1994 EA was never issued by FHWA, and, at the request of Missoula County, the project identified within the EA was not advanced. Special project demonstration funds were initially intended to be used to fund the project; however, Missoula County was not able to obtain the funding. In 2002, Missoula County nominated the bridge replacement project to receive funding from MDT's Off-System Bridge Program.

Instead of immediately entering into the project development phase and environmental documentation, Missoula County decided to delay the project and, with assistance from MDT, conduct a pre-National Environmental Policy Act (NEPA)/Montana Environmental Policy Act (MEPA) planning study. The purpose of the planning study was to document existing and projected conditions, take a fresh look at and evaluate a range of alternatives, and conduct additional outreach with the public and resource agencies. In 2013, the *Maclay Bridge Planning Study* (Robert Peccia & Associates 2013) identified the South 1 Alignment (3E.1) as the preferred alignment. The South 1 Alignment (3E.1), similar to the 1994 EA Preferred Alternative, includes extending the westernmost limits of South Avenue with a new bridge crossing the Bitterroot River and connecting to River Pines Road on the west side of the river. This alignment was determined best able to increase safety and efficiency for the traveling public based on multiple criteria relating to safety, geometric and environmental concerns.

On April 17, 2013, the Missoula County Commissioners unanimously voted in favor of accepting the 2013 planning study recommendation and moving forward with the plan to replace the existing Maclay Bridge with a new bridge on South Avenue.

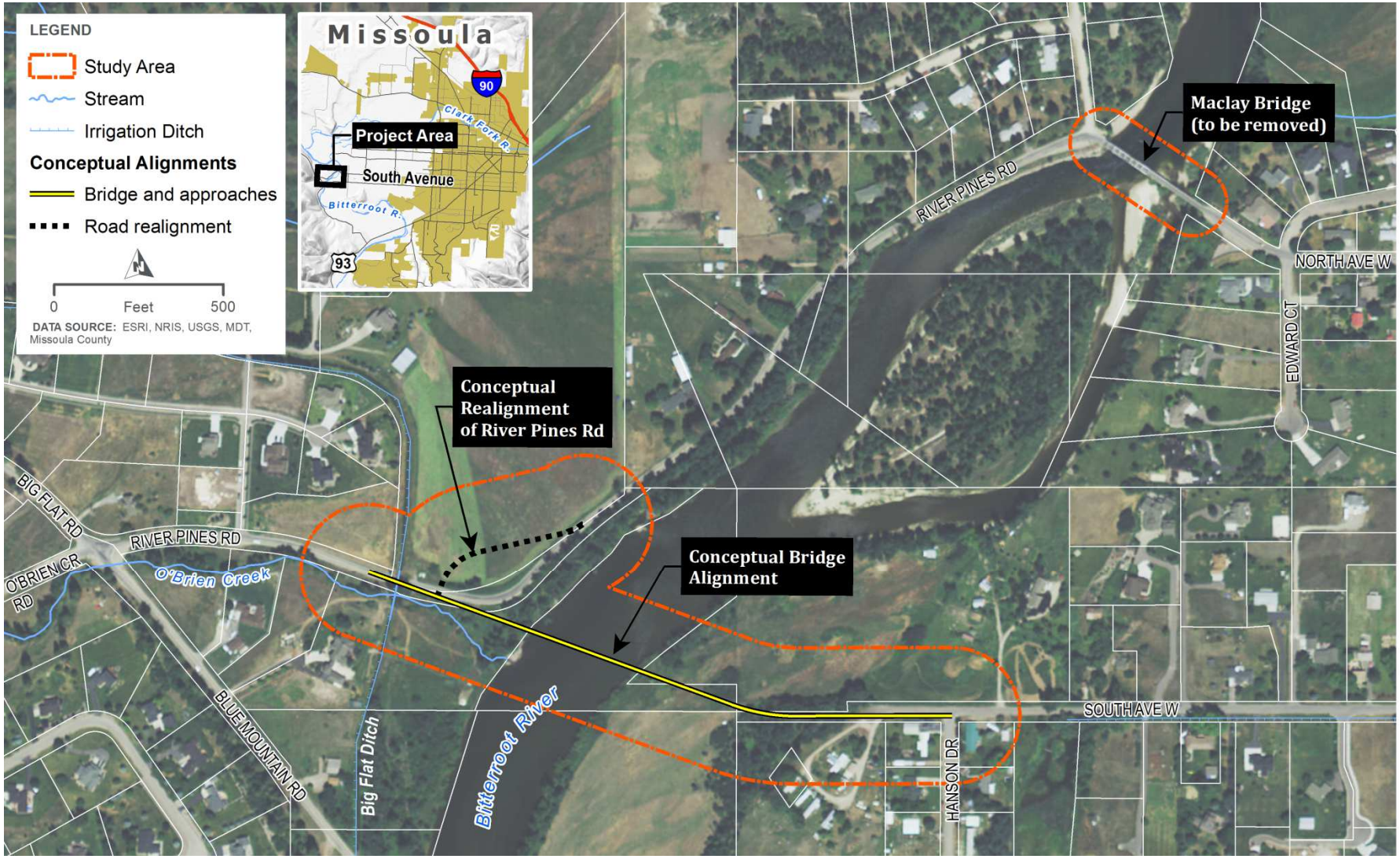

Figure 1-1. Study Area

1.2 Ecological Setting and General Area Description

Ecoregion

The study area is located within Bitterroot River floodplain within the Middle Rockies level 3 ecoregion and the Bitterroot-Frenchtown Valley level 4 ecoregion (Woods et al. 2002, USEPA 2012). The following description is summarized from Woods et al. (2002) and USDA NRCS (2015a). The Bitterroot-Frenchtown Valley is an intermontane valley with floodplains, terraces, hills, and fans, with thick alluvial, colluvial, outwash and till soils formed out of end moraines of alpine glaciers. Climate in the Bitterroot-Frenchtown Valley is characterized by precipitation that averages 12 to 24 inches per year, which mainly occurs in fall, winter and spring, and with much of the precipitation in the winter falling as snow. Wintertime temperatures typically fall below freezing, and summertime temperatures peak in the high 80's. Snowmelt from surrounding mountains contributes to high stream flows in the spring. In the vicinity of the project, the Bitterroot River floodplain has seen moderate development. Residential and agricultural land uses abut the Bitterroot River and existing blocks of hardwood and coniferous riparian forest within the project vicinity are relatively small and non-contiguous.

The study area intersects with the boundaries of multiple Hydrologic Units. The study area is situated within the fifth-level Bitterroot River-Miller Creek watershed (south portion of study area) Hydrologic Unit Code (HUC) 1701020516 and the Clark Fork River-Rattlesnake Creek watershed (north portion of study area) HUC 1701020401. More specifically, three sixth-level subwatersheds converge at the location of the study area and include: Bitterroot River-Hayes Creek (HUC 170102051603); Clark Fork River-Marshall Creek (HUC 170102040104); and O'Brien Creek (HUC 170102051602) (USGS 2014).

Landcover

The Montana Natural Heritage Program Landcover database (MNHP 2016a) was reviewed to provide general landcover types located near the study area. Landcover types are grouped into general ecological systems that represent groups of biological communities that are found in similar physical environments and are influenced by similar ecological processes. Table 1-1 details landcover types within the immediate study area.

Table 1-1. Landcover Types within Study area

Ecological System/Land Use	Landcover Class	Percent (%) Total of Study Area[a]
Other Roads	Human Land Use	18.97
Open Water	Open Water / Wetland and Riparian Systems	17.86
Pasture/Hay	Human Land Use	16.00
Developed, Open Space	Human Land Use	13.11
Low Intensity Residential	Human Land Use	9.40
High Intensity Residential	Human Land Use	8.98
Alpine-Montane Wet Meadow	Open Water / Wetland and Riparian Systems	6.86
Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland	Open Water / Wetland and Riparian Systems	6.51
Cultivated Crops	Human Land Use	2.24
Rocky Mountain Lower Montane, Foothill, and Valley Grassland	Grassland Systems	0.07
	Total	100

Source: MNHP 2016
[a] Study area is approximately 21.2 acres in size.
Note: Landcover data is available at a 30m resolution. Limitations exist based on the scale of analysis.

As evidenced by the landcover class column in Table 1-1, human land uses dominate the existing landcover classes, comprising 68.7% of the immediate study area. Open water/wetland and riparian systems comprise approximately 31.2% of the study area, and includes the Bitterroot River.

Land Use and Land Ownership

The study area is situated at the western edge and outside of Missoula's city limits and is considered a part of Missoula's Target Range neighborhood. The predominant land use within the project vicinity is residential with developed parcels ranging in size from one-half acre and larger. Low- to medium-density residential development exists on both the east and west sides of the river. A small, approximately 4-unit mobile home park is located at the western terminus of South Avenue. The project vicinity includes open space primarily within the Bitterroot River floodplain. This includes an approximately 8.5-acre undeveloped island located between the proposed bridge location and the existing Maclay Bridge, which contains a 1.0-acre conservation park identified as Dinsmore River Four Park owned by Missoula County (Missoula County 2016). Agricultural uses consisting of mostly hay production also exist within the study area on the west side of the river (MSL 2016).

Land ownership within the immediate vicinity of the study area is predominantly privately owned. Missoula County owns the ROW that includes South Avenue, which tapers in width west of the cul-de-sac and beyond the paved roadway. Per Montana Code

Annotated (MCA 70-16-201) the State of Montana owns the riverbed of the Bitterroot River (and all other navigable rivers) from low water mark to low water mark.

2 Terrestrial Resources

2.1 General Habitat and Vegetation Communities

Methods

Information reported within this section was obtained from a combination of literature and database searches and on-site field investigation. Existing documentation reviewed for this section includes the following:

- Montana Natural Heritage Program (MNHP 2015) GIS Database
- MNHP (2016a) land cover atlas maps

HDR environmental staff conducted field investigations on October 6 and 8, 2015. General species occurrence and vegetative cover in the study area accessible via legal rights-of-way as well as 200 feet upstream and downstream of the proposed bridge alignment were documented during this site visit. In addition, an area approximately 100 feet upstream and downstream of the existing Maclay Bridge was investigated.

Species Presence and Distribution

The surveyed terrestrial portion of the study area includes the road ROW along South Avenue between Hanson Drive and the South Avenue cul-de-sac and River Pines Road where the conceptual bridge alignment intersects the roadway at the curve. The agricultural field immediately to the north of the bend that includes the conceptual realignment of River Pines Road was also investigated. The existing ROW within the study area has been disturbed by past highway construction activities and ongoing maintenance. Vegetation consists of grasses and forbs that appear to be periodically mowed within the ROW.

Common roadside species observed at the east end of the study area along South Avenue include field brome (*Bromus arvensis),* Idaho fescue (*Festuca idahoensis*), field mustard (*Brassica rapa*), spotted knapweed (*Centaurea maculosa*), Canada thistle (*Cirsium arvense*), common mullein (*Verbascum thapsus*), catnip (*Nepeta cataria*), and burdock (*Arctium minus*). Common roadside species observed at the west end of the study area along River Pines Road include field brome*,* field mustard, common tansy (*Tanacetum vulgare*), common snowberry (*Symphoricarpos albus*), and Wood's rose (*Rosa woodsii*).

Due west of the South Avenue cul-de-sac is a mature stand of deciduous trees consisting primarily of quaking aspen (*Populus tremuloides*) averaging approximately 40 to 50 feet in height, with intermixed balsam poplar (*Populus balsamifera*). Understory vegetation observed included Wood's rose, burdock, weeping willow (*Salix alba*), and field brome. The tree stand is approximately 2 acres in size and extends to the south outside of the project limits.

Riparian vegetation along the Bitterroot River in the general location of the proposed alignment is comprised of a narrow band of second-growth to mature black cottonwood (*Populus trichocarpa*), balsam poplar, weeping willow, and redosier dogwood (*Cornus sericea*). Located below the ordinary high water mark (OHWM) are margins of wetland vegetation consisting primarily of sedge (*Carex vesicaria*) and common spike-rush (*Eleocharis palustris*). Wetland vegetation is discussed in more detail in Section 3.3.

Riparian vegetation in the vicinity of Maclay Bridge is mostly limited to the right (east) bank of the Bitterroot River, and consists of young black cottonwood trees, willows, redosier dogwood, Wood's rose, and snowberry. There are only scattered grasses and forbs along the left bank near Maclay Bridge.

Noxious weeds detected in the study area are discussed in Section 2.2.

Potential Impacts

It is estimated that the proposed project would clear approximately 2.8 acres of grasses, weeds and forbs within the existing ROW and adjacent fields on the east and west sides of the river and approximately 1.0 acre of shrub and forested area, 0.3 acre of which is riparian vegetation on the right and left banks immediately adjacent to the Bitterroot River. Existing riparian vegetation within the study area near the new bridge site is limited to narrow margins along the river and has been substantially altered and cleared for agriculture, roads and residential development. Permanent removal of native vegetation would be limited to the extent practicable to construct the project. Areas disturbed during construction will be restored with suitable riparian species following construction. In addition, areas adjacent to O'Brien Creek would be restored where River Pines Road will be obliterated. This would increase the area and buffer width of riparian vegetation over existing conditions between O'Brien Creek and the west roadway approach to the bridge.

Although precise bridge removal methods have not yet been developed, temporary impacts on riparian vegetation at the existing Maclay Bridge site would likely occur during removal of the bridge and bridge piers and abutments. Minor vegetation clearing would likely be required at the east abutment area to provide equipment access to piers. Once Maclay Bridge was removed, including the abutments, the disturbed areas would be restored through planting of riparian species. The restoration efforts will be conducted in coordination with FWP, MDT, and Missoula County. Due to minimization of the project footprint and restoration and enhancement of riparian areas, the proposed project is not anticipated to have a long-term negative impact to overall riparian habitat along the Bitterroot River.

Avoidance and Minimization Recommendations

The following measures are proposed to minimize project impacts on terrestrial resources:

- Temporary clearing outside the construction limits but within the ROW of the new bridge would be minimized and restored as soon as practicable following construction.

- Tree and large shrub removal would be minimized to the greatest extent practical.
- Temporarily impacted riparian habitat should be replanted with appropriate vegetation following construction as soon as practical after disturbance.

2.2 Noxious Weeds/Regulated Plants

Methods

Information reported within this section was obtained from a combination of literature and database searches and on-site field investigation. The following documents and databases pertaining to noxious weeds were reviewed:

- Missoula County Weed District (2016) Noxious Weeds List
- Montana Department of Agriculture (2015) Noxious Weed List

HDR staff qualitatively documented noxious weed occurrence within the study area during the October 2015 site visits.

Executive Order (E.O.) 13112 (established February 3, 1999) was established to prevent the introduction of invasive species and to control and minimize the economic, ecological, and human health impacts caused by invasive species. As a partially federally-funded action, the proposed project is subject to the provisions of EO 13112.

Species Presence and Distribution

Minor distributions of weeds were observed along the roadsides with the existing ROW of South Avenue and River Pines Road. The study area falls within the Missoula County Weed District's Blue Mountain-Target Range Weed Management Area (WMA). Table 2-1 lists the weeds documented within the WMA and includes priority status, commonality within the WMA and whether or not the weed was observed within the study area during the field investigation.

Table 2-1. Weeds Found Within the Blue Mountain-Target Range Weed Management Area (WMA)

Common Name	Scientific Name	Priority Status[a]	Distribution throughout WMA	Observed within Study Area?
Canada thistle	*Cirsium arvense*	2B	Widespread	**Yes**
Common Tansy	*Tanacetum vulgare*	2B	Widespread	**Yes**
Houndstongue	*Cynoglossum officinale*	2B	Widespread	No
Field bindweed	*Convolvulus arvensis*	2B	Widespread	No
Leafy spurge	*Euphorbia esula*	2B	Widespread	No
Spotted knapweed	*Centaurea stoebe (syn. maculosa)*	2B	Widespread	**Yes**
Sulfur cinquefoil	*Potentilla recta*	2B	Widespread	No
Tall buttercup	*Ranunculus acris*	2A	Widespread	No

Common Name	Scientific Name	Priority Status[a]	Distribution throughout WMA	Observed within Study Area?
Dalmatian toadflax	*Linaria dalmatica*	2B	Established	No
Japanese knotweed	*Polygonum cuspidatum*	1B	Established	No
Orange Hawkweed	*Hieracium aurantiacum*	2A	Established	No
Oxeye daisy	*Leucanthemum vulgare*	2B	Established	No
St. Johnswort	*Hypericum perforatum*	2B	Established	No
Whitetop	*Cardaria draba*	2B	Established	No
Yellow toadflax	*Linaria vulgaris*	2B	Established	No
Tamarisk	*Tamaris ramosissima*	2B	Rare	No
Yellow flag iris	*Iris pseudacorus*	2A	Rare	No

Sources: Missoula County Weed District, 2016; Montana Department of Agriculture, 2015; Lichvar, R.W. et. al. 2016
[a] See Appendix D for Montana Noxious Weed List and Priority Status definitions

Priority 1B species are weeds that have limited presence in Montana and management of these species includes local prioritization, eradication or containment and education. Priority 2A species include weeds that are common in isolated areas of Montana and management requires eradication or containment where less abundant. Priority 2B species are weeds that, from a statewide management perspective, are abundant in Montana and widespread in many counties. Although dispersed throughout the study area in small groupings, large infestations of noxious weeds were not observed.

Avoidance and Minimization Recommendations

The following conservation measures are proposed to prevent and to minimize spread of noxious weeds.

- In accordance with 7-22-2152 MCA, MDT will re-establish a permanent desirable vegetation community along areas disturbed by construction.
- A set of seeding/weed control special provisions will be developed by MDT, which include requirements for all construction equipment and vehicles to be cleaned prior to their transport to the project site.

2.3 General Wildlife Species

Methods

Information reported within this section was obtained from a combination of literature and database searches, agency consultation, and on-site field investigation. HDR staff recorded any detection of wildlife (mammals, birds, reptiles, and amphibians) or wildlife sign (e.g., tracks, scat) in the project vicinity during the October 2015 site visits. Given the limitations of two days of field observation data, the MNHP (2016b, 2015) Natural Heritage Map Viewer application was used to query the general animal observation database by Township, Range, and Section (4 sections in total) to provide a more thorough list of mammal, bird, and reptile and amphibian species that have previously

been observed within the project vicinity. The potential for animals to occur in the project vicinity was further screened based on geographic location comments documented in the MNHP database, suitable habitat in the project vicinity, and observation dates no greater than 50 years old.

Preliminary resource information was obtained from FWP and USFWS during initial project scoping. HDR also consulted with biologists from MNHP regarding fish and wildlife resources in the study area. Additionally, on August 18, 2016, a preliminary resource agency meeting was conducted to discuss the proposed project and obtain pertinent information from federal, state, and local agencies present. Refer to Appendix B for more information.

2.3.1 Mammals

Species observed/documented, general abundance, distribution, and habitat requirements

White-tailed deer (*Odocoileus virginianus*), red squirrel (*Tamiasciurus hudsonicus*), an unidentifed rodent, and black bear (*Ursus americanus*) scat were directly observed in the vicinity of the proposed bridge during the site visit. A northern river otter (*Lontra canadensis*) was observed in the vicinity of Maclay Bridge.

Other mammal species known to be present in the area as documented by MNHP include beaver (*Castor canadensis*), big brown bat (*Eptesicus fuscus*), Columbian ground squirrel (*Urocitellus columbianus*), deer mouse (*Peromyscus maniculatus*), house mouse (*Mus musculus*), long-eared myotis (*Myotis evotis*), meadow vole (*Microtus pennsylvanicus*), montane vole (*Microtus montanus*), muskrat (*Ondatra zibethicus*), red-tailed chipmunk (*Tamias ruficaudus*), silver-haired bat (*Lasionycteris noctivagans*) and striped skunk (*Mephitis mephitis*). These species have the potential to occur in the project vicinity because surrounding lands are comprised of moderately intact riparian and floodplain habitat that provide opportunity for wildlife movement, and connectivity between different habitat types that support different life cycle requirements of mammals. Although the Bitterroot River riparian corridor provides connectivity through the study area, existing roadway and residential development within the study area vicinity currently limits mobility landward of the corridor and potentially discourages wildlife movement.

Potential Impacts

Impacts on mammal populations as a result of the proposed project are anticipated to be negligible. Direct, permanent impacts on existing native forested areas that is most valuable to mammals, including riparian vegetation along the Bitterroot River, would be limited to a small area (approximately 1 acre) primarily located on the east bank of the Bitterroot River. Direct impacts on existing vegetation and wildlife habitat in the study area are considered minor given the relatively small areas of anticipated disturbance in relation to ample availability of suitable habitat (adjacent open space and Lolo National Forest) within the project vicinity and proposed revegetation of disturbed areas at the new bridge location and Maclay Bridge. Potential impacts to bats are discussed in Section 4.2.

Construction of the project could result in direct mortality of individual animals. This is likely limited to species with limited mobility such as rodents and herptiles; animals with greater mobility would be able to move to suitable adjacent habitat along the riparian corridor. Wildlife mobility along the banks of the Bitterroot River may be temporarily affected during construction of the new bridge and removal of Maclay Bridge; however, obstructions would be temporary and limited to only the length of time required to complete the proposed project. An increase in noise levels during construction may temporarily disrupt mammals in the vicinity of the proposed project. Noise effects would be temporary and localized, and would occur only during daylight working hours.

Newly constructed permanent ROW fence may introduce new obstructions that inhibit the movement of juvenile wildlife (e.g., young-of-the-year white-tailed deer). The area of new alignment construction will result in new disturbance and fragment the parcel on which it is constructed, primarily on the east side of the river; however, it is probable that wildlife would adapt by using the areas underneath both bridge abutments for passage. Completion of the proposed project would not result in a loss in connectivity of riparian habitat along the Bitterroot River as mammals are still expected to traverse under the new bridge spans and abutments. Completion of the proposed project could increase the potential for animal-vehicle collisions, with white-tailed deer being the most abundant and probable species to consider. This phenomenon would likely be most applicable at the eastern edge of the project area along South Avenue where traffic volume increases would be greatest. Bicycle and pedestrian use of the bridge is unlikely to result in mammal mortality.

Wildlife Mitigation Needs, Feasibility, Recommendations

Not applicable; no adverse impacts on mammal populations are anticipated as a result of the proposed project.

Avoidance and Minimization Recommendations

- Missoula County and MDT ROW personnel are encouraged to negotiate for the use of wildlife friendly ROW fences with the adjoining landowners.

2.3.2 Birds

Species observed/documented, general abundance, distribution, and habitat requirements

Belted kingfishers (*Megaceryle alcyon*), killdeer (*Charadrius vociferous*), and a sharp-shinned hawk (*Accipiter striatus*) were observed near the proposed bridge alignment during the October field surveys. HDR staff also observed an osprey (*Pandion haliaetus*) nest near the west side of proposed bridge alignment, near Big Flat Ditch; no nesting activity was detected. American tree sparrows (*Spizelloides arborea*) and cliff swallows (*Petrochelidon pyrrhonat*a) were observed flying in the vicinity of the Maclay Bridge during the field survey. No cliff swallow nests were observed underneath the Maclay Bridge at either bridge abutment; however, the underside of the bridge span over the active river channel was inaccessible and not entirely visible during the field survey and may contain nests.

The MNHP (2016b) includes observations for 210 bird species documented over the past 50 years. An exhaustive list of possible species occurring within the study area is not presented here. However, species commonly observed within the study area vicinity include red-breasted nuthatch (*Sitta canadensis*), black-capped chickadee (*Poecile atricapillus*), house finch (*Haemorhous mexicanus*), bald eagle (*Haliaeetus leucocephalus*), black-billed magpie (*Pica hudsonia*), pine siskin (*Spinus pinus*), downy woodpecker (*Picoides pubescens*), and house sparrow (*Passer domesticus*). As evident from the large number of bird species observations, the study area is likely to be occupied by a variety of species adapted to western Montana riparian and riverine habitats as well as urban landscapes.

Potential Impacts

The proposed project is not anticipated to result in long-term negative impacts on birds or active nests. The anticipated construction disturbance to bird habitat is limited to approximately 1 acre of second growth to mature shrub and forested areas. Much of the native habitat within the study area has previously been disturbed by agriculture, roads and residential development. Impacts on vegetation that may provide nesting, perching, and foraging habitat are expected to be minor. Special provisions will be included as conservation measures to minimize impact on migratory birds by ensuring that tree and shrub removal occurs outside of the nesting period and that Maclay Bridge is also removed outside the nesting period or nesting deterrents are installed prior to the nesting period. Construction-related noise may temporarily disrupt birds in the vicinity of the proposed new bridge and Maclay Bridge during construction activity. Noise effects would be temporary and localized, and would occur only during daylight working hours.

Avoidance and Minimization Recommendations

The following conservation measures are proposed to minimize project impacts on bird species and habitat.

- Specific to activities involving the demolition of the existing Maclay Bridge, special provision 107-25a, Migratory Bird Treaty Act Compliance – Structures (Revised 2-18-16) will be included in the final construction bid documents to avoid and minimize potential impacts on migratory birds resulting from structure removal or work that may directly impact active nests.
- Special Provision number 107-25c, Migratory Bird Treaty Act Compliance – Vegetation Removal (Added 9-26-13), will be included in the final construction bid documents to avoid and minimize potential impacts on migratory birds resulting from vegetation removal. This special provision includes the following construction requirements:
    - Perform any required cutting of trees or shrubs between August 16 and April 15;
    - Remove only those trees and shrubs in direct conflict with the permanent construction limits; and
    - Where possible, do not remove, but trim trees and shrubs as necessary for equipment access and construction activities.

- A special provision shall be developed instructing the contractor to coordinate with FWP (Kristi DuBois, wildlife biologist) prior to initiating construction to identify construction constraints relative to known osprey nest locations.
- The following options are available to accommodate ospreys under the MBTA:
  - Avoid construction activities when eggs or young are in the nest (April 15 to August 31); or,
  - Remove the nest when it is not occupied by eggs or young (September 1 to April 14). However, once removed, the nest cannot be reduced to possession; or,
  - The responsible agency (Missoula County or MDT) can apply for a permit from the USFWS's Migratory Birds Office in Denver, CO to relocate nests to an alternate location.

2.3.3 Reptiles and Amphibians

Species observed/documented, general abundance, distribution, and habitat requirements

Reptiles documented to occur in the project vicinity by MNHP include the gophersnake (*Pituophis catenifer*), northern rubber boa (*Charina bottae*), terrestrial gartersnake (*Thamnophis elegans*), and western skink (*Plestiodon skiltonianus*). Amphibians documented to occur in the project vicinity by MNHP include the Columbia spotted frog (*Rana luteiventris*), long-toed salamander (*Ambystoma macrodactylum*), Rocky Mountain tailed frog (*Ascaphus montanus*), and western toad (*Anaxyrus boreas*). These species likely occupy intact riparian forests in the project vicinity; although the gophersnake generally prefers drier pine forests (MNHP 2015). No reptiles or amphibians were observed during the October 2015 field surveys.

Potential Impacts

The quality and availability of suitable reptile and amphibian habitat is limited within the study area and the proposed project is not anticipated to result in substantial impacts on amphibians and reptiles. The anticipated construction disturbance areas are mainly limited to areas previously disturbed by agriculture, roads and residential development.

Avoidance and Minimization Recommendations

No additional avoidance and minimization measures are recommended at this time.

3 Aquatic Resources

3.1 Waterways

Methods

Information reported within this section was obtained from a combination of literature and database searches and on-site field investigation. Existing documentation reviewed for this section includes the following:

- Montana Natural Heritage Program (MNHP 2015) Database
- Northwest Power and Conservation Council. Bitterroot River Subbasin Plan (NPCC 2009)
- Montana Fish, Wildlife and Parks Montana Fisheries Information System (MFISH) (FWP 2016)

HDR staff qualitatively documented instream habitat of the Bitterroot River approximately 150 feet upstream and downstream of the approximate bridge alignment and approximately 100 feet upstream and downstream of the existing Maclay Bridge in October 2015.

The OHWM of the Bitterroot River was delineated using sub-meter accuracy GPS during the field investigation. Following US Army Corps of Engineers (USACE) (2005) guidance, the OHWM was based on observation of physical characteristics on the shore of the river within the study area vicinity to ascertain the lateral limits of USACE jurisdiction. The physical characteristics used in identifying the OHWM included identifiers such as presence of litter and debris, wracking, scour, changes in character of soil, changes in plant community, among others. Observation points were taken with a GPS and correlated to the topographic survey to identify OHWM within the study area. General observations of stream morphology, substrate, instream habitat features such as large woody debris, and general streambank and riparian conditions were also noted during the field investigation.

Site Description/Stream Morphology

The proposed project lies in the Bitterroot Subbasin, which has an area of 2,889 square miles and is located entirely in Ravalli and Missoula Counties in the Rocky Mountains of western Montana (NPCC 2009). The Bitterroot Mountains along the Idaho border form much of the southern and western boundary, while the crest of the Sapphire Mountains forms the eastern boundary. The Bitterroot River, which flows through the center of the subbasin, is a tributary to the Clark Fork of the Columbia River (Clark Fork River) in western Montana. Its principal tributaries include the East Fork of the Bitterroot River, the West Fork of the Bitterroot River, Burnt Fork Creek, and Lolo Creek. From the confluence of the East Fork and West Fork just south of Darby, Montana, the Bitterroot River flows northward 84 river miles to its confluence with the Clark Fork River near Missoula, Montana.

The Bitterroot River is the dominant waterbody located within the study area. Other water bodies located within the study area include O'Brien Creek, a left (west) bank tributary to Bitterroot River and the Big Flat Ditch, which flows perpendicular to and underneath both O'Brien Creek and River Pines Road.

Bitterroot River

The proposed bridge crossing site is located at approximately river mile 1.8 of the Bitterroot River, or 1.8 miles upstream from its confluence with the Clark Fork River. Based on the OHWM delineation, it is recommended that the elevation of 3,108 feet should be used throughout the project reach at the proposed bridge location as the jurisdictional OHWM of the Bitterroot River. Refer to Section 3.3 for the wetlands and waterbody map depicting OHWM. At the proposed bridge alignment, the Bitterroot River

is a single channel approximately 320 feet wide. The cross sectional river channel is relatively flat, lacking a defined thalweg, and maintains a consistent low channel bottom elevation of approximately 3,102 feet across much of its width. Because of this, at low water flows, the channel within the study area lacks any exposed gravel bars. The river in this reach is shallow and was less than 2 feet in depth during the field visit in October 2015, with a large riffle area on the downstream side of the proposed bridge site.

Stream habitat in the Bitterroot River within the project reach is comprised primarily of glide habitat, with riffle areas downstream of the proposed bridge site. Approximately 700 feet downstream from the proposed bridge the river channel splits around an approximately 8.5-acre forested island and converges back to a single channel downstream of the existing Maclay Bridge. A small pool is present at the confluence with O'Brien Creek, which enters into the left bank of the Bitterroot River approximately 120 feet upstream of the proposed bridge.

At the existing Maclay Bridge, the main channel of the Bitterroot River constricts to approximately 165 feet wide where it flows under the main span of the bridge, with a small side channel along the east bank at the downstream end of the island (Figure 1-1). The river at this location increases in depth (scour pool) with a surveyed thalweg elevation of 3,085 feet. Two smaller vegetated gravel bars also form a small backwatered side channel along the right bank at the downstream end of the large island and under Maclay Bridge. The river channel throughout the eastern half of the bridge is at higher elevation than the main channel and flows can become discontinuous during low flow conditions. Additionally, large cobble beach areas are exposed in the vicinity of Maclay Bridge during low flows. Downstream of Maclay Bridge, the river resumes as a single channel approximately 280 feet wide.

O'Brien Creek

The lower reach of O'Brien Creek flows eastward and discharges into the Bitterroot River on the left bank just upstream from the proposed bridge alignment. Approximately 720 linear feet of O'Brien Creek falls within the study area and parallels River Pines Road. Because it is surrounded by private property, access to O'Brien Creek within the study area was limited to only the mouth area via low water access along the Bitterroot River. The O'Brien Creek stream centerline within the study area was digitized using LiDAR topographical information and high-resolution imagery. In general, the width of the creek within the study area is approximately 10 feet wide. Past restoration work has occurred within the O'Brien Creek watershed. Between 1997 and 2000, the USFS decommissioned old logging roads within the upper watershed, in part, to improve water quality within O'Brien Creek (Glaser 2000). From 1998 to 2000, FWP conducted restoration in the lower portions of O'Brien Creek from Blue Mountain Road downstream to the confluence with the Bitterroot River to improve trout spawning habitat, increase fish passage, and restore natural hydrological function.

Big Flat Ditch

Big Flat Ditch is an historic irrigation ditch that diverts water from the north bank of the Bitterroot River approximately five river miles upstream of the proposed bridge site and flows northward approximately nine miles to near the confluence of the Bitterroot and Clark Fork rivers. A portion of the Big Flat Ditch flows south to north through the study area approximately 250 feet west of the Bitterroot River. It crosses underneath O'Brien

Creek and River Pines Road via a siphon culvert. The ditch within the study area is between six and eight feet wide and approximately six feet deep. Approximately 290 feet of the ditch is open and unlined and approximately 120 feet flows through a culvert.

Total Maximum Daily Load Listing 303(d)

The reach of the Bitterroot River in the project vicinity (Eightmile Creek to Clark Fork River mouth; Assessment Unit MT76H001_030) is on the State's 303(d) list of impaired waters (DEQ 2016). This water body is a Category 4A, defined as waters where all total maximum daily loads[1] (TMDLs) required to rectify all identified threats or impairments have been completed and approved. 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. Lead (source unknown), elevated instream temperature, and alteration in stream-side or littoral vegetative covers are the causes of impairment to this reach. Wet weather discharges (both point and non-point source), agriculture, and rangeland grazing in the contributing basin are the probable sources of impairment. A TMDL has been completed for lead and temperature on this reach of the Bitterroot River (DEQ 2016).

Potential Impacts

Construction Impacts

The project as currently proposed includes a four-span welded plate girder bridge design approximately 746 feet long that will require two instream piers within the Bitterroot River channel. Installation of the two intermediate bridge piers will result in permanent impacts to the riverbed of the Bitterroot River. Rip rap would not be necessary in the Bitterroot River surrounding the piers because the piers would be designed for the anticipated scour. Due to the setback of the abutments from the river, protective rip rap at the abutments would be outside the river channel. The west bridge abutment is located in close proximity to the river and rip rap placed around this abutment would have minor impact on the river bank, but no impact below OHWM. No permanent impact to the bed or bank of the Bitterroot River is anticipated at the east bridge abutment because it is located well outside of river channel. Precise construction limits are not presently defined; however, the total area of impact on the Bitterroot River below OHWM is anticipated to be minor and substantially less than 0.5 acre.

The proposed project is not anticipated to impact flooding conditions because the proposed bridge will be sited at an elevation to pass the 100-year flow event and bridge piers aligned to the flow direction. Because of this, the proposed project is not expected to substantially affect stream channel morphology at the South Avenue Bridge site.

The proposed alignment would not directly impact O'Brien Creek. Following FWP recommendation, the proposed bridge alignment has been located to include an

[1] A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

approximate 100 foot buffer between the O'Brien Creek confluence and the proposed bridge alignment. Inclusion of the buffer serves to minimize potential water quality impacts due to roadway proximity as well as discourage recreation access and increased angling pressure on fish that congregate at the mouth of the O'Brien Creek due to its cooler waters.

Due to the alignment shift to the north, a section of River Pines Road between O'Brien Creek and the west roadway approach to the bridge would be obliterated. It is anticipated that most of the existing roadway fill prism would be removed and restored as additional riparian buffer. Effects to the O'Brien Creek floodplain as a result of the reconfiguration of River Pines Road are currently being evaluated. Standard BMPs will be implemented to minimize construction impacts on O'Brien Creek.

A minor impact on Big Flat Ditch would occur where a portion of the existing ditch would be modified and the existing culvert extended to the north to accommodate the reconfiguration of River Pines Road. The ditch alignment would not be modified and the culvert would be designed and sized per hydraulic recommendation.

Removal of the existing Maclay Bridge, including bridge piers and abutments, will permanently alter the stream morphology at this location by removing the current channel restriction caused by the bridge and restoring a normal cross-sectional width for this reach. It is anticipated that the west abutment fill area extending into the river channel will be graded back to increase hydraulic capacity. Once abutments are removed, existing rip rap would be put back in place and restored by incorporating soil and planting willow cuttings above the OHWM.

Restoration through planting of riparian species would occur where practicable in disturbed areas adjacent the Bitterroot River and O'Brien Creek following construction of the South Avenue Bridge and removal of the Maclay Bridge.

Short-term impacts on aquatic resources are anticipated due to construction-related activities and direct disturbance to the Bitterroot River. Temporary increases in turbidity and suspended sediments may occur during construction. Installation of coffer dams and work trestles in the river channel are anticipated for construction of the piers and removal of the existing piers at Maclay Bridge. Designs have not been finalized at this time and there is also the potential that the project could use drilled shaft piers, which is likely to generate notably less sediment than other conventional pier construction methods due to the full containment of the drilling inside the casing. Dewatered areas including coffer dams or the pier casings, once in place, would be dewatered in accordance with the applicable state and federal regulations.

Operational Impacts

Impacts due to operation of the new bridge would generally be negligible. Stormwater would be conveyed off the bridge (i.e., away from the river) and dispensed onto adjacent upland areas at either bridge end. This would substantially minimize potential for roadway pollutants, including winter de-icing chemicals from entering the river. If a stormwater detention facility is required on the west side of Bitterroot River, stormwater discharge may indirectly affect O'Brien Creek and Big Flat Ditch. Stormwater facilities, if required, would be located as far away from O'Brien Creek as is practicable. Consideration should be made to minimize impacts or return flow potential through buffers and/or appropriate sloping of the stormwater facility.

Avoidance and Minimization Recommendations

Water quality impacts would be minimized through compliance with the various state and federal water quality regulations that are anticipated for the proposed project (see following section), including any permit special conditions, as well as other conservation measures described in subsequent sections of this report. Section 107.11.2 (Environmental Protection, Water Pollution Control Requirements) and Section 208 (Water Pollution Control and Aquatic Resource Preservation) of the *MDT Standard Specifications for Road and Bridge Construction* (MDT 2014) specify the processes with which the contractor must comply to prevent or minimize pollution and control impacts on aquatic resources.

Water quality impacts would be substantially avoided and minimized by the use of standard best management practices (BMPs) that include erosion and sediment control(s), as necessary, to minimize temporary impacts on adjacent properties and abate pollution of surface and ground water resources. The contractor would be responsible for conducting routine site monitoring to ensure all pollution control measures are installed, maintained, and functioning correctly.

Per USFWS and FWP recommendation, a no-disturbance riparian buffer shall be delineated with visible markers along the north edge of O'Brien Creek through the project area to protect the stream corridor during project implementation. Where possible, this buffer shall be a minimum of 50 feet. An exception is where the current road shoulder lies within 50 feet of the stream. In this case, no existing woody vegetation along the stream shall be disturbed and the buffer shall be expanded once the existing road prism is removed and relocated. Additional BMPs anticipated for the proposed project are described in Section 3.2 below.

Permitting Required

The proposed project is anticipated to require the following permits and authorizations for work within the OHWM and within the 100-year floodplain of the Bitterroot River:

- Section 404 Permit of the Clean Water Act – U.S. Army Corps of Engineers
- Section 401 Water Quality Certification of the Clean Water Act – Montana DEQ
- Montana Pollutant Discharge Elimination System (MPDES) General Permit – Montana DEQ
- Short-Term Water Quality Standard for Turbidity (318 Authorization) – Montana DEQ
- Montana Stream Protection Act (SPA 124 Authorization) – Montana Fish, Wildlife & Parks
- Navigable Rivers Land Use License/Easement – Montana DNRC
- Floodplain Development Permit – Missoula County
- MS4 Permit – City of Missoula

Additional permits may be required depending on contractor methods and use of temporary structures within the river.

Stream Mitigation Requirements

The project as currently proposed would impact less than 300 linear feet of stream channel on the Bitterroot River. Construction of the new bridge would not require permanent fill along the riverbank below OHWM and the removal of Maclay Bridge and its associated piers, piles and abutments will result in the removal of fill within the Bitterroot River. The project has been designed to avoid direct impacts to O'Brien Creek. The Montana Stream Mitigation Procedure (USACE 2013) states:

> "Projects impacting less than 300 linear feet will require compensatory mitigation on a case-by-case basis. Areas upstream and downstream from the proposed project will be evaluated, regardless of property ownership or control, to determine if the cumulative impact of past actions and the proposed project warrants compensatory mitigation for projects impacting less than 300 linear feet of stream channel."

Appropriate stream mitigation, if required, will be determined through coordination with USACE and MDT when stream impacts are further quantified during final design of the proposed project. Additionally, residual impacts to aquatic resources associated with such mitigation would be assessed at that time.

3.2 General Aquatic Species

Methods

Information reported within this section was obtained from a combination of literature and database searches and on-site field investigation. Additionally, information and comments received by resource agencies have been incorporated, as applicable.

Existing documentation reviewed for this section includes the following:

- Montana Natural Heritage Program (MNHP 2015) Database
- Montana Fish, Wildlife and Parks MFISH database (FWP 2016)
- StreamNet Mapper (StreamNet 2016)

HDR staff documented incidental observations of fish in the project reach of the Bitterroot River during the October 2015 site visits.

Species documented, general abundance, distribution, and habitat requirements

Nine native fish species have documented distribution in the Bitterroot River within the project vicinity based on fish distribution data maintained by the FWP (FWP 2016). Additionally, seven introduced species may potentially occur in the project reach. Westslope cutthroat trout and bull trout are special status species in Montana and are described in Section 4 and Section 5, respectively. Fish species with potential for occurrence within the project reach of the Bitterroot River, including abundance, use type, and origin, are listed in Table 3-1.

Table 3-1. Fish Species with Potential for Occurrence Within the Project Reach of the Bitterroot River

Common Name	Scientific Name	Abundance	Use Type	Origin
Brook Trout	*Salvelinus fontinalis*	Rare	Year-round resident	Introduced
Brown Trout	*Salmo trutta*	Common	Year-round resident	Introduced
Bull Trout	*Salvelinus confluentus*	Rare	Fluvial/Adfluvial population, Spawning elsewhere	Native
Largemouth Bass	*Micropterus salmoides*	Incidental	Year-round resident	Introduced
Largescale Sucker	*Catostomus macrocheilus*	Abundant	Year-round resident	Native
Longnose Dace	*Rhinichthys cataractae*	Common	Year-round resident	Native
Longnose Sucker	*Catostomus catostomus*	Abundant	Year-round resident	Native
Mountain Whitefish	*Prosopium williamsoni*	Abundant	Year-round resident	Native
Northern Pike	*Esox lucius*	Incidental	Year-round resident	Introduced
Northern Pike Minnow	*Ptychocheilus oregonensis*	Common	Year-round resident	Native
Pumpkinseed	*Lepomis gibbosus*	Incidental	Year-round resident	Introduced
Rainbow Trout	*Oncorhynchus mykiss*	Abundant	Year-round resident	Introduced
Redside Shiner	*Richardsonius balteatus*	Common	Year-round resident	Native
Slimy Sculpin	*Cottus cognatus*	Unknown	Year-round resident	Native
Westslope Cutthroat Trout	*Oncorhynchus clarkii lewisi*	Rare	Year-round resident	Native
Yellow Perch	*Perca flavescens*	Incidental	Year-round resident	Introduced
Source: FWP MFISH database, 2016.				

The Bitterroot River is an important sport fishery for anglers in western Montana, primarily for rainbow trout and brown trout. The distribution of non-native trout species is a significant limiting factor to focal species restoration and conservation (USFWS 2002).

The lower reach of O'Brien Creek in the study area vicinity supports a similar composition of species, including westslope cutthroat trout (WCT), rainbow/WCT hybrids, brown trout, brook trout, mountain whitefish, and sculpin (FWP 2015).

Potential Impacts

Short-term impacts on aquatic species in the project vicinity are anticipated due to construction-related activities and direct disturbance to the streambed of the Bitterroot River. The proposed project includes construction of two instream piers. Preliminary design includes two pier foundations of approximately 830 square feet each, which would directly impact 1660 square feet of total substrate for both pier footings. The final design has not yet been completed, but it is likely that impact pile driving would be required for installation of the bridge piers. Vibratory installation of the steel casing and drilled shafts for the piers is another possible method that may be considered. To be conservative, the effects analysis in this document assumes the use of impact piles during construction of

the bridge piers. This presents a worst-case scenario in terms of potential noise and streambed impacts.

Temporary increases in turbidity and suspended sediments are likely to occur during construction and Maclay Bridge removal. Direct disturbance of the riverbed of the Bitterroot River due to construction of the new bridge piers and removal of Maclay Bridge would result in localized increases in turbidity. Adult and larger juvenile salmonids appear to be minimally affected by the naturally high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, chronic exposure can cause physiological stress responses that increase maintenance energy and reduce feeding and growth. Disturbance and short-term increases in suspended sediment levels can also reduce light penetration, inhibit primary production, abrade and clog fish gills, prevent feeding by sight feeders, stop migration, and cause any fish in the area to avoid the disturbed reaches of the river. Temporary increases in turbidity would be short-term and construction timing would ideally occur during low flow periods when river velocity is low, thus minimizing potential for sediment to be carried downstream.

Underwater noise would be generated during construction and, in particular, during the installation of bridge piers. The use of impact hammers during pile installation could generate underwater noise that has the potential to injure or kill fish, depending on the duration and magnitude of the noise, and the size and proximity of the fish. Based on National Marine Fisheries Service (NMFS) noise thresholds for fish harm and injury, noise levels above 183 dB are considered to put fish less than 2 grams in size at risk of injury or death, while levels about 187 dB may harm fish greater than 2 grams in size (WSDOT 2015). Fish in the area could swim away from the noise disturbance and consequently be displaced, and passage through the area would be affected by elevated noise and the presence of in-water cofferdams and construction equipment. These effects would be temporary and use of the area by fish would resume after the piers are installed.

Avoidance and Minimization Recommendations

The following avoidance and minimization measures are proposed to minimize project impacts on aquatic species.

- Instream work conducted within the Bitterroot River channel shall be kept to the minimum amount necessary and completed in the shortest time possible, preferably during periods of low flow.
- If possible, schedule instream construction activities such that as many of the necessary activities as possible occur “in the dry”.
- During all in-water or near-water work and equipment operations, work activities and staff will strictly adhere to typical State of Montana water quality BMP’s. Silt fences, or other appropriate erosion control measures, shall be used on adjacent ground to minimize silt run-offs during storm events.
- Any temporary work bridge necessary should clear span the stream channel, if possible.

- No construction equipment should be allowed to operate within the active channel of any stream unless permitted to do so.
- Materials excavated from inside the drilled shaft casing would not be allowed to enter the river.
- Stormwater facilities should be designed such that return flow potential to O'Brien Creek and Big Flat Ditch be eliminated or minimized through buffers and/or appropriate sloping.

3.3 Wetlands

Methods

Information reported within this section was obtained from a combination of literature and database searches and on-site field investigation. Existing documentation reviewed for this section includes the following:

- United State Department of Agriculture, Natural Resource Conservation Service (NRCS) (USDA NRCS 2016) Custom Soil Resource Report for Missoula County Area, Montana.
- Montana Natural Heritage Program (MNHP) (2014a) Wetlands and Riparian Framework Database, which includes National Wetland Inventory Data.

HDR staff conducted a wetland field investigation in the study area on October 6 and 8, 2015, using methods described in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), as updated by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010). To be considered a wetland, an area must have hydrophytic vegetation (vegetation adapted to wetland conditions), hydric soils, and wetland hydrology. Data were collected on these three parameters in locations representative of typical site conditions.

Right-of-entry authorization to access several privately owned parcels within the project limits was denied prior to conducting field investigations. As a result, the wetland field investigation was limited to public rights-of-way and parcels where legal access was granted. This included survey of the Bitterroot River below the legal OHWM in the vicinity of the proposed bridge alignment as well as existing Maclay Bridge. The bed and banks (i.e., jurisdictional limits) of O'Brien Creek and Big Flat Ditch were delineated in GIS using topographic information derived from LiDAR elevation data and aerial imagery. Additional wetland field investigation will be necessary once legal access is provided, and prior to construction, following County acquisition of project ROW. The findings from the future wetland field investigation will be included as an addendum to this document and will be provided to the relevant resource agencies during the permitting process.

Description of Delineated Wetlands

Wetlands were detected adjacent the Bitterroot River in the vicinity of the proposed bridge alignment. Emergent wetlands fringing the active river channel were identified on both the right and left (east and west) bank of the Bitterroot River below the OHWM.

Refer to Figure 3-1 for mapped wetland and waterbodies within the vicinity of the proposed bridge. Figure 3-1 also depicts surveyed areas and areas requiring future survey. A USACE form was completed for two locations located below the OHWM of the Bitterroot River. Because of the lack of legal access onto the adjacent privately owned parcels (upland areas above OHWM), paired wetland plots were not established. Table 3-2 provides a summary of the mapped wetlands within the study area.

No wetlands were observed within the vicinity of the existing Maclay Bridge. Refer to Appendix C for completed USACE forms, completed Montana Wetland Assessment Methodology (MWAM) forms, wetland delineation methodology, representative site photos, and additional reference maps.

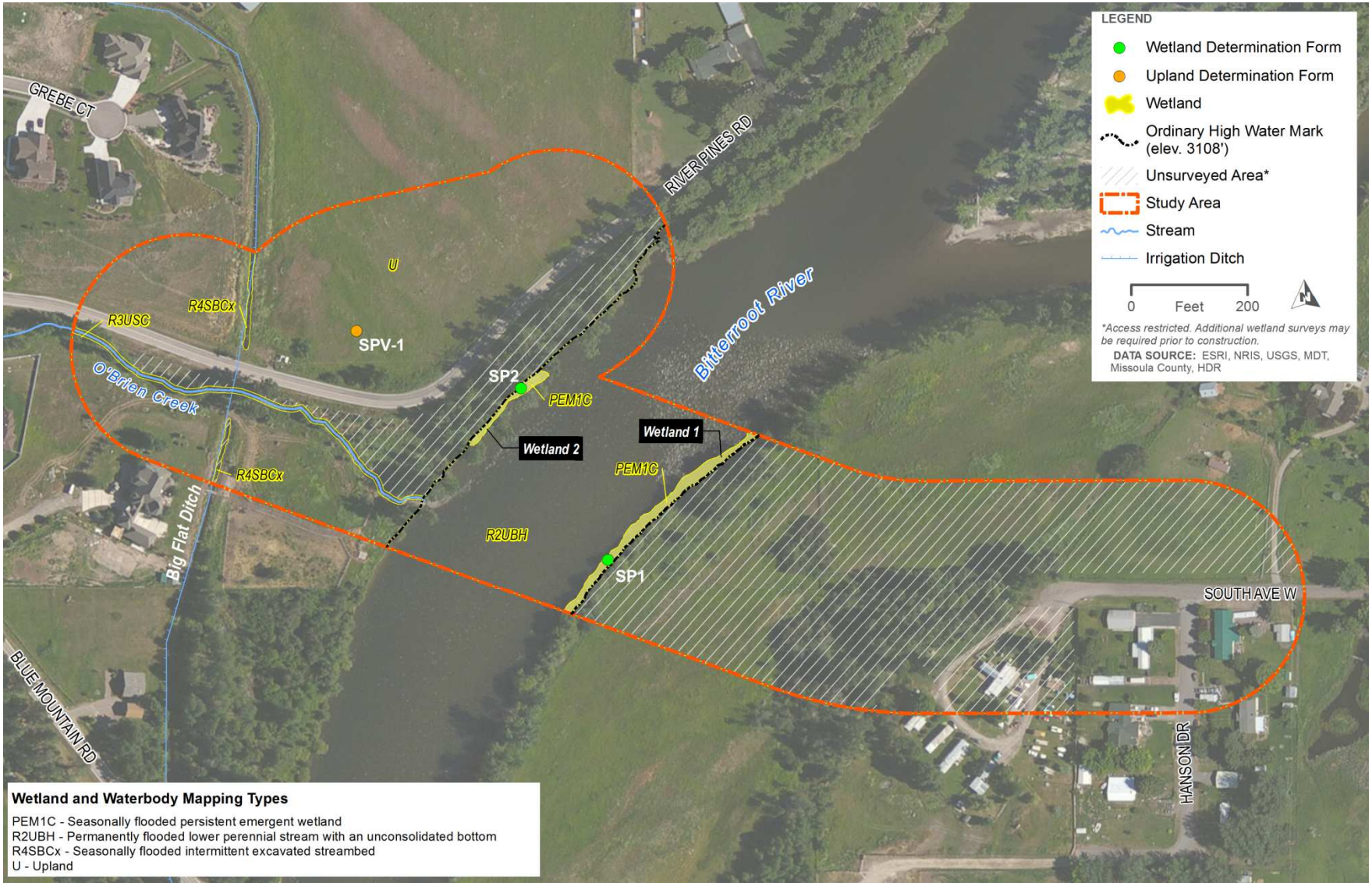

Figure 3-1. Study Area Wetlands and Waterbodies

Table 3-2. Mapped Wetlands within the Study Area

Wetland ID	Cowardin Classification[1]	Hydrogeomorphic (HGM) Classification[2]	Acreage (s.f.)
Wetland 1 (WL1)	PEM1C	Riverine	0.15 (6,611)
Wetland 2 (WL2)	PEM1C	Riverine	0.04 (1,932)
Total			**0.20 (8,543)**

[1] Cowardin et al., 1979; [2] MDT 2008.

Wetland 1 is a palustrine emergent persistent wetland (PEM1) totaling 0.15 acre (6,611 sq. ft.) in the study area. Wetland 1 is a narrow riverine fringe wetland located on the right bank of the Bitterroot River that continues upstream and downstream of the proposed bridge alignment outside of the mapped study area. Wetland 1 is dominated by common spikerush (*Eleocharis palustris*) with small amounts of lesser bladder sedge (*Carex vesicaria*) and a trace of speedwell (*Veronica arvensis*). This wetland is seasonally inundated by high river flows and receives hydrology from groundwater discharge. Wetland 1 had secondary hydrology indicators of dry-season water table and FAC-neutral test. The potential for annual disturbance of this wetland from ice scour or erosion and deposition is likely low based on observed bank characteristics. The soil profile met the hydric soil criteria for sandy redox (S5) and redox concentrations were detected both in the matrix and along pore linings.

Wetland 2 is also a palustrine emergent persistent wetland (PEM1) totaling 0.04 acre (1,932 square feet) in the study area. Wetland 2 is a riverine fringe wetland located on the left bank (west side of river). Wetland 2 is dominated by lesser bladder sedge with small amounts of common spikerush. This wetland is seasonally inundated by high river flows and receives hydrology from groundwater discharge. Wetland 2 had a primary hydrology indicator of sediment deposits and secondary hydrology indicators of geomorphic position and FAC-neutral test. The potential for annual disturbance of this wetland from ice scour or erosion and deposition is likely low based on observed bank characteristics. The soil profile lacked hydric soil indicators at the time of sampling and did not exhibit redoximorphic features even after allowing the soil to dry for a minimum of 20-30 minutes. A restrictive layer of large cobbles was encountered and shovel refusal occurred at a depth of 17 inches. The USACE recommended procedure for identifying problematic soils was followed as specified within the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* and field notes were recorded on the USACE data forms. Despite having no visible hydric soil indicators, Wetland 2 had positive indicators for hydrophytic vegetation and wetland hydrology and was therefore inferred to be hydric soils.

The MDT Montana Wetland Assessment Methodology was used to determine the functional values and overall category rating for the wetlands within the study area. Table 3-3 lists the ratings by wetland function and final ratings. Refer to Appendix C for the completed MDT Montana Wetland Assessment forms. Both wetlands receive a Category I rating because they are located below the OHWM of the Bitterroot River, which is designated as Critical Habitat for bull trout by USFWS. Based on wetland functions

alone, both wetlands score as Category III wetlands and primarily provide habitat for state-sensitive fish species, and shoreline stabilization.

Table 3-3. Summary of Wetland Function and Value Ratings and Functional Points for Study area Wetlands.

Function and Value Variables[1]	WL1	WL2
A. Listed/Proposed T&E Species Habitat	High (1)	High (1)
B. MT Natural Heritage Program Species Habitat	High (0.9)	High (0.9)
C. General Wildlife Habitat	Mod (0.7)	Mod (0.7)
D. General Fish Habitat	Mod (0.3)	Mod (0.3)
E. Flood Attenuation	Mod (0.5)	Mod (0.5)
F. Short and Long Term Surface Water Storage	Low (0.3)	Low (0.3)
G. Sediment/Nutrient/Toxicant Removal	Mod (0.4)	Mod (0.4)
H. Sediment/Shoreline Stabilization	Mod (0.6)	High (0.9)
I. Production Export/Food Chain Support	Mod (0.6)	Mod (0.6)
J. Groundwater Discharge/Recharge	Low (0.1)	Low (0.1)
K. Uniqueness	Low (0.3)	Low (0.3)
L. Recreation/Education Potential (bonus points)	NA	NA
ACTUAL POINTS/POSSIBLE POINTS	5.6/11	5.9/11
PERCENT OF POSSIBLE SCORE ACHIEVED	51%	54%
OVERALL CATEGORY RATING (FUNCTIONAL RATING)	**I (III)**	**I (III)**

[1] *Refer to Appendix C for MDT Montana Wetland Assessment Forms.*

Potential Impacts

Precise construction limits are not presently defined; however, based on preliminary plans, no impact on Wetland 1 or Wetland 2 is anticipated. Bridge abutments and associated rip rap would be located outside the active river channel above OHWM (i.e., landward of wetland boundaries) and will therefore avoid impacting the mapped wetlands.

As previously described, additional wetland survey will be required prior to construction for privately owned properties that have not been investigated for wetlands and will be affected by the proposed project. Based on site characteristics and review of existing databases, the potential for additional wetlands within the study area is low. The results of the future wetland investigation will be included as an addendum to this report, which will support future Section 404 permitting requirements.

Avoidance and Minimization Recommendations

Permanent wetland impacts will continue to be avoided and minimized to the extent practicable throughout the design process. The design footprint would be minimized as to avoid unnecessary impacts to wetlands. The required volume and overall area of rip

rap will be minimized to the extent practicable based on the hydraulic recommendations for scour protection.

Required Permitting

Section 404 of the Clean Water Act requires approval prior to discharging dredged or fill material into waters of the United States, including wetlands. Although wetland impacts are not anticipated, the proposed project will require a Section 404 permit to authorize fill placement within the OHWM of the Bitterroot River for construction of the bridge piers[2] and modification of the Big Flat Ditch, which is regulated as waters of the U.S. It is anticipated that the proposed project will be authorized under Nationwide Permit 14, Linear Transportation Projects as the impacts to waters of the U.S. are anticipated to be less than 0.5 acre. A preconstruction notification to the USACE in accordance with General Condition No. 31 is required for projects impacting the Bitterroot River. Additionally, preconstruction notification in accordance with General Condition No. 18 is required for activities that may affect any federally-listed species or designated critical habitat. Additional permitting requirements will be necessary for temporary structures during construction of the new bridge and removal of Maclay Bridge (i.e., coffer dams, work bridges, etc.) based on contractor means and methods.

Proposed Compensatory Wetland Mitigation Strategy

No compensatory wetland mitigation is proposed at the present time. Appropriate wetland mitigation will be determined during permitting once final wetland impacts, if any, are known.

4 Species of Concern and Special Status Species

Montana species of concern (SOC) include native plants or animals 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 proactively direct limited resources to priority data collection needs and address conservation needs.

Methods

Spatial data pertaining to sensitive animal species within and adjacent to the study area was provided by the MNHP on September 15, 2015. The database includes a list of sensitive animal species that have documented occurrences in the vicinity of the study area. Plant SOC were queried as part of spatial data; however, no plant SOC were found within or adjacent the study area. HDR staff conducted a qualitative assessment of potential occurrence of SOC during the October 2015 site visits; no species-specific surveys were conducted.

[2] Bridge pilings may be exempt from Section 404 permitting requirements per 33 CFR 323.3.

A one-half mile search radius was applied to the study area to determine the species with likely occurrence within the study area. The results are listed in Table 4-1. Note that the bull trout is also included in the MNHP database of sensitive species; however, this species is described under Section 5 below.

Table 4-1. Montana Natural Heritage Program's Species of Concern With Documented Occurrences within One-Half Mile of the Study area

Species	MNHP Ranking(s)[a]	General Habitat Requirements	Known Distribution in Study area Vicinity
Fish			
Bull trout (*Salvelinus confluentus*)	G4, S2	Mountain streams, rivers, lakes	Documented to occur in the Bitterroot River; although no records of species occurrence are available within the project reach. Study area is located within general distribution.
Westslope cutthroat trout *(Oncorhynchus clarkii lewisi)*	G4T3, S2	Mountain streams, rivers, lakes	Documented to occur in the Bitterroot River. Study area is located within general distribution.
Birds			
Bald Eagle *(Haliaeetus leucocephalus)*	G5; S4	Riparian forest	No nests documented within the study area. Nearest nests documented near Maclay Flats approximately 1.3 miles southeast of the proposed project. Study area is located within general distribution.
Black-backed woodpecker *(Picoides arcticus)*	G5; S3	Conifer forest burns	No records documented within the study area. No preferred habitat within project limits.
Bobolink *(Dolichonyx oryzivorus)*	G5; S3B	Moist grasslands	No records documented within the study area. Study area is located within general distribution. Documented within the Clark Fork River-Grass Valley Important Bird Area (IBA), which includes the study area vicinity and covers an expansive area along the Bitterroot and Clark Fork rivers within the Missoula Valley.
Cassin's Finch *(Haemorhous cassinii)*	G5; S3	Drier conifer forest	No records documented within the study area. Study area is located within general distribution.
Great blue heron *(Ardea herodias)*	G5; S3	Riparian forest	No records documented within the study area. Study area is located within general distribution. Documented within the Clark Fork River-Grass Valley IBA.
Lewis's woodpecker *(Melanerpes lewis)*	G4; S2B	Riparian forest	No records documented within the study area. Study area is located within general distribution. Documented within the Clark Fork River-Grass Valley IBA.
Pileated woodpecker *(Dryocopus pileatus)*	G5; S3	Moist conifer forests	No records documented within the study area. Study area is located within general distribution. Documented within the Clark Fork River-Grass Valley IBA.
Varied thrush *(Ixoreus naevius)*	G5; S3B	Moist conifer forests	No records documented within the study area. Study area is located within general distribution.

Species	MNHP Ranking(s)[a]	General Habitat Requirements	Known Distribution in Study area Vicinity
Veery *(Catharus fuscescens)*	G5; S3B	Riparian forest	No records documented within the study area. Study area is located within general distribution. Documented within the Clark Fork River-Grass Valley IBA.
Mammals			
Fisher *(Pekania pennant)*	G5; S3	Mixed conifer forests	No records documented within the study area. No preferred habitat within project limits.
Fringed myotis *(Myotis thysanodes)*	G4; S3	Riparian and dry mixed conifer forests	No records documented within the study area. Study area is located within general distribution.
Hoary Bat *(Lasiurus cinereus)*	G5; S3	Riparian and forest	Last observation date is 1916. No records documented within the study area. Study area is located within general distribution.
Little brown myotis *(Lasiurus cinereus)*	G3; S3	Generalist	Last observation documented in 1965. No records documented within the study area. Study area is located within general distribution.
Reptiles			
Western skink *(Plestiodon skiltonianus)*	G5; S3	Open conifer forest and adjacent grasslands	Last observation documented in 1929. No records documented within the study area. Study area is located within general distribution.
Invertebrates			
Western pearlshell	G4G5; S2	Mountain streams, rivers	Documented within the Bitterroot River. Potential occurrence within the study area.

Sources: MNHP 2015
[a] See Appendix D for MNHP status definitions
Note: Bull trout is also included in the MNHP SOC database; however, this species is described under Section 5.

4.1 Plants

Species observed/documented, general abundance, distribution, and habitat requirements

No sensitive plant species were found during the October 2015 site visits, and no sensitive plant species are documented by MNHP within a one-mile search radius of the study area.

Potential Impacts

The proposed project is not anticipated to affect sensitive plant species or potential suitable habitat.

Avoidance and Minimization Recommendations

No avoidance or minimization measures are recommended at this time.

4.2 Terrestrial Species

Species observed/documented, general abundance, distribution, and habitat requirements

No terrestrial SOC or sign of these species were detected during the October 6 and 8 2015 site visits within the vicinity of the proposed South Avenue Bridge alignment.

MNHP biologists detected bat droppings indicative of nocturnal bat roosts under the existing Maclay Bridge during surveys conducted in June 2014; however, no bats were observed directly at the site (MNHP 2015; B. Maxell, MNHP pers. comm. May 10, 2016). MNHP categorized the roost as a Class 2 (relatively low use) open nocturnal roost lacking ideal crevices for bats, which is only used at night for bats to stop, rest, and digest a meal. The bat droppings were found concentrated at east end of the bridge, with sparse droppings along beams and at sheltered corners of the abutments. The species of bat could not be determined from the 2014 MNHP survey; however, according to MNHP, likely species to be using bridges of this type include big brown bat, little brown bat, western small-footed myotis, and Yuma myotis. Bat species documented in the project vicinity include fringed myotis, little brown myotis, and hoary bat (MNHP 2015), which are all SOC.

Bald eagles, a Montana Special Status Species, were not observed within the project vicinity during the October 2015 field survey. The nearest known bald eagle nest occurs within approximately 1.3 miles southeast of the project vicinity (MNHP 2015). Documented nest locations are also located approximately 1.6 miles northeast of the project vicinity near Kelly Island. No nests, concentrated foraging areas or communal roosts sites were detected in the project vicinity, nor are they documented within one-half mile of the proposed project (MNHP 2015).

Potential Impacts

Removal of the existing Maclay Bridge will result in the loss of a bat roost site. However, removal of Maclay Bridge is anticipated to have negligible impact on bats considering the low quality and low relative use of this roost. New roost sites may be established underneath the new South Avenue Bridge structure once constructed.

If night-time work were to occur, temporary construction disturbance from light, odor, and noise and vibration could discourage bats that sporadically use the bridge from emerging or cause abandonment of the roost site (Smith and Stevenson 2015). Disturbance will be avoided because work will likely occur during daytime hours.

Temporary construction noise is unlikely to disrupt bald eagle behavior or reproduction because the proposed project is not within half a mile of bald eagle nest sites, concentrated foraging areas, and communal roost sites. A distance of one-half mile is the recommended distance between potentially disturbing activities and bald eagle nests (Montanan Bald Eagle Working Group 2010).

Avoidance and Minimization Recommendations

The following avoidance and minimization measures are proposed to minimize project impacts on terrestrial SOC.

- Construction activities should be limited to daytime hours to the extent possible during periods when bats are most active (May through September [Hendricks et al. 2005]).
- Before working near known bat roosts, construction crews should be encouraged to avoid disturbing the bats as much as possible, and instructed not to handle them.
- A special provision shall be developed instructing the contractor to coordinate with FWP prior to initiating construction to identify eagle nest locations. If a nest occurs within 0.5 mile of the project, comply with the temporary seasonal and distance construction buffers stipulated in the 2010 *Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan (1994)*.

4.3 Aquatic Species

Species observed/documented, general abundance, distribution, and habitat requirements

Two SOC fish species are documented to occur within the study area vicinity in the mainstem Bitterroot River, including the proposed project reach (FWP 2016; MNHP 2015). Bull trout and westslope cutthroat trout are considered SOC by the MNHP and are important indicator species for environmental disturbance. Bull trout are designated as "threatened" by the USFWS and are discussed below in Section 5. Westslope cutthroat trout are a native species that inhabit the Bitterroot River throughout the watershed. Their historical range included all of Montana west of the Continental Divide as well as the upper Missouri River drainage. The major factors contributing to the decline of this species are hybridization with rainbow and/or Yellowstone Cutthroat Trout (*Oncorhynchus clarkii bouvieri*), and habitat loss and degradation (FWP 2015).

Westslope cutthroat trout are common in headwaters, lake, and stream environments. They feed primarily on aquatic insects and zooplankton. Spawning and rearing streams tend to be cold and nutrient poor. In the spring, westslope cutthroat trout seek out gravel substrate in riffles and pool crests for spawning habitat. Juvenile cutthroat trout overwinter in the interstitial spaces of large stream substrate. Adult cutthroat trout need deep, slow moving pools that do not fill with anchor ice in order to survive the winter (Brown and Mackay 1995).

Potential Impacts

Short-term impacts on aquatic species in the vicinity of the project are anticipated due to construction-related activities and direct disturbance to the Bitterroot River. The presence westslope cutthroat trout in the study area is likely incidental and limited to transients, but if present, individuals would be exposed to construction noise and potential sediment and turbidity effects as described for general aquatic species in Section 3.2.

Avoidance and Minimization Recommendations

The following avoidance and minimization measures are recommended to minimize project impacts on aquatic species.

- Instream work conducted within the Bitterroot River channel shall be kept to the minimum amount necessary, preferably during periods of low flow. This includes installations of coffer dams and piers within the river channel. Instream construction work shall be completed in the shortest amount of time possible.
- During all in-water or near-water work and equipment operations, work activities and staff will strictly adhere to typical State of Montana water quality BMP's. They will include developing, implementing, and maintaining a Spill Prevention Control and Countermeasures Plan (SPCC) to manage toxic materials associated with construction activities (e.g., equipment leakage, disposal of oily wastes, cleanup of any spills, and storage of petroleum products/chemicals in contained areas away from streams). Silt fences (or similar BMP) to be used on adjacent ground to minimize silt run-offs during storm events.
- Should equipment be required to work within the active river channel, BMPs would be implemented to minimize and contain turbidity to reduce/prevent sediment transport downstream. Instream construction activities would be scheduled to occur within the in-water work window which also coincides with low flow periods and as many of the necessary construction activities as possible could occur "in the dry."
- Do not allow materials excavated from inside the drilled shaft casing for the pier to enter the river.

5 Threatened and Endangered Species Preliminary Biological Assessment

Section 7 of the Endangered Species Act (ESA) [16 U.S.C. 1531 *et seq.*] outlines the procedures for Federal interagency cooperation to protect federally listed species and conserve designated critical habitats. Section 7 requires Federal agencies to determine the effects of the proposed action on threatened, endangered, and proposed species and to consult with the USFWS for concurrence on the determination of effect. This section provides the Preliminary Biological Assessment of the proposed action's effect on federally listed species and designated critical habitats.

Methods

Information reported within this section was obtained from a combination of agency consultation and coordination, a review of literature and database searches, and on-site field investigation. The November 25, 2016 publication of Endangered, Threatened, Proposed and Candidate Species by Montana County for Missoula County available through the USFWS's Montana Ecological Field Office (USFWS 2016a) was reviewed to determine the federally listed species potentially occurring in Missoula County. A list of federally listed endangered, threatened, proposed, and candidate species to be

considered for this project was generated based on the USFWS and MNHP data. The MNHP is a clearing house for federally listed threatened, endangered, proposed and candidate species in the state of Montana. Geospatial data containing federally listed species distribution and occurrence data in the vicinity of the study area was obtained on August 1, 2016 using the USFWS Information for Planning and Conservation (IPaC) system and are provided in Appendix D. For analysis purposes, a one-mile radius search area was used to determine if any federally listed species have been documented in the vicinity of the proposed project. Existing documentation reviewed for this section includes the following:

- Montana Natural Heritage Program (MNHP 2015) Database
- Montana Fish, Wildlife and Parks Montana Fisheries Information System (MFISH) (FWP 2016)

Fish and wildlife biologists from MDT, FWP and USFWS were consulted regarding fish and wildlife resources in the study area.

Field Survey

HDR staff conducted reconnaissance-level field surveys at the project site on October 6 and 8, 2015. HDR staff qualitatively documented instream habitat of the Bitterroot River approximately 200 feet upstream and downstream of the proposed bridge alignment and approximately 100 feet upstream and downstream of Maclay Bridge. General observations of stream morphology, substrate, instream habitat features such as large woody debris, and general streambank and riparian conditions were noted during the field investigation. Additionally, any incidental observations of wildlife species or sign were recorded.

Project Action Area

The action area for the proposed project is defined as “all areas to be affected directly or indirectly by the proposed action and not merely the immediate area directly adjacent to the action” (50 CFR §402.02). Project components that pose potential effects include construction noise, sedimentation and turbidity downstream during construction activities in the river channel, clearing and grading resulting from construction activities, and operation of the bridge.

Aquatic Portion of the Action Area

The aquatic portion of the action area is defined by the furthest extent of effects anticipated as a result of instream work. As described in Section 1.1, instream work for both the construction of the new South Avenue Bridge and demolition of the Maclay Bridge will likely involve the use of pile driving and isolation of work areas by installing coffer dams. This would produce the greatest impact extent from underwater noise. Ambient underwater noise has not been measured at the bridge location, but can be estimated from river characteristics. Ambient noise levels in deep freshwater lakes or deep slow moving rivers are approximately 135 dB RMS and in shallow (1 foot deep or less), fast moving rivers, the ambient noise levels are louder and are approximated to 140 dB RMS in these systems (Laughlin 2005 as cited in WSDOT 2015).

The size and type of pile affect the amount of sound generated by pile-driving activities. Current design for the proposed bridge anticipates the use of 16 to 24 inch diameter

steel piles for the pier foundations depending on final geotechnical recommendations. Studies conducted by the Washington State Department of Transportation (WSDOT) report underwater noise levels for 24 inch steel piles at 189 dB RMS measured at 33 feet from the pile. Using the practical spreading model (WSDOT 2015) and 135 dB ambient for a flowing river, if sound from the impact pile driving was unimpeded through the water, it would not dissipate to ambient levels until approximately 24 miles. However, underwater noise propagation in rivers is limited by the sinuosity of a system and generally dissipates at river bends, beyond line-of-sight (WSDOT 2015). The Bitterroot River bends to the west downstream of the Maclay Bridge. This bend in the river would disrupt the propagation of the underwater noise where it curves out of line-of-sight at approximately 1,200 feet downstream from the proposed construction location where piles would potentially be installed for work trestles to facilitate demolition of the existing bridge.

Upstream of the proposed South Avenue Bridge site, the river bends around to the east and out of line-of-site at approximately 3,300 feet. Noise effects from pile driving for the bridge piers would dissipate at these distances and these form the upstream and downstream boundaries of the aquatic action area for the project. Due to the shallow water levels in O'Brien Creek as well as its small size and sinuosity, underwater noise effects from pile driving would not propagate beyond the mouth and first bend in O'Brien Creek less than 100 feet from the confluence with the Bitterrooot River. If drilled shaft pier installations are used, sound impacts underwater would be reduced due to lower decibel levels produced from that construction method, but the line-of-sight upstream and downstream aquatic action area boundaries would remain the same since these distances are less than the distance underwater construction noise would propagate.

Temporary sediment and turbidity induced from instream work during construction of the piers for the new bridge, and pier removal for the Maclay Bridge is anticipated to dissipate within the downstream extent of the noise impacts as the river bends to the west downstream of the existing Maclay Bridge site during removal of the piers. Work in the river would occur within the in-water work window when summer low flows generally occur. Coffer dams would be used to isolate work areas around the piers in the river channel and reduce downstream turbidity effects to periods of coffer dam installation and removal.

The presence of the proposed bridge piers within the river channel could alter hydraulics downstream. The size of the piers are small in relation to the river at the bridge crossing location, therefore any hydraulic effects would be expected to dissipate over relatively short distances. Because noise impacts are expected to dissipate to background levels in the river around 3,300 feet upstream of the proposed bridge site and approximately 1,200 feet downstream of Maclay Bridge, beyond any turbidity or hydraulic effects, the aquatic portion of the action area would be determined by noise impacts (Figure 5-1).

Terrestrial Portion of the Action Area

The terrestrial portion of the action area is defined based on the potential for noise associated with operation of construction equipment. The locations of the construction contractors' staging and equipment areas are unknown at this stage in the project, but these sites would be located in existing ROW and previously disturbed areas along existing roadways and agricultural fields landward of riparian areas. Baseline noise levels

for the project site were assumed to be about 55 dB based on the rural character of the area (WSDOT 2015).

The loudest equipment potentially used for this project could be an impact pile driver for the installation of the bridge piers. According to WSDOT (2015), impact drivers can produce peak decibels of 110 dBA (in-air) as measured 50 feet from the device. Decibel addition rules are not applicable since noise associated with the next loudest noise-producing equipment anticipated to be used (excavator 81dB) differs by more than 10 dB when compared to the vibratory driver. Using a point-source sound attenuation model where a 6 dB noise reduction occurs per doubling distance from the activity, with an additional 1.5 dB of reduction due to soft site characteristics in the study area, noise should attenuate to baseline levels approximately 7,925 feet from the proposed bridge crossing when pile driving is being used. Topography and site characteristics affect the propagation of sound, and the hills located to the southwest of the project site would reduce the extent of noise in that direction. For this analysis however, a simplified uniform distance was used as a conservative area to assess potential impacts. Therefore, the terrestrial portion of the action area extends 7,925 feet (1.5 miles) in all directions from the proposed South Avenue Bridge and the existing Maclay Bridge locations (Figure 5-1).

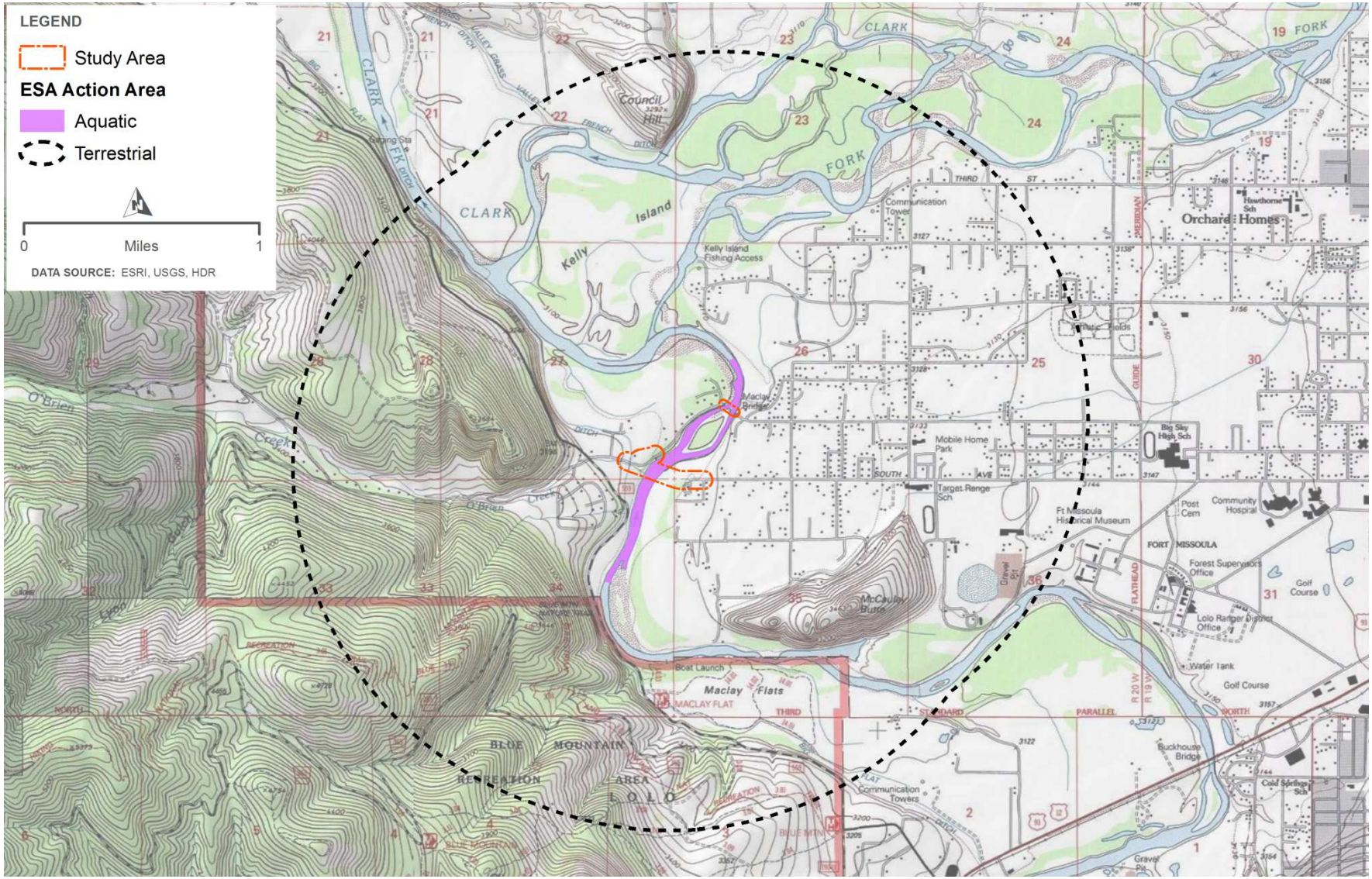

Figure 5-1. Project Action Area

Environmental Baseline

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State or private actions and other human activities in the action area. Representative project site photographs are presented in Appendix C. As described in Section 1, the project is located in Missoula County between the western terminus of South Avenue on the east side of the Bitterroot River and River Pines Road on the west side of the Bitterroot River. The project is located in Sections 26, 27, 34 and 35 of Township 13 North, Range 20 West, Montana Principle Meridian, and is centered at approximately 46.8491° North latitude and 114.1043° West longitude. Refer to Figure 1-1 for detail.

Environmental baseline conditions for terrestrial and aquatic areas within the project area are described in previous sections above. Section 2.1 describes general habitat and vegetation; Section 3.1 describes project area waterways; and Section 3.3 describes wetlands identified within the project area.

Species status, distribution, habitat requirements, reasons for decline

Federally-threatened, endangered, proposed and candidate species potentially occurring in Missoula County are listed in Table 5-1 along with their respective federal status. There are six federally listed species, one proposed species, and one candidate species with the potential to occur in Missoula County.

Table 5-1. Federally Listed Species Occurring in Missoula County, MT

Common Name	Scientific Name	Status[a]
Whitebark Pine	*Pinus albicaulis*	C
Canada Lynx	*Lynx canadensis*	LT, CH
Bull Trout	*Salvelinus confluentus*	LT, CH
Yellow-billed cuckoo (western pop.)	*Coccyzus americanus*	LT
Water Howellia	*Howellia aquatilis*	LT
Grizzly Bear	*Ursus arctos horribilis*	LT
Wolverine	*Gulo gulo*	P
Red Knot	*Calidris canutus rufa*	LT

Sources: USFWS 2016a
[a] C = Candidate; CH = Designated Critical Habitat; LT = Listed Threatened; P = Proposed

Based on review of federal, state, and local agency databases (FWP 2015; StreamNet 2016; NOAA 2016), there are no species or critical habitat under the purview of NMFS that are expected to occur in the action area.

The following sections provide additional information on the species listed in Table 5-1. Of these species, only bull trout (and bull trout critical habitat) and yellow-billed cuckoo have potential to occur within the action area and therefore greater detail is provided below for each of these species.

Whitebark Pine

The whitebark pine (*Pinus albicaulis*) is a candidate species that occurs in Missoula County. It occurs in upper subalpine forests at elevations of 4,200 – 12,000 feet (Flora of North America 1993). Whitebark pine historically dominated many of the upper subalpine plant communities of the western United States and was a major component of subalpine forests in the northern Rocky Mountains, the northern Cascades, the Blue Mountains, and the Sierra Nevada. It is, however, severely threatened in the majority of its range by introduced white pine blister rust (*Cronartium ribicola*), outbreaks of mountain pine beetle (*Dendroctonus ponderosae*), succession resulting from decades of fire suppression, climate change resulting in decreases in suitable habitat, and various synergies between these factors.

This species occurs in Missoula County, but inhabits forested areas at elevations approximately 1,000 feet higher than the project site, well outside the action area. MNHP spatial data indicates no occurrences of whitebark pine within a one-mile radius of the action area (MNHP 2015). Due to a lack of suitable habitat and documented occurrences within the vicinity of the proposed project, the whitebark pine would not be affected and is not analyzed further in this assessment.

Canada Lynx

The Canada lynx (*Lynx canadensis*) was listed as threatened under the ESA in 2000 (65 FR 16053 16086), and critical habitat was designated in 2009 that includes the boreal forests of northwestern Montana and the area around the Greater Yellowstone Ecosystem (74 FR 8616 8702).

Canada lynx west of the Continental Divide generally occur in subalpine forests at elevations between 4,000 and 7,000 feet in stands of lodgepole pine or mixed stands of subalpine fir, lodgepole pine, Douglas-fir, grand fir, western larch and hardwoods (Ruediger et al. 2000). Within these habitat types, disturbances that create early successional stages such as fire, insect infestations, and timber harvest, provide foraging habitat for lynx by creating forage and cover for snowshoe hares, their primary prey (Ruediger et al. 2000).

Critical habitat for the Canada lynx is designated within northwestern Montana but is in more mountainous areas and well outside the action area. The closest critical habitat to the action area is approximately 9 miles to the northeast.

Due to lack of suitable habitat for this species in the action area it is not expected to occur in the action area or in the vicinity of the proposed project. Therefore, the Canada lynx would not be affected and is not analyzed further in this assessment.

Grizzly Bear

The grizzly bear (*Ursus arctos horribilis*) was listed as threatened under the ESA in 1975 in the conterminous 48 states (40 FR 31734). Habitat loss and human encroachment are the primary reasons for population decline in grizzly bear populations (Reel et al. 1989). It is estimated between 1,400 and 1,700 grizzlies remain in the lower 48 states (USFWS 2016b).

Presently, there are five regions where grizzlies are known to occur: Yellowstone ecosystem, Northern Continental Divide ecosystem, Cabinet-Yaak ecosystem, Selkirk

ecosystem, and Northern Cascades ecosystem. Grizzly bears are wide-ranging mammals requiring large areas of undisturbed habitat. Home ranges can vary considerably from approximately 11 to 2,000 square kilometers (7 to 1,245 sq. mi.) and are dependent upon food distribution (Reel et al. 1989). The defined action area is located outside of the southwest boundary of the Northern Continental Divide Grizzly Bear Recovery Zone and outside of the southeast boundary of the Cabinet-Yaak Grizzly Bear Recovery Area.

Although possible distributional ranges of the grizzly bear could fall within undeveloped mountainous areas within the vicinity of the proposed action, due to the semi-urban nature and lack of suitable habitat for this species in the action area, grizzlies are not expected to occur in the action area or in the immediate vicinity of the proposed project. Therefore, the grizzly bear would not be affected and is not analyzed further in this assessment.

Water Howellia

Water howellia (*Howelia aquatilis)* was federally listed as threatened without critical habitat in 1994 (59 FR 56590) and a draft recovery plan was prepared in 1996. Water howellia is a Pacific Northwest endemic known to occur sporadically in Washington, Idaho, California, and Montana. This species' habitat is limited to small depressional wetlands with consolidated bottoms that partially or completely dry up by the fall (MNHP 2016c). These wetlands include shallow, low-elevation glacial pothole ponds and former river oxbows with margins of deciduous trees and shrubs. The plants tend to root in the shallow water at the edges of deeper ponds that are typically surrounded by deciduous trees. Water howellia in Montana is restricted to the Swan Valley (MNHP 2016c).

Reasons for the decline of water howellia and its habitat include many human-related factors, including, urbanization, timber harvest activities, livestock grazing, road construction, and conversion of habitat to other uses. Wetland succession and encroachment by non-native plants such as reed canarygrass and purple loosestrife have also contributed to the decline of this species.

Due to lack of suitable habitat for this species, water howellia is not expected to occur in the action area or in the vicinity of the proposed project. MNHP spatial data indicates no occurrences of this species within a one-mile radius of the action area (MNHP 2015). Therefore, water howellia would not be affected and is not analyzed further in this assessment.

Wolverine

In February 2013, the USFWS proposed listing the distinct population segment (DPS) of the North American wolverine (*Gulo gulo*) occurring in the contiguous U.S. as a threatened species under the ESA (78 FR 7864). The USFWS subsequently withdrew its proposed rule in August 2014 stating that the factors affecting the DPS as identified in the proposed rule were not as significant as believed at the time of the proposed rule's publication in 2013. As a result of court order, in April 2016, the USFWS withdrawal was vacated and the status of the wolverine was reverted to a proposed listing. On October 18, 2016, the USFWS issued a notice that the agency was reopening the comment period on the February 2013 proposed rule to list the DPS of wolverine as threatened.

Preferred habitat for wolverine is limited to alpine tundra, and boreal and mountain forests (primarily coniferous) in the western mountains, especially large wilderness areas (MNHP 2016e). Wolverines are typically found in areas with snow cover in the winter. Wolverines in northwestern Montana tend to occupy higher elevations in summer and lower elevations in winter. Researchers in Montana have reported habitat requirements of large, isolated tracts of wilderness with minimal to no roads that supports a diverse prey base (MNHP 2016e).

Reasons for the decline of wolverine numbers in U.S. are predominantly attributed to a reduction of habitat due to climate change; habitat impacts due to human use and disturbance; dispersed recreational activities; infrastructure development, including transportation corridors (USFWS 2013). Additional factors, as described in the proposed rule, have also been attributed to the decline of the species. The wolverine population in the contiguous U.S. is estimated at 250 to 300 individual wolverines, with the majority of them occurring in the northern Rocky Mountains (USFWS 2013).

Due to lack of suitable habitat for this species, the wolverine is not expected to occur in the action area or in the vicinity of the proposed project. MNHP spatial data indicates no occurrences of this species within a one-mile radius of the action area (MNHP 2015). Therefore, it is anticipated that wolverine would not be affected by the proposed action and is therefore not analyzed further in this assessment.

Red Knot

The red knot (*Calidris canutus rufa*) was listed as Threatened by the USFWS on January 12, 2015 (79 FR 73705 73748). In the listing decision, the USFWS cited the primary factors threatening the species as loss of breeding and nonbreeding habitat, disruption of natural predator cycles on breeding grounds, reduced prey availability throughout the nonbreeding range, and increasing frequency and severity of mismatches in the timing of the birds' annual migratory cycle relative to favorable food and weather conditions (MNHP 2016f). The red knot migrates annually between its breeding grounds in the Canadian Arctic and several wintering regions, including the Southeast United States, the Northeast Gulf of Mexico, northern Brazil, and Tierra del Fuego at the southern tip of South America. Researchers have documented migration patterns for red knots wintering along the Texas coast use the Central Flyway (passing over eastern Montana) on both north- and south-bound migrations (MNHP 2016f). No critical habitat has been designated in Montana. No evidence of breeding or overwintering exists for Montana.

Migratory stopovers of this long-distance migrant in Montana are infrequent and occur at larger wetlands scattered across the state. Sixty percent of documented stopovers occurred at Freezeout Lake (Teton County), Benton Lake National Wildlife Refuge (Cascade County), and Lake Bowdoin National Wildlife Refuge (Philips County) (MNHP 2016f). Only one observation has been documented within Missoula County, which was recorded on September 9 to September 13, 1991, at the Frenchtown paper mill ponds, approximately 10 miles northwest of the project area (MNHP 2016g). In total, there are approximately 50 observations documented for individuals stopping at Montana wetlands, with only 0-4 for any given year since the 1970s, and 60 percent of observations have occurred in May associated with northward migration (MNHP 2016f). Only one occurrence has been documented in Montana since 2005.

General habitat characteristics preferred by the red knot include tidal flats, shorelines, and tundra (in the summer) (Audubon Society 2016). For the rare migrant passing through Montana, the preferred habitat appears to be large, contiguous wetland complexes, typically many thousands of acres in size, containing substantial open water and shoreline. These open water habitat requirements are necessary to provide invertebrates, and particularly small mollusks, which is the major food source for the red knots (MNHP 2016f).

Due to lack of suitable habitat for this species and general decline of documented occurrences in Montana over the past several decades, the red knot is not expected to occur in the vicinity of the proposed project. Therefore, it is anticipated that red knot would not be affected by the proposed action and is therefore not analyzed further in this assessment.

Bull Trout

Status and Life History

The USFWS defined a single DPS for bull trout (*Salvelinus confluentus)* within the coterminous United States and listed them as threatened under the ESA in 1999 (64 FR 58910). This single DPS is subdivided into six biologically-based recovery units, of which the Columbia headwaters recovery unit contains the Bitterroot River population (USFWS 2015b).

Bull trout occur in nearly all of the Columbia River Basin in higher elevation tributaries in Washington, Oregon, Idaho, Montana, and a small part of Nevada. The historical range of bull trout includes major river basins in the Pacific Northwest at about 41 to 60 degrees North latitude, from the southern limits in the McCloud River in northern California and the Jarbidge River in Nevada to the headwaters of the Yukon River in the Northwest Territories, Canada (Cavender 1978). Although bull trout are presently widespread within their historical range, they have declined in overall distribution and abundance during the last century. Dams, forest management practices, agriculture, roads and mining are primary land and water management activities that threaten bull trout and degrade its habitat (USFWS 1998a). In addition, native bull trout have been displaced in many areas through competitive interaction with introduced brook trout. Bull trout and brook trout can interbreed and the offspring are sterile hybrids, further contributing to bull trout population decline (FWP 2015).

Bull trout express both resident and migratory life history strategies (Rieman and McIntyre 1993). Resident forms of bull trout complete their entire life cycle in the tributary (or nearby) streams in which they spawn and rear. Migratory bull trout spawn in tributary streams, where juvenile fish rear for 1 to 4 years before migrating to either a lake (adfluvial form) (Downs et al. 2006), river (fluvial form) (Fraley and Shepard 1989), or in certain coastal areas, to saltwater (anadromous) (Cavender 1978, McPhail and Baxter 1996; Brenkman and Corbett 2005). Bull trout have more specific habitat requirements than most other salmonids (Rieman and McIntyre 1993) and require very cold water for spawning (46 ºF) and egg incubation (below 40 ºF). High-quality spawning and rearing habitat is typically characterized by cold temperatures; abundant cover in the form of large wood, undercut banks, and boulders; clean substrate for spawning; intergravel spaces large enough to conceal juveniles; and stable channels (USFWS 2015b). Spawning areas are often in headwater streams and associated with coldwater springs,

groundwater infiltration, and the coldest streams in a given watershed (USFWS 2015a; Rieman and McIntyre 1993).

Bull trout reach sexually maturity in 4 to 5 years. Spawning takes place between late August and early November, principally in third and fourth order streams. Bull trout prefer spawning habitat in low-gradient stream reaches with loose, clean gravel (Fraley and Shepard 1989) and do not tolerate high sediment levels in their spawning streams. Sediment can suffocate the developing embryos before they hatch.

Occurrence in Action Area

The reach of the Bitterroot River within the project action area is known to be occasionally used by bull trout for overwintering, is a migratory corridor, and has been designated as a critical habitat for the species, and serves as foraging, migratory, and overwintering (FMO) habitat (Mike McGrath, USFWS pers. com. Aug. 12, 2015; StreamNet 2016). The project action area and surrounding lower mainstem of the Bitterroot River does not contain bull trout spawning or rearing habitat, and is well known as being too warm for bull trout in the summer (Ladd Knotek, FWP pers. com. July 23, 2015). O'Brien Creek is the only perennial tributary in the project reach of the Bitterroot River, and its mouth can serve as a cold water refuge for bull trout and other fish species in summer months (Mike McGrath, USFWS pers. com. Aug 12, 2015). While the creek mouth may act as a temperature refuge or winter foraging area for adults, O'Brien Creek is not used by bull trout for spawning or rearing (FWP 2016; StreamNet 2016).

Bull trout spawning is reported to occur in headwater tributaries, and the closest documented spawning stream is Skalkaho Creek (Ladd Knotek, FWP pers. com. July 23, 2015), located over 50 river miles upstream of the action area. Due to bull trout juveniles' propensity to remain in tributary habitats near their spawning grounds, it is unlikely that juveniles would be rearing or present in the action area. Bull trout use of river habitat is limited by a preference for cooler water temperatures and they avoid areas that reach or exceed 15° C (Fraley and Shepard 1989; Bjorn and Reiser 1991). Water temperature data from the Bitterroot River at the closest USGS gage station about 3.5 miles upstream of the project site (USGS station 12352500) indicates that preferred temperature is typically exceeded between July 1 and September 1 most years. As a result, bull trout may seek refuge in cooler tributaries during this time period, which coincides with the typical instream work window for the Bitterroot River from July 1 through September 30.

Bull Trout Critical Habitat

On October 18, 2010, the USFWS issued a final rule designating critical habitat for bull trout in the conterminous United States. The Bitterroot River and O'Brien Creek are included within designated critical habitat for bull trout (Unit 31 Clark Fork River Basin). In freshwater areas, bull trout critical habitat includes the stream channels within the designated stream reaches and a lateral extent as defined by the bankfull elevation on one bank to the bankfull elevation on the opposite bank, or the OHWM if bankfull elevation in not evident on either bank (USFWS 2010a).

Within designated critical habitat, the Primary Constituent Elements (PCEs) for bull trout are those habitat components that are essential for the primary biological needs of foraging, reproducing, rearing of young, dispersal, genetic exchange, or sheltering. It should be noted that the USFWS (and NMFS) have proposed to remove the term "primary constituent elements" from designated critical habitat regulations (50 CFR

424.12) and to return to the statutory term “physical and biological features” (79FR 27066). Considering this proposal is still a draft, the term PCE will be used herein to describe the physical and biological features that define critical habitat for listed species. If the PCE term is removed from critical habitat regulations in the future, the PCEs described herein should be considered the functional equivalent of any new term developed under 81 FR 7214.

At the time of writing, the USFWS (2010a) has determined that nine PCEs are essential for the conservation of bull trout. The nine PCE’s and their occurrence in the action area are identified below.

PCE 1: Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

Development in the areas around the project reach roadways, existing Maclay Bridge, and associated bank rip rap has degraded floodplain function and connectivity and loss of overbank flow maintenance. Much of the surrounding area in the Bitterroot valley is used for agriculture, which relies heavily on irrigation from river water. Some irrigation water might eventually return to the river as groundwater. Based on this condition, the presence of springs, seeps, or groundwater sources or subsurface water connectivity to these water sources is degraded and somewhat lacking in the action area.

PCE 2: Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

There are no physical barriers in the Bitterroot River from its confluence with the Clark Fork River upstream through the project site. High instream temperatures during the summer months of July and August may constitute a thermal barrier to migration and use. Temperature barriers to rearing and migration may be present if stream temperatures exceed 12°C and 15°C (54 to 59 °F**)**, respectively (USFWS 1998a).

PCE 3: An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

This PCE is present and functioning in the action area FMO habitat. Other species of fish described in Section 3.2, including rainbow trout and cutthroat trout, occur in the action area (Knotek 2005) and provide forage fish species for subadult and adult bull trout (FWP 2016). Data on aquatic macroinvertebrates is unavailable, though benthic macroinvertebrates are certainly present to some degree in the action area.

PCE 4: Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.

While present, this PCE is degraded in the action area. The project reach of the Bitterroot River is a single channel at the bridge site and splits to include a side channel downstream of the proposed bridge site. Large woody debris and instream channel habitat structure is lacking. The mouth of O’Brien Creek is located just upstream of the proposed bridge site on the left bank and associated scour pool.

PCE 5: Water temperatures ranging from 2° to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.

This PCE is present, but not properly functioning in the summer months in the action area. The lower Bitterroot River mainstem exhibits high summer temperatures that reach 20 ºC during much of July and August (USGS station 12352500 data). It is unknown to what degree that flow and habitat modification have contributed to these warm thermal regimes, but it is likely that these modifications have warmed the lower river relative to historic conditions. Temperatures during the later fall, winter and spring do not prohibit bull trout use through this reach.

PCE 6: In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.

This PCE is not present in the action area. The action area reach does not support bull trout spawning, possibly attributed to prohibitively high instream temperatures during the September spawning period.

PCE 7: A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.

This PCE is degraded in the action area. Channelization, agriculture and residential development have altered the natural hydrograph of the lower Bitterroot River mainstem. Irrigation withdrawals and runoff influence flow levels in the lower Bitterroot River mainstem and impair the natural hydrograph.

PCE 8: Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

This PCE is impaired in the action area. The Bitterroot subbasin has a number of water quality issues, mostly related to non-point sources of pollutants, alteration of channels, and water withdrawals. Sediment, nutrients, and temperature are three of the most commonly cited water quality issues for the mainstem of the Bitterroot River and some tributary streams. The reach of the Bitterroot River in the project vicinity is on the 303(d) list of impaired waters (DEQ 2014). Temperature, runoff, agriculture, habitat modification, and wet weather discharges in the contributing basin are the primary sources of impairment.

PCE 9: Sufficiently low levels of occurrence of nonnnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

This PCE is impaired in the action area. Brook and rainbow trout, both introduced to the Clark Fork Basin, are present in the action area.

Western Yellow-Billed Cuckoo

Status and Life History

The western population of the yellow-billed cuckoo (*Coccyzus americanus occidentalis*) breeds along river systems west of the Rocky Mountains, which generally separate this population from its counterpart, the eastern yellow-billed cuckoo. Yellow-billed cuckoos breed throughout much of the eastern and central U.S., winter almost entirely in South America east of the Andes, and migrate through Central America. The USFWS identifies yellow-billed cuckoos west of the Continental Divide as a Distinct Population Segment (DPS) for conservation purposes and this DPS has been listed as threatened under the ESA since 2014 (79 FR 59991 60038). The western subspecies has disappeared over much of the western U.S. and now occurs as a rare breeder in California, Arizona, New Mexico, and west Texas.

Throughout their range, preferred breeding habitat includes open woodland with thick undergrowth, parks, and deciduous riparian woodland. In the West, they nest in tall cottonwood riparian stands with willow understory. Nests are found in trees, shrubs or vines, an average of 1 to 3 meters above ground (Harrison 1979) and typically in mature willows (Biosystems Analysis, Inc. 1989). The Western subspecies typically requires patches of at least 10 hectares (25 acres) of dense, riparian forest with a canopy cover of at least 50 percent in both the understory and overstory.

Migration and wintering habitat needs are not well known, although they appear to include a relatively wide variety of conditions. Migrating yellow-billed cuckoos have been found in coastal scrub, second-growth forests and woodlands, hedgerows, forest edges, and in smaller riparian patches than those used for breeding. Caterpillars and other insects, as well as some frogs and lizards, comprise the main diet while fruit and seeds are also eaten, more frequently on wintering grounds.

In the west, much of the riparian habitat preferred by the yellow-billed cuckoo has been converted to farmland and housing, leading to population declines and the possible extirpation of cuckoos from British Columbia, Washington, Oregon, and Nevada. Once common in the California Central Valley, coastal valleys, and riparian habitats east of the Sierra Nevada, habitat loss now constrains the California breeding population to small numbers of birds. As long-distance, nocturnal migrants, yellow-billed cuckoos are also vulnerable to collisions with tall buildings, cell towers, radio antennas, wind turbines, and other structures. Yellow-billed cuckoo populations declined by 1.6 percent per year between 1966 and 2010. The loss and degradation of native riparian habitat throughout the western yellow-billed cuckoo's range have played a major role in the bird's decline.

Occurrence in Action Area

Only eight sightings have been reported in western Montana since 1959. Of these, two sightings have been confirmed near the project vicinity and include (1) a female with an egg in the oviduct found in the Orchard Homes neighborhood in 1980, and (2) a single bird that was photographed at 33 Marshall Street in Missoula in mid-June, 2012, and was potentially seen a few days later along Tower Street (USFWS 2015a). Despite the 1980 and more recent observations, the USFWS does not believe there is a breeding population of yellow-billed cuckoos in western Montana.

Regionally, this species is considered a transient migrant in western Montana (USFWS 2015a). Although limited within the immediate study area, suitable migratory habitat for the species does occur in the Missoula valley along riparian corridors and forested areas upstream and downstream.

Critical Habitat is proposed for this species (79 FR 48547 48652) but does not include any areas in the state of Montana and therefore does not include the project action area.

Potential Impacts on Bull Trout and Bull Trout Critical Habitat

Construction of the project is anticipated to occur within two seasons, with construction of the new bridge occurring in year one and removal of the Maclay Bridge in the second year. Work within the river would be scheduled to occur during the summer in-water work window (July 1 and September 30) when bull trout are least likely to be present.

Potential impacts from the proposed project would be attributed to construction activities for the new South Avenue Bridge and removal of the existing Maclay Bridge. The main components of construction that could impact bull trout are related to noise disturbance, impacts on habitat, and potential for sedimentation or hazardous materials downstream.

Although instream work can have potential for direct mortality of bull trout during construction activities by killing adult or juvenile fish and/or incubating eggs within spawning areas, there is no suitable spawning habitat in the lower Bitterroot River in or near the action area. Therefore no direct mortality of incubating eggs or destruction of redds is anticipated. Instream project activities including pile driving could result in mortality or injury to adult and subadult bull trout. Pile driving could be used for the installation of piers, coffer dams, and pilings associated with work bridges and the new bridge. Although the chance of the project causing direct mortality of individual bull trout is remote due to the extremely low population density, the chance does exist.

Underwater Noise

Construction-generated underwater noise, particularly noise related to impact pile driving, has the potential to injure or kill fish, depending on the duration and magnitude of the noise, and the size of the fish. Impact pile driving creates high sound pressure waves that can result in physical damage including hemorrhage and rupture of the gas-filled internal organs of fish such as swim bladders, eyes, and kidneys (Turnpenny et al. 1994; Popper 2003; Hastings and Popper 2005). Depending on the source of such underwater sound pressure levels, the disturbance can also result in temporary stunning of fish, and alterations in behavior that could potentially affect fish feeding and predator evasion within the vicinity of the pile-driving activity (Turnpenny et al. 1994; Popper 2003; Hastings and Popper 2005).

Based on NMFS noise thresholds for harm and injury, peak noise levels at or above 206 dB may harm fish. Cumulative noise levels above 183 dB are considered to put fish less than 2 grams in size at risk of injury or death, while levels above 187 dB may harm fish greater than 2 grams in size (WSDOT 2015). Fish behavior may be modified at about 150 dB (WSDOT 2015). These noise thresholds for harm and behavioral modification are primarily based upon underwater noise levels produced during impact pile driving. As described above, this impact analysis assumes that impact pile driving would be the

method used to install the bridge piers, although vibratory installation of steel casing and drilled shafts remains a possible method.

Vibratory installation would result in less noise and therefore reduced impacts on fish because generated sound pressures would not approach injury levels for fish larger than 2 grams in size (i.e., the size class of bull trout with greatest potential to be present in action area). Regardless, vibratory installation of piles is typically followed by final proofing using an impact hammer.

If bull trout are present within the immediate study area during pile driving activities, they could be susceptible to mortality or injury. However, installation of the bridge piers, associated cofferdams and work trestles in the river channel would occur within the in-water work window when bull trout would not be expected to be present due to high summer water temperatures as previously described. Further, in the unlikely event that bull trout are present, shallow water during the summer work window in both the Bitterroot River and O'Brien Creek would reduce the propagation of underwater noise impacts. A study on pile driving noise in the Yakima River in Washington concluded that 24 inch steel piles driven with an impact hammer in shallow, flowing water had sound levels inhibited due to the shallow water and did not exceed thresholds that would cause injury or mortality to fish (Laughlin 2005).

Construction activities conducted prior to initiating impact pile driving, including instream excavation and the potential use of vibratory hammers for preliminary pile installation could expose any fish to underwater noise. However, such noises are highly unlikely to produce sound pressure levels that would elicit an avoidance response by fish. Further, as previously described, the potential for bull trout to be present in the action area during the summer in-water work window is remote.

Construction noise associated with Maclay Bridge removal could also expose fish to underwater noise. No blasting is anticipated to be required for the demolition of Maclay Bridge; however, regardless of the contractor method of pier removal, some noise will occur. The piers to be removed at Maclay Bridge are located on vegetated gravel bars and not within the main river channel. In-water construction activities at Maclay Bridge would occur during the in-water work window. Due to construction timing during low flows it is unlikely that fish would be present in the vicinity. Isolation of the work area would further reduce underwater noise and it is highly unlikely that construction noise would produce sound pressure levels that would elicit an avoidance response by fish.

Sedimentation and Turbidity

In-water construction for the installation for the bridge piers, coffer dams, and work trestles, as well as the placement of west bank rip rap would result in sedimentation and turbidity downstream of the proposed crossing. In-water work for removal of the bridge piers for Maclay Bridge would also result in suspended sediment and turbidity downstream of that site. The installation of sheet pile coffer dams would isolate the work areas for pier removal and reduce the amount of sediment introduced into the river during construction and demolition activities.

Bridge deck removal for Maclay Bridge is another potential source of instream disturbance as contractors may not be able to capture and contain all fine materials that could enter the river. This impact is expected to be minor, as the contractor will be required to contain anticipated materials. Section 208 of the MDT *Standard*

Specifications for Road and Bridge Construction specifies the process with which the contractor must comply to prevent and control the siltation of lakes, streams, rivers, ponds, and other wetlands.

Although sedimentation and elevated turbidity can affect fish behavior, physiological processes (e.g., gill function), and prey resources, bull trout are highly unlikely to be present in the action area during the instream work window. Further, no bull trout spawning is known to occur in the vicinity or downstream of the proposed bridge crossing, and spawning habitat is not present in the mainstem reach. Sedimentation and turbidity from in water construction activities would not impact bull trout spawning habitat.

Although bull trout are not expected to be within the action area during in-water construction due to high stream temperatures in the summer, in the unlikely event that any individuals are present, they would be mobile adults or subadults. Such lifestages would be able to move away into adjacent undisturbed areas upstream or downstream and avoid any temporary sediment plumes associated with construction or bridge removal activities.

Increased turbidity and sedimentation downstream of the project could negatively affect benthic macroinvertebrate prey items by altering water quality and/or substrate. However, benthic species are expected to recover rapidly after construction and organisms that occur in the drift, such as mayflies, caddisflies, and midge larvae, would be able to quickly recolonize the affected area (Reid et al.2002). These temporary impacts on the food web would have minimal if any affect on bull trout, which only intermittently occupy the action area as adults that feed on other smaller fish and not typically benthic invertebrates.

Fish Passage and Aquatic Habitat Modification

Construction activities along the river banks and at the piers in mid channel would not fully span the river channel. Therefore, in the unlikely event that bull trout were present, they could pass through the action area unimpeded. Noise and turbidity may deter fish from using the area during construction as described above; however, few, if any, bull trout would be expected in the construction area during the summer work window.

The placement of concrete block or similar structured cofferdams for instream work isolation for the bridge piers would result in modifications to localized channel morphology. The reduction in river habitat available to bull trout in the affected reach and the alteration of local flow patterns would be temporary in nature and, following construction, would be returned to pre-project conditions. However, as previously discussed, with the possible exception of a few transitory adults or subadults, bull trout are highly unlikely to be present during the instream work window, therefore, it is not anticipated that fish salvage would be required in areas to be dewatered for instream work.

The placement of new bridge piers within the river channel would result in minor, localized hydraulic modifications in the action area, and minor modifications to channel morphology. The current design of the proposed bridge includes two pier foundations of approximately 830 square feet each. The size of the piers is small in relation to the river and any hydraulic effects would be expected to dissipate over relatively short distances. Some scour of the river bed is anticipated at higher flows from the proposed piers. Because the action area is primarily utilized as a migratory corridor for bull trout, it is

unlikely that minor localized modifications to hydraulic patterns would affect the ability of bull trout to migrate through the reach and around hardened structures.

Long-term degradation of aquatic habitats could occur if the disturbed stream channel is not restored to a stable and functional condition. For example, modification of stream contours could lead to channel incision and loss of floodplain connection. Erosion of the streambed, banks, or adjacent upland areas could also introduce sediment into the waterbody. Streambank modification and loss of riparian vegetation along the banks could also decrease existing root stock that stabilizes banks. No channel grading is proposed for the bridge project, and bank modifications will largely be avoided. A minor amount of stabilizing rip rap will be placed at the west abutment outside of the main river channel. The east abutment for the new bridge would remain above the OHWM (see Preliminary Bridge Layout Plan in Appendix A). The existing banks in the project footprint are not undercut, and no large woody debris was present during the field visit, and none would need to be removed for the proposed project. The river bank modification is also small, at well below 0.5 acre, compared to available natural banks on both sides of the river upstream and downstream of the project footprint. Impacts on stream habitat would result in insignificant effects on species use of the migratory corridor.

Removal of the existing Maclay Bridge, including bridge piers and abutments, will permanently alter the stream morphology at this location by restoring a normal cross-sectional width for this reach and benefit the floodplain by removing the current restrictive infrastructure. Removal of the Maclay bridge piers would also off-set the loss of river substrate habitat resulting from the installation of the new piers for the proposed bridge.

Riparian Vegetation Removal

Riparian vegetation clearing would be necessary within the project construction footprint of the new bridge as well as a small area of vegetated gravel bar surrounding the piers to be removed at Maclay Bridge. In addition, minor temporary vegetation clearing may be necessary on the east bank at Maclay Bridge to provide equipment access. Riparian vegetation removal could impact bull trout and bull trout critical habitat via loss of instream shading and a reduction of large woody debris. On the west bank at the new bridge site, the project would avoid impacting riparian vegetation around the mouth of O'Brien Creek, but would impact tree cover within the permanent project footprint on the west bank, north of the creek. The permanent footprint is anticipated to remove approximately 0.3 acre of riparian vegetation on the right and left banks immediately adjacent to the Bitterroot River. This would result in a small, localized loss of potential large woody debris input and bank cover, but would be insignificant compared to that available upstream and downstream. Permanent removal of native vegetation would be limited to the extent practicable to construct the project and thus is not anticipated to have a long-term negative impact to overall riparian habitat along the Bitterroot River.

Restoration through planting of riparian species would occur where practicable in disturbed areas adjacent the Bitterroot River following construction of the South Avenue Bridge and removal of Maclay Bridge. The abandoned segments of River Pines Road will be obliterated: asphalt removed, re-graded, and revegetated to provide for developing additional riparian buffer for mitigation between the west roadway approach and O'Brien Creek.

Introduction of Hazardous Materials

Petroleum products and wet concrete are two items that have potential to negatively impact bull trout, in the unlikely event that individuals are present in the action area during in-water work. Potential sources of fuel and oil spills include heavy equipment, portable water pumps, or products stored on site throughout the duration of the project. Specific minimization measures have been established regarding fuel storage, fueling of equipment and spill containment, including provisions for contractor preparation of spill prevention plans. These measures should reduce or eliminate the potential for spill events, and thereby reduce or eliminate any effects on bull trout.

Wet concrete, if placed directly in contact with live stream water, can increase pH and release carbonate, both of which are toxic to fish under certain conditions. Installation of the instream pier would be accomplished in an isolated work area with the use of either a coffer dam to install steel piles or steel casing to install drilled shafts. Installation of either method would isolate the concrete footing and pier from the stream and prevent exposure of the stream to any concrete. Materials excavated from inside the coffer dam work area or drilled shaft casing would not be permitted to enter the river. All water from inside the drilled shaft casing would be required to be pumped to collection areas on the stream bank.

Prior to and during construction, MDT will be required to acquire and comply with various state and federal water quality permits in association with this project. These include a Stormwater Pollution Prevention Plan (SWPPP) to be filed with DEQ and USACE Clean Water Act (404/401) permits and certifications. BMPs as described below in the Recommended Conservation Measures section would be used to prevent runoff or materials from construction of the abutments on each bank from entering the river.

Operation

Operation of the bridge would have minimal impacts as the area is already developed and the proposed bridge would replace the existing Maclay Bridge. The proposed structure has been designed to minimize any need for future in-water maintenance activities.

The new bridge will be designed to prevent stormwater runoff, including deicing chemicals, and road debris from directly entering the Bitterroot River. Deck drains will be required on the new bridge but will be located so no runoff drains directly into the river, and stormwater will be conveyed to areas inland of each bank for natural infiltration. The current approach is to convey stormwater from the bridge away from the active river channel and dispense onto the east overbank. Specific stormwater facilities have not been determined at the current level of design but will take floodplain inundation into consideration and would avoid impacts from stormwater on O’Brien Creek through protective vegetated buffers and grading restored areas to slope away from O’Brien Creek where possible.

The piers for the proposed bridge will be designed to incorporate scour protection and stream function is anticipated to remain unchanged for sediment transport capacity, channel stability, and width-to-depth ratio. The proposed project should not have any long-term effects on water quality and long-term stream function or hydrology, nor will it deter fish such as bull trout from returning to this reach of the river once the project and all construction activities are complete.

Impacts to Bull Trout Critical Habitat

Impacts on each of the PCEs from the construction and operation of the proposed project and demolition of Maclay Bridge on bull trout critical habitat have been previously described. The project would have no effect on PCE 1 because installation of the new bridge piers and removal of Maclay Bridge would not alter groundwater sources or hyporheic flows or connectivity to these water sources. PCE 2 would also not be affected by the project as migratory passage would be maintained, including during construction since coffer dams and pier footprints do not span the river and upstream and downstream passage would be maintained throughout.

PCE 3 could be minimally impacted during construction of the instream piers, and pier removal at the existing bridge from temporary loss of macroinvertebrate habitat. These impacts would be temporary and minimal due to lack of juvenile bull trout rearing in the area, and areas of the streambed that would be impacted are small relative to the size of the river in the action area. Potential minor impacts to PCE 4 could also occur due to minor alteration of the existing riverbed at the pier sites, and bank alterations at Maclay Bridge. Complex river habitat including pools and large woody debris, however, is lacking in the action area and impact on these features is not anticipated.

Bridge construction and removal of Maclay Bridge would cause temporary turbidity during instream construction activities, notably during coffer dam installation and removal as described above. This would produce minor, temporary impacts to PCE 8 in terms of water quality, but water quantity would not be affected.

The project would have no effect on PCEs 5, 6, and 7 since the flows and temperatures in the river would not be altered due to construction or operation of the project, and no bull trout spawning or rearing occurs in the action area. The project would also have no impacts on PCE 9, as the fish species composition in the action area would not be altered and competing or predatory species abundance would not be promoted.

Potential Impacts on the Yellow-Billed Cuckoo

Potential impacts on the yellow-billed cuckoo would be restricted to disturbance due to in-air noise from construction activities and removal of riparian vegetation. Potential migratory habitat for yellow-billed cuckoos occurs in the action area, and consequently there is the potential for a yellow-billed cuckoo to transit the area during construction in summer months. In-air noise from construction activities could affect yellow-billed cuckoo if present in the action area. If encountered, the bird may be flushed from the area and move to roosting habitat elsewhere.

Loss of riparian vegetation, particularly trees, could impact potential resting areas for migrating yellow-billed cuckoo individuals. Riparian vegetation that may provide migratory habitat would be minimally affected by construction activities. Existing riparian vegetation within the study area is limited and has previously been altered and cleared for agriculture, roads and residential development. Riparian vegetation in the general location of the proposed alignment is comprised of a narrow band of second-growth to mature black cottonwood, balsam poplar, weeping willow, and redosier dogwood. The trees along the east bank of the river occur in a narrow strip between the river and open pasture.

The project would avoid impacting riparian vegetation around the mouth of O'Brien Creek, but would impact tree cover within the permanent project footprint on the west bank, north of the creek. The permanent footprint is anticipated to remove approximately 0.3 acre of riparian vegetation on the right and left banks immediately adjacent to the Bitterroot River. Permanent removal of native vegetation would be limited to the extent practicable to construct the project and thus is not anticipated to have a long-term negative impact to overall riparian habitat along the Bitterroot River.

Restoration through planting of riparian species would occur where practicable in disturbed areas adjacent the Bitterroot River following construction of the South Avenue Bridge and removal of Maclay Bridge. At the Maclay Bridge site, existing rip rap would be reinstalled following bridge abutment removal and instream habitat would be improved through vegetation restoration. The abandoned segments of River Pines Road will be obliterated: asphalt removed, re-graded, and revegetated to provide for developing additional riparian buffer for mitigation between the west roadway approach and O'Brien Creek.

Preliminary Determination of Effect for Threatened or Endangered Species

Canada Lynx, Grizzly Bear, Red Knot, and Water Howellia

As previously noted, these federally-listed threatened species have documented occurrences within Missoula County; however, there is no suitable habitat for these species in the action area. Critical habitat for the Canada lynx is designated within northwestern Montana but is outside the action area. For these reasons, the project will have ***no effect*** on the Canada lynx, grizzly bear, red knot, and water howellia, and ***no effect*** on Canada lynx critical habitat.

Bull Trout

The reach of the Bitterroot River within the action area is used as a migratory corridor by adult and subadult bull trout moving between spawning habitats in upstream tributaries. Warm water temperatures in summer months most likely preclude bull trout from the project reach during late summer. Although occurrence of bull trout is low and not year round, there is the potential for individuals to be present within the project action area. For this reason the preliminary effect determination is that the project ***may affect*** bull trout.

Although the project reach of the Bitterroot River is designated as critical habitat for bull trout, the project reach is intermittently used as a migratory corridor. Due to the relatively small footprint of the project on the river and riverbanks, and the removal of the existing Maclay Bridge, the effects of the project on critical habitat would likely be limited to temporary degradations to water quality. Because the project would take place in bull trout critical habitat, regardless of the level of impact on PCEs in the action area, the project ***may affect*** bull trout critical habitat.

For both bull trout and designated bull trout critical habitat, a final Determination of Effect will be made at a later phase in project development in coordination/consultation with the USFWS.

Yellow-Billed Cuckoo

Although the presence of yellow-billed cuckoo in the action area is rare and highly unlikely (as previously described), the occurrence of a migrating individual cannot be completely discounted. Because suitable migratory habitat is present in the action area, the possibility exists that a transient bird may be present during construction activities in summertime months. For this preliminary assessment, it is determined that the project ***may affect*** yellow billed cuckoo. A final determination of effect will be made at a later phase in project development in coordination/consultation with the USFWS.

Preliminary Determination of Effect For Proposed or Candidate Species

The wolverine is a proposed species with potential to occur in Missoula County. The potential occurrence within the project area vicinity, however, is extremely low due to the species' habitat preference for higher elevations and large, roadless areas. The project area lacks suitable wolverine habitat. The whitebark pine is a candidate species that occurs in Missoula County. This species inhabits higher elevation forested areas well outside the project action area, which is in the lower elevation Bitterroot valley. Due to lack of occurrence and suitable habitat for these species in the project action area, the proposed project ***is not likely to jeopardize the continued existence*** of whitebark pine or wolverine.

Potential Cumulative Effects Analysis

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this preliminary biological assessment (USFWS 1998b). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA (USFWS 1998b). A cumulative impacts analysis examines the additive effect of the proposed action's residual impact (i.e., impacts remaining after applying avoidance and minimization Measures) in relation to the residual impacts generated by past, present, and reasonably foreseeable actions within the cumulative analysis area.

Residual impacts resulting from the proposed project include minor habitat loss for yellow-billed cuckoo and short-term degradation of water quality in bull trout critical habitat. Other ongoing actions occurring in the cumulative analysis area that could influence habitat include private parcel development. Other ongoing actions occurring in the cumulative analysis area that could influence water quality include ongoing off-system road maintenance administered by the state and county, agricultural and grazing activities on rural properties in the vicinity, and ongoing private development introducing additional impervious surfaces that may increase runoff.

The Fort Missoula Regional Park is a large-scale new park being constructed on the south side of South Avenue, approximately 1.5 miles east of the proposed project. The first phase of construction, which focuses on the western side of Fort Missoula, is anticipated for completion in September 2016, and includes new sport fields, park amenities, and open space areas constructed on a former vacant gravel pit. The second phase includes redevelopment of existing ball fields on the eastern side of Fort Missoula.

Effects from the regional park are not anticipated to negatively impact habitat or water quality.

No additional future federal, state, local, or private actions of regional significance that are reasonably certain to occur have been identified within the vicinity of the proposed project. Future projects occurring on or adjacent to the Bitterroot River, the nearby Clark Fork River, or their tributaries also designated as bull trout critical habitat could result in additional temporary impacts on bull trout and its critical habitat. No long-term cumulative impacts are anticipated.

Recommended Conservation Measures

To minimize and avoid impacts to bull trout, the following language for conservation measures will be incorporated into the construction design and special provisions:

1. To minimize impacts to overwintering and migrating bull trout, impact pile driving for the construction of temporary and permanent facilities that has not been attenuated for noise will occur between July 1 and September 30. This work window includes dry land and in-water impact pile driving.
2. To minimize the risk of barotraumas and fish mortality from driving piles for construction of the new bridge and any temporary work bridges outside the above time period:
    a. Use a vibratory hammer to drive piles to such point when an impact hammer will be required to drive the pile to the point of refusal OR;
    b. Initiate impact hammer pile-driving of each pile with lower hammer strokes than are required for the initial six strikes to encourage fish to vacate the surrounding area, and use the National Marine Fisheries Service Stationary Fish SEL Calculator Tool to determine how many pile strikes can occur during a day, based on pile type and size, prior to the thresholds being attained. Once the number of strikes has been attained, impact pile driving must be stopped for the day. If driving pile with an impact hammer over consecutive days, do not drive piling between the hours of 9:00 PM and 6:00 AM. OR:
    c. Use MDT-approved noise reduction methods, such as those offered in Leslie and Schwertner (2013) (e.g., bubble curtains, coffer dams) AND:
    d. Conduct hydroacoustic monitoring. Through hydroacoustic monitoring, should it be determined that the physical harm thresholds of the peak sound pressure level (SPL) of 206 dB (re: 1 µPa), or the cumulative sound exposure level (SEL) of 187 dB (re: 1 µPa) for fish > 2 g, or 183 dB (re: 1 µPa) for fish < 2 g have been attained or exceeded, impact pile driving must be stopped for the day, with impact pile driving permitted to commence the next morning.
3. To the maximum extent possible, disassemble the existing bridge and remove without pieces being allowed to fall into the stream. If portions of the old bridge do fall into the stream during demolition, they will be removed from the stream without dragging the material along the streambed, and will be removed within two days. No blasting is anticipated to be required for the demolition of Maclay Bridge.

4. Instream work conducted within the channel shall be kept to the minimum amount necessary, and within the in-water work window. This includes, but is not limited to, construction and removal of any coffer dams that may be needed for the driving and removal of pilings for any temporary support structures that may be necessary and riprap placement below the ordinary high water mark. Instream construction work shall be completed in the shortest amount of time possible.
5. Any temporary work or detour bridges necessary at these crossings should clear span the stream channel, if possible. No construction equipment would be allowed to operate within the active channel of any stream unless permitted to do so.
6. Do not allow materials excavated from inside any dewatering structures to enter any stream.
7. Ensure best management practices for erosion control are applied to this project, including, but not limited to:
    a. Install and maintain appropriate BMPs to prevent erosion and sediment transport;
    b. Reseed and revegetate all disturbed areas with desirable vegetation;
    c. Stabilize disturbed channel banks using appropriate BMPs; and
    d. Conduct work to minimize disturbance to riparian vegetation.
8. Collect and dispose of all waste fuels, lubricating fluids, herbicides, and other chemicals in accordance with all applicable laws, rules and regulations to ensure no adverse environmental impacts will occur. Inspect construction equipment daily to ensure hydraulic, fuel and lubrication systems are in good condition and free of leaks to prevent these materials from entering any stream. Locate vehicle servicing and refueling areas, fuel storage areas, and construction staging and materials storage areas to ensure that spilled fluids or stored materials do not enter any stream.
9. Structures designed to minimize sediment and pollutant runoff from sensitive areas such as settling ponds, vehicle and fuel storage areas, hazardous materials storage sites, erosion control structures, and coffer dams should be visually monitored daily, especially following precipitation events, to ensure these structures are functioning properly.
10. Monitor all dewatering activities visually to ensure bull trout are not trapped. In the unlikely event a bull trout is found within a dewatering area, return it immediately to the stream.
11. Any detention basin outlets will be designed such that they are stabilized to prevent streambank erosion and will not otherwise impact the stream channel bank.
12. The contractor will dispose of drill cuttings in areas in a manner which will not adversely affect federally listed species and/or designated critical habitat. Barge debris will be captured and/or contained to prevent material from entering the channel.
13. Upon locating dead, injured, or sick bull trout, notify the Missoula County Project Manager and contract the USFWS Field Office at (406) 449-5225 within 24 hours. Record information relative to the date, time, and location of dead or injured bull trout

when/if found. Include any activities that were occurring at the location and time of injury and/or death of each fish and provide this information to the USFWS.

To minimize impacts on yellow-billed cuckoo, the following language for conservation measures will be incorporated into the construction design and special provisions (USFWS 2015a):

1. Adjust project timing to avoid disruption of individual yellow-billed cuckoos within riparian areas from June 1 through July 31. This would be accomplished by adhering to the MBTA vegetation removal special provision (see Section 2.3.2) that requires clearing of trees and shrubs to occur between August 16 and April 15.
2. Minimize the removal of yellow-billed cuckoo habitat, typically riparian vegetation.
3. Replace/replant removed riparian vegetation.

Additional conservation measures, or revisions to the aforementioned conservation measures, may be developed as project design progresses and pending further resource agency consultation. Special provisions will be developed and included in the contract documents to minimize project effects to the bull trout and bull trout critical habitat and yellow-billed cuckoo.

6 References

Audubon Society. 2016. Guide to North American Birds. Information for Red Knot. <http://www.audubon.org/field-guide/bird/red-knot>. Accessed December 15, 2016.

Bjornn, T.C., and D.W. Reiser. 1991. Habitat Requirements of Salmonids in Streams. From W.R. Meehan, ed. Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. American Fisheries Society Special Publication. 19:83-138.

Biosystems Analysis, Inc. 1989. Endangered Species Alert Program Manual: Species Accounts and Procedures. Southern California Edison Environmental Affairs Division.

Brenkman, S.J., and S.C. Corbett. 2005. Extent of anadromy in bull trout and implications for conservation of a threatened species. North American Journal of Fisheries Management 25:1073 1081.

Brown, R.S. and W.C. Mackay. 1995. Fall and winter movements of and habitat use by cutthroat trout in the Ram River, Alberta. Transactions of the American Fisheries Society 124(6): 873-885.

Cavender, T.M. 1978. Taxonomy and distribution of the bull trout, Salvelinus confluentus (Suckley), from the American Northwest. California Fish and Game 64:139-174.

Cowardin, L.M., V. Carter, F.C. Golet, E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. U.S. Fish and Wildlife Service: Washington, D.C.

DEQ (Montana Department of Environmental Quality). 2016. Clean Water Act Information Center (CWAIC). Accessed at < http://svc.mt.gov/deq/dst/#/app/cwaic>. Accessed on June 23, 2016.

Downs, C.C., D. Horan, E. Morgan-Harris, and R. Jakubowski. 2006. Spawning demographics and juvenile dispersal of an adfluvial bull trout population in Trestle Creek, Idaho. North American Journal of Fisheries Management 26:190-200.

Environmental Laboratory. 1987. Corps of Engineers wetland delineation manual. Wetlands Research Program Technical Report Y-87-1. Department of the Army. Vicksburg, Mississippi.

Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 20+ vols. New York and Oxford.

Fraley, J.J., and B.B. Shepard. 1989. Life history, ecology, and subpopulation status of migratory bull trout (Salvelinus confluentus) in the Flathead Lake and River system, Montana. Northwest Science 63:133-143.

FWP (Montana Fish, Wildlife and Parks). 2016. Montana Fisheries Information System (MFISH). Fish Distribution Data for Bitterroot River. Accessed at <http://fwp.mt.gov/fishing/mFish/newSearch.html>. Accessed on May 16, 2016.

FWP. 2015. Personal email communication between Ladd Knotek (FWP) and Greg Robertson (Missoula County). November 24, 2015.

FWP. 2015. Personal communication between Ladd Knotek (FWP) and Becky Holloway (HDR). July 23, 2015.

Glaser, David. 2000. Restoring O'Brien Creek. *Theses, Dissertations, Professional Papers*. Paper 4721.

Harrison, H.H. 1979. A field guide to western birds nests. Houghton Mifflin Company, Boston, MA. 279 pp.

Hastings, M. C. and A. N. Popper, 2005. Effects of Sound on Fish, prepared by Jones & Stokes, Sacramento, CA, for California Department of Transportation, Sacramento, CA.

Hendricks, P., S. Lenard, C. Currier, and J. Johnson. 2005. Bat use of highway bridges in southcentral Montana. Report to Montana Department of Transportation. Montana Natural Heritage Program, Helena. 31 pp.

Knotek, L. 2005. Middle Clark Fork River and Missoula Area 2004 Fisheries Status Report. Montana Fish, Wildlife & Parks. Missoula, Montana.

Laughlin, J. 2005. Underwater Sound Levels Associated With Pile Driving on the SR 24,I-82 to Keys Road Project – Yakima River. Washington State Department of Transportation Office of Air Quality and Noise, Seattle, WA.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X

Maxell, B. 2016. Personal communication between Bryce Maxell, MNHP, and Jon Schick, HDR Engineering. May 5, 2016.

McPhail, J.D., and J.S. Baxter. 1996. A review of bull trout (Salvelinus confluentus) life-history and habitat use in relation to compensation and improvement opportunities. Department of Zoology, University of British Columbia, Vancouver, British Columbia. Fisheries Management Report No. 104.

Missoula County Community & Planning Services. 2016. Missoula County Parks, Trails, & Open Lands Program interactive web map. Accessed at <http://gis.missoulacounty.us/CAPS/ParksAndTrails/>. Accessed on July 13, 2016.

Missoula County Weed District. 2016. Weed Management Areas: Blue Mountain-Target Range. Accessed at <http://www.missoulaeduplace.org/blue-mountain-target-range.html>. Accessed on May 4, 2016.

Montana Bald Eagle Working Group. 2010. Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan, 1994, Montana Fish, Wildlife and Parks, Helena, Montana.

Montana Bull Trout Scientific Group (MBTSG). 1998. The relationship between land management activities and habitat requirements of bull trout. Prepared for: the Montana Bull Trout Restoration Team. Helena, MT. 77pp.

Montana Department of Agriculture. 2015. Montana Noxious Weed Program. Montana Noxious Weed List (2015). Accessed at <http://agr.mt.gov/agr/Programs/Weeds/PDF/2015WeedList.pdf>. Accessed on October 16, 2015.

MDT (Montana Department of Transportation). 2008. Montana Wetland Assessment Methodology. Prepared by PBS&J for MDT. March 2008.

MNHP (Montana Natural Heritage Program). 2016a. Montana Landcover Framework (file geodatabase). Montana Natural Resource information System. Montana State Library. Downloaded March 2016.

MNHP. 2016b. Montana Point Observations Export for Sections 26, 27, 34, 35,Township 13 N, Range 20 W. Accessed at <http://mtnhp.org/mapviewer/?t=1>. Accessed May 4, 2016.

MNHP. 2016c. Water Howellia – Howellia aquatilis. Accessed at <http://fieldguide.mt.gov/speciesDetail.aspx?elcode=PDCAM0A010>. Accessed on July 18, 2016.

MNHP. 2016d. Westslope Cutthroat Trout - Oncorhynchus clarkii lewisi. Accessed at <http://fieldguide.mt.gov/speciesDetail.aspx?elcode=AFCHA02088>. Accessed on September 6, 2016.

MNHP. 2016e. Wolverine – Gulo gulo. Accessed at < http://fieldguide.mt.gov/speciesDetail.aspx?elcode=AMAJF03010>. Accesses on November 7, 2016.

MNHP. 2016f. Montana Field Guides. Species information for Red Knot – Calidris canutus. <http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ABNNF11020>. Accessed on Dec. 12, 2016.

MTNHP. 2016g. Natural Heritage Map Viewer. Generalized Observations for Red Knot. <http://mtnhp.org/mapviewer/?t=7>. Accessed December 15, 2016.

MNHP. 2015. Montana Species of Concern Geographic Information Systems database query. Obtained September 15, 2015.

MNHP. 2014. Montana Wetlands and Riparian Framework. Downloaded February 2014.

MSL (Montana State Library). 2016. Montana Cadastral Mapping Project. Accessed at <http://svc.mt.gov/msl/mtcadastral/>. Accessed on July 13, 2016.

NPCC (Northwest Power and Conservation Council). 2009. Bitterroot River Subbasin Plan. In Columbia River Basin Fish and Wildlife Program. Portland, Oregon, 2009.

NOAA (National Oceanic and Atmospheric Administration). 2016. NOAA Fisheries. Endangered and Threatened Marine Species under NMFS' Jurisdiction. Accessed at < http://www.nmfs.noaa.gov/pr/species/esa/listed.htm>. Accessed on October 6, 2016.

Popper, A. N., 2003. “Effects of Anthropogenic Sounds of Fishes,” Fisheries, Vol. 28, No. 10, pp. 24–31.

Reel S., L. Schassberger, and W. Ruediger. 1989. Caring for Our Natural Community: Region 1 – Threatened, Endangered & Sensitive Species Program. Prepared for the U.S. Forest Service, Northern Region, Missoula, MT.

Reid, S.M., S. Stoklosar, S. Metikosh, J. Evans, and T. Huffman 2002. Effects of Natural Gas Pipeline Water Crossing Replacement on the Benthic Invertebrate and Fish Communities of Big Darby Creek, Ohio. In Environmental Concerns in Rights-of-Way Management. Seventh

International Symposium. J.W. Goodrich-Mahoney, D.F. Mutrie, and C.A. Build (eds.). Elsevier Science, Ltd. cited in 2.2 & 3.2

Ruediger, B., J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, and A. Williamson. 2000. Canada lynx conservation assessment and strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication #R1-00-53, Missoula, MT. 142 pp.

Rieman, B.E., and J.D. McIntyre. 1993. Demographic and habitat requirements for conservation of bull trout. General Technical Report INT-302. U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, Utah.

Smith, H. J., and J. S. Stevenson. 2015. Best Management Practices for Bat Species Inhabiting Transportation Infrastructure. February 2015.

StreamNet GIS Data. 2016. Metadata for Pacific Northwest salmonid and critical habitat distribution. Portland (OR) : http://www.streamnet.org/online-data/GISData.html (Accessed August 2016).

Turnpenny, A., K. P. Thatcher, R. Wood, and J. Nedwell, 1994. The Effects on Fish and Other Marine Animals of High-Level Underwater Sound, Report FRR 127/94, prepared by Fawley Aquatic Research Laboratory, Ltd., Marine and Freshwater Biology Unit, Southampton, United Kingdom.

USACE. 2013. USACE Omaha District Montana Stream Mitigation Procedure. February 2013. http://www.nwo.usace.army.mil/Portals/23/docs/regulatory/MT/Mitigation/MTSMP-Revised-February%202013.pdf

USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region. May 2010.

USACE. 2005. Regulatory Guidance Letter: Ordinary High Water Mark Identification. http://www.usace.army.mil/Portals/2/docs/civilworks/RGLS/rgl05-05.pdf. December 7, 2005.

USDA NRCS (U.S. Department of Agriculture Natural Resources Conservation Service). 2016a. Major Land Resource Regions Custom Report for Missoula County, Montana. March 3, 2016.

USDA NRCS. 2016b. USDA Field Office Climate Data for Missoula International Airport, Montana. http://agacis.rcc-acis.org/30111/wets/results. Created May 16, 2016.

USDA NRCS. 2010. Field Indicators of Hydric Soils in the United States, Version 7.0. G.W. Hurt and L.M. Vasilas (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

USEPA (US Environmental Protection Agency). 2012. Level IV Ecoregions of Montana GIS shapefile. Published 2012. http://archive.epa.gov/wed/ecoregions/web/html/mt_eco.html.

USFWS (U.S. Fish and Wildlife Service). 2016a. Montana Ecological Field Office Endangered, Threatened, Proposed and Candidate Species by Montana County. Published November 25, 2016. <http://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species/countylist.pdf>. Accessed on December 7, 2016.

USFWS. 2016b. Endangered Species information regarding grizzly bear. Mountain Prairie Region. Accessed at <https://www.fws.gov/mountain-prairie/es/grizzlyBear.php>. Accessed on July 18, 2016.

USFWS. 2015a. Personal email communication between Mike McGrath, USFWS, and Becky Holloway, HDR. August 12, 2015.

USFWS. 2015b. Recovery plan for the coterminous United States population of bull trout (Salvelinus confluentus). Portland, Oregon. xii + 179 pages.

USFWS. 2014. Department of the Interior, Fish and Wildlife Service. Federal Register Documents. 79 FR 73705 73748. Volume 79, No. 238. Published December 11, 2014.

USFWS. 2013. Department of the Interior, Fish and Wildlife Service. Federal Register Documents. 78 FR 7863 7890. Volume 78, No. 23. Published February 4, 2013.

USFWS. 2010a. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for Bull Trout in the Coterminous United States, Final Rule. FR Vol. 75, No.200: 63898- 64069.

USFWS. 2010b. Biological Effects of Sediment on Bull Trout and Their Habitat – Guidance for Evaluating Effects, prepared by U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office, Lacey, WA.

USFWS. 2002. Chapter 3, Clark Fork River Recovery Unit, Montana, Idaho, and Washington. 285 p. U.S. Fish and Wildlife Service. Bull Trout (*Salvelinus confluentus*) Draft Recovery Plan. Portland, Oregon.

USFWS. 1998a. Determination of Threatened Status for the Klamath River and Columbia River Distinct Population Segments of Bull Trout. Federal Register 63(111):31647.

USFWS. 1998b. Endangered Species Consultation Handbook. Procedures For Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act. March 1998.

USGS (U.S. Geological Survey). 2014. USGS National Hydrography Database (NHD) Montana Spatial Data Infrastructure (MSDI) geospatial data. Montana Natural Resource information System. Montana State Library. Downloaded September 2014.

WSDOT (Washington State Department of Transportation). 2015. Biological Assessment Preparation for Transportation Projects - Advanced Training Manual. Version 2015

Woods, Alan J., Omernik, James, M., Nesser, John A., Shelden, J., Comstock, J.A., Azevedo, Sandra H., 2002, Ecoregions of Montana, 2nd edition (color poster with map, descriptive text, summary tables, and photographs). Map scale 1:1,500,000.

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APPENDIX A:

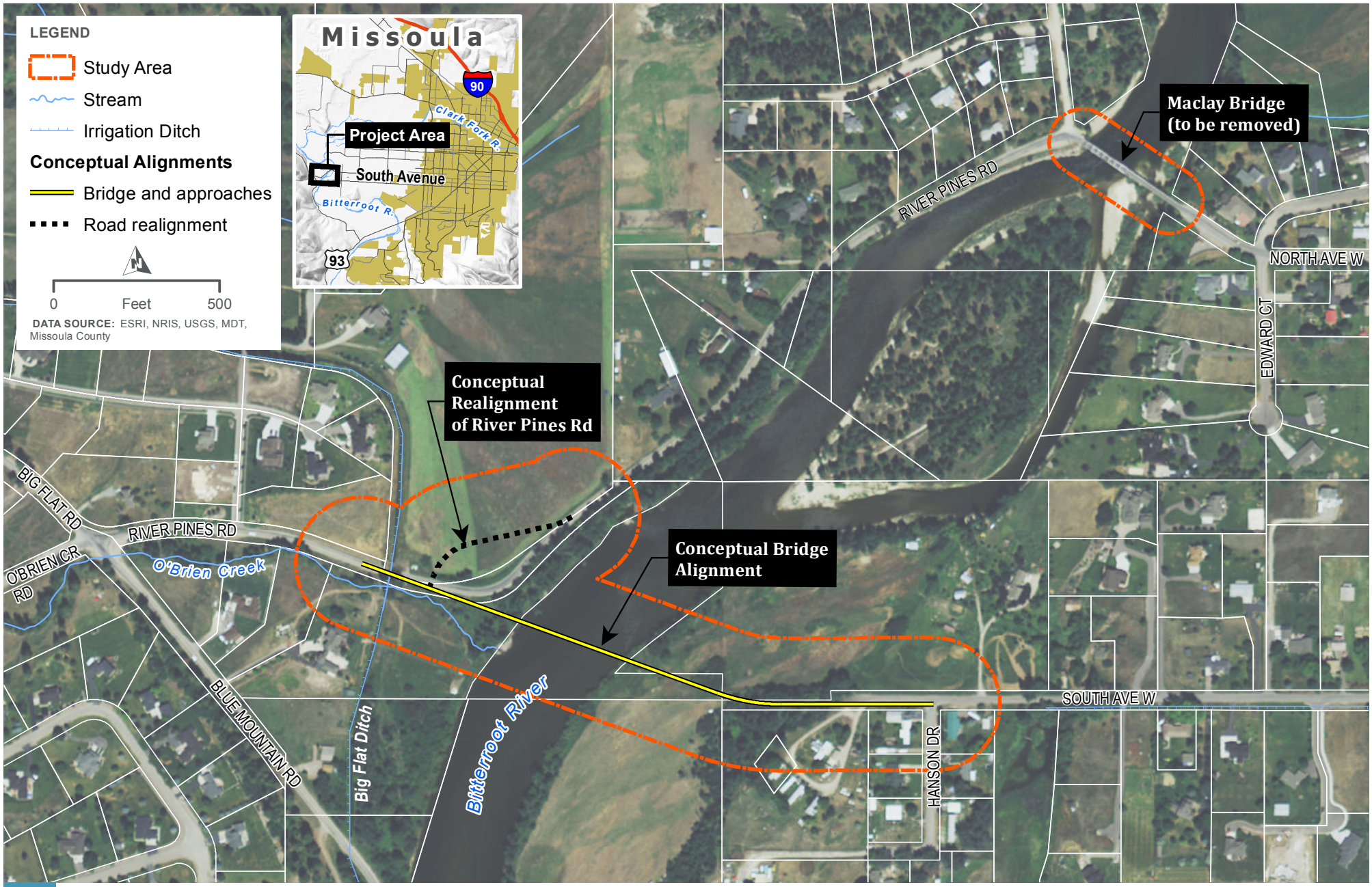
Project Location Map

USGS Topographic Map

Maclay Bridge Study Area Map

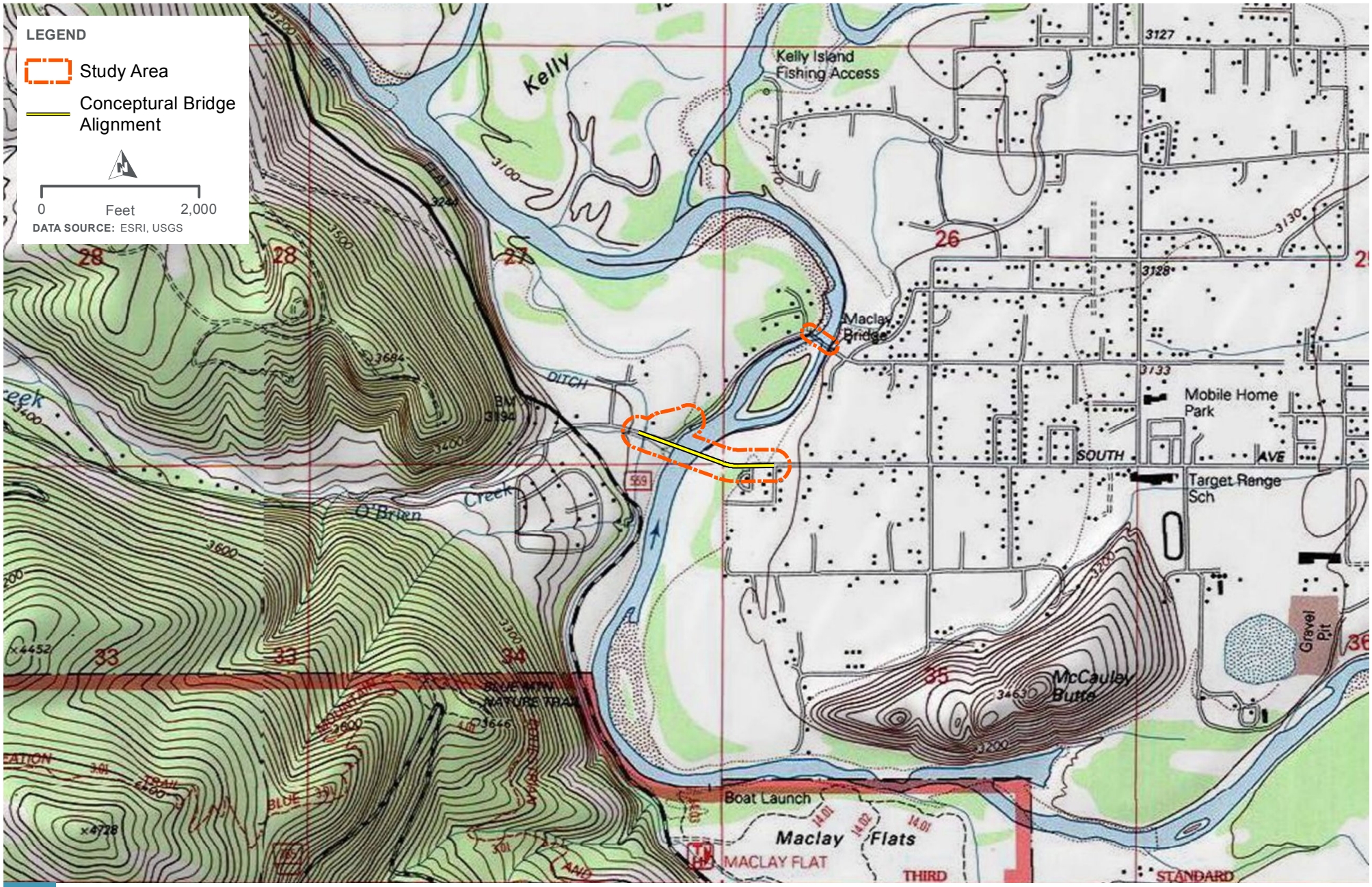
Preliminary Bridge Layout Plan

Preliminary Maclay Bridge Removal Plan



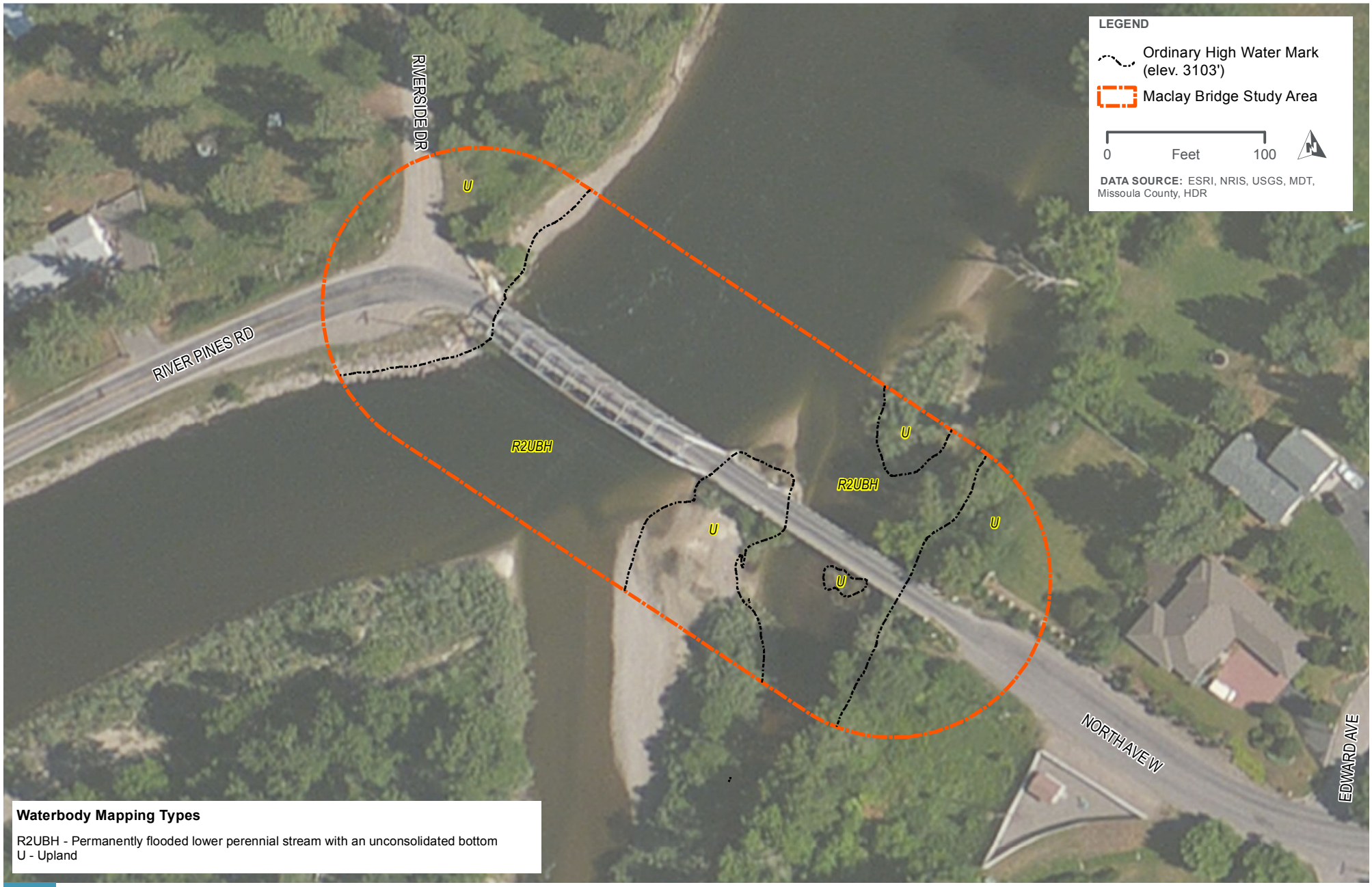
PROJECT AREA

SOUTH AVENUE BRIDGE PROJECT



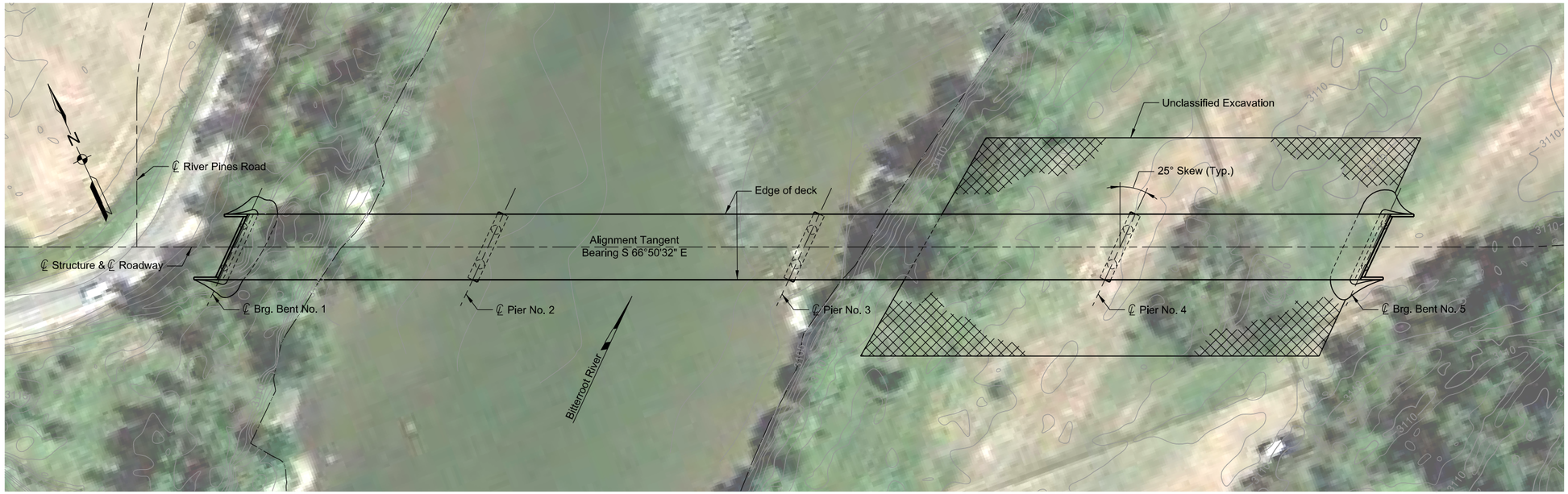
PROJECT AREA TOPOGRAPHIC MAP

SOUTH AVENUE BRIDGE PROJECT



MACLAY BRIDGE STUDY AREA

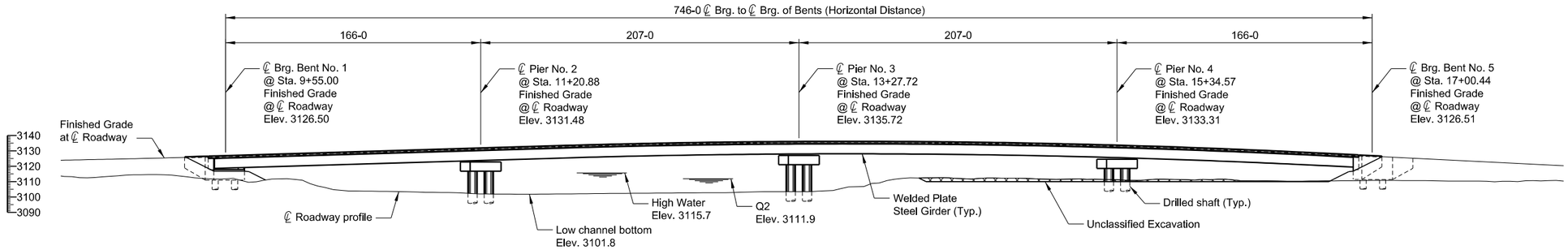
SOUTH AVENUE BRIDGE PROJECT



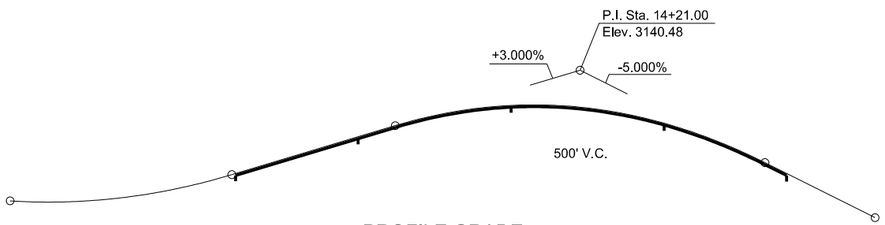
PLAN

STREAM DATA

Drift:	High
Pier Scour (Q100):	12.0'
Contraction Scour (Q100):	0.0'
Ice:	Yes
Drainage Area:	2,855 sq. mi.
2-year Stage (Q2):	3111.9
Base Flood Flow (Q100):	31,800 cfs
Base Flood Stage:	3115.7
Base Flood Velocity:	4.8 fps
Low Beam Elevation:	3118.22



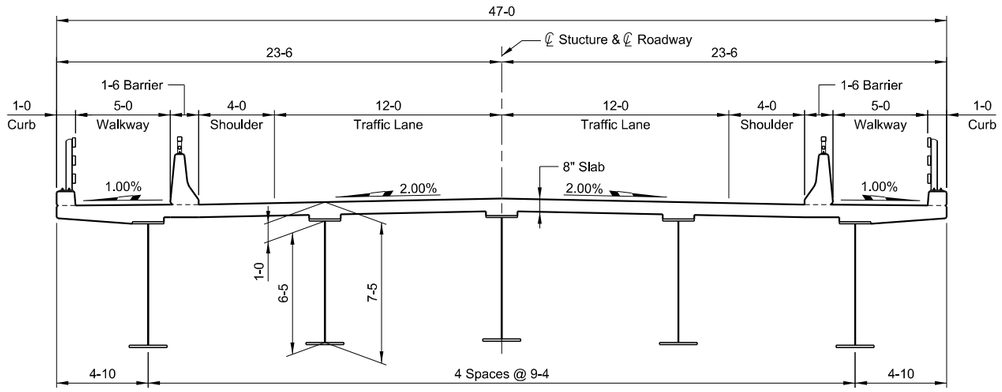
ELEVATION



PROFILE GRADE
No Scale

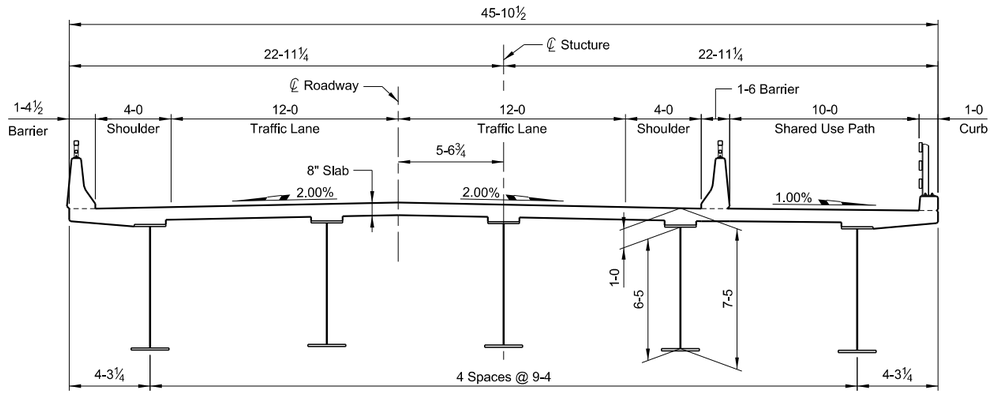
PRELIMINARY

SOUTH AVENUE BRIDGE
OVER BITTERROOT RIVER
TYPE SIZE AND LOCATION STUDY
ALTERNATE 1B PLAN & ELEVATION
JULY 2016
Scale 1" = 80'-0"



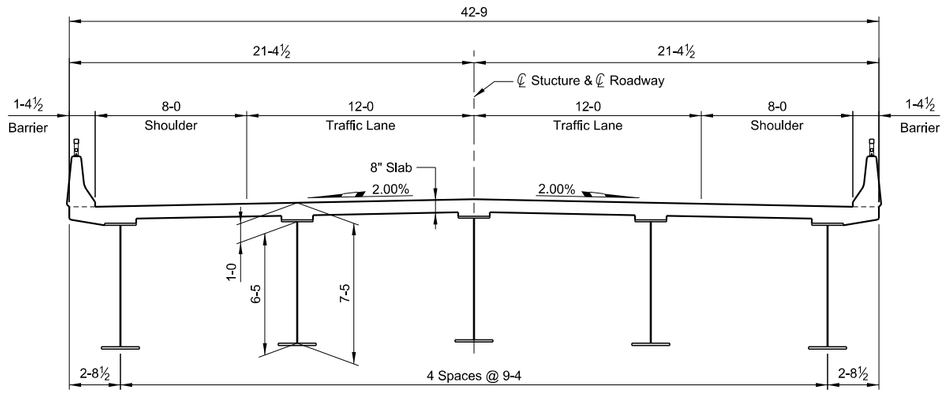
SECTION WITH FIVE FOOT WALKWAYS

(Looking Ahead on Line)



SECTION WITH TEN FOOT SHARED USE PATH

(Looking Ahead on Line)



SECTION

(Looking Ahead on Line)

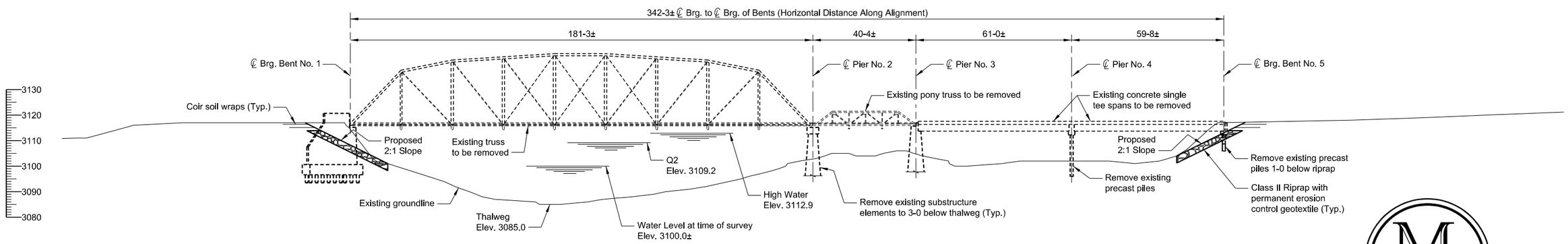
HDR

PRELIMINARY

MC

SOUTH AVENUE BRIDGE
OVER BITTERROOT RIVER
TYPE SIZE AND LOCATION STUDY
ALTERNATE 1B DECK OPTIONS
JULY 2016
Scale ⅛" = 1'-0"

PLAN



ELEVATION

PRELIMINARY

MACLAY BRIDGE REMOVAL AND RIVER BANK RESTORATION

JULY 2016

Scale 1" = 40'-0"

APPENDIX B: Agency Coordination and Communication

From: McGrath, Mike <mike_mcgrath@fws.gov>
Sent: Tuesday, September 01, 2015 4:07 PM
To: Holloway, Becky E.
Cc: Joe Weigand; Schick, Jon; Bill Semmens; Ben Conard
Subject: Re: FW: Bull Trout in Bitterroot River at Maclay Bridge crossing--Response to YBC questions

Becky,

Great questions on the yellow-billed cuckoo (YBC)! I'll do my best to answer them in the order that they were presented. First, I want to clarify the Service's concern for the species in the vicinity of the project area. As mentioned in my August 12th email, since 1959, there have been only 8 observations of the species in western Montana, with a quarter of those observations (n=2) occurring in the nearby vicinity of the project. Thus, we want to ensure the species receives proper consideration. Second, without documented nesting in western Montana, the YBC is generally regarded as a transient migrant. Therefore, we are currently more focused on migratory habitat for the YBC in western Montana than typical nesting habitat. For these reasons, we are recommending that the Montana Department of Transportation and the Federal Highway Administration conduct protocol surveys for the YBC.

Regarding your specific questions:

1. What part of the "proposed action" would trigger YBC playback surveys?

    a. Does this reference construction/operational noise disturbance that would reach potentially suitable breeding/rearing and/or general migratory habitat during the nesting season?

    b. Or direct alteration of such habitat during construction?

    c. Or both?

    While it would be good to know the amount and location of potentially suitable breeding/rearing habitat within the action area, we are concerned with the effects of construction/operational noise disturbance on migratory habitat, as well as direct alteration of both habitat types during construction.

    d. We are unclear what, specifically, would trigger the recommendation for these surveys -

i. While we agree that a habitat survey is warranted for the area to be affected (both by noise and direct alteration) to determine Suitable Habitat (SH) for YBC, a survey for species presence is not warranted until SH is determined, and construction effects are known. In past ESA efforts where bird occurrence has been infrequently documented, and breeding is unlikely, species surveys have not been required unless the goal of the ESA consultation was to achieve a No Effect call. To that end…

2. What is the goal of a survey?

The goal of the surveys is to determine species presence/absence. Without conducting protocol surveys, we must assume species presence. Looking at an aerial photo of the potential action area, I recognize that the potential habitat patches are small in area, very narrow, and, in places, potentially impacted by human development. However, little is known about migratory habitat for the YBC. They may be found in a variety of vegetation types during migration, including coastal scrub, secondary growth woodland, hedgerows, humid lowland forests, and forest edges from sea level to 8,125 feet (Hughes 1999, pp. 6-7). Additionally, during migration YBCs may be found in smaller riparian patches than those in which they typically nest. Thus, the variety of vegetation types suggests that the habitat needs of the YBC during migration are not as restricted as their habitat needs when nesting and tending young (Proposed Listing Rule for YBC, Federal Register 78(192) p. 61634). Given (1) the historical observations in proximity to the potential action area, most recently in 2012, (2) that any YBCs potentially in the area are likely transient migrants, (3) the variety of vegetation types that may be used during migration, and (4) biological concerns that have been expressed, we recommend conducting the full protocol surveys in the year prior to construction to evaluate presence and duration of the species within at least a 1-mile radius of the potential action area. The 1-mile radius recommendation is based on telemetry data in Sechrist et al. (2009. Western Yellow-billed cuckoo radio telemetry study results: Middle Rio Grande, New Mexico 2007-2008. USDI Bureau of Reclamation 58 pp.). The rationale is thus: (1) to date, YBC observations in western Montana have all been in June and July, however, we are unsure if the lack of August observations is due to the species not being here, or due to a lack of survey effort; and (2) once there is a full protocol survey effort (e.g., June, July, August), the results of the effort will help form the basis for your effects determination. If the surveys document presence, and potential breeding could be inferred, due to the species' site fidelity, the June and July exclusionary window would likely stand. However, if surveys indicate transient migrants or no presence, and it can be supported that disturbance won't affect a migrant's ability to shelter and/or feed, there would likely be more liberty on a work window.

a. If a playback survey is conducted and no detections are made after one year of surveying, would a “No Effect” call be warranted under ESA?

b. Due to the few documented occurrences of YBC in the vicinity of the project, would survey be required to reach NLAA, even if no SH is directly altered and if (no commitments at this time) the County could implement the construction window to minimize noise-related disturbance?

The survey efforts in the year prior to construction will improve the effects determination for the species by the Action Agency and make the determination more defensible. Taking all things into consideration (e.g., historical observations, results of the protocol survey efforts, conservation

measures, plans to restore impacted riparian vegetation, etc.), it could be determined if there would be (1) no effect whatsoever to the species, (2) insignificant and discountable effects, or (3) adverse effects.

3. Would the "riparian woodlands" in which the proposed action occurs have to meet a contiguous block size, stand age, and/or subcanopy composition before considered SH and therefore subject to such playback surveys?

a. Literature generally suggests western population of YBC is restricted to narrow zones of riparian woodlands comprised of dense, closed-canopy (mature) cottonwood-willow. YBC are found in woodland patches as small as 3ha, but that "40 ha of suitable habitat may be required for viable breeding populations (Bennet and Keinath 2003)." Laymon and Halterman (1989) described "optimum habitat patches for the western yellow-billed cuckoo are greater than 200 acres in size and wider than 1,950 feet; sites 101 to 200 acres in size and wider than 650 feet were suitable; sites 50 to 100 acres in size and 325 to 65 feet were marginal; and sites smaller than these dimensions were unsuitable.".

b. The document you provided states: *Breeding western Yellow-billed Cuckoos are riparian obligates and currently nest almost exclusively in low to moderate elevation riparian woodlands with native broadleaf trees and shrubs that are 20 hectares (ha) (50 acres (ac)) or more in extent within arid to semiarid landscapes (Hughes 1999, 79 FR 59992).*

c. Given the range of stand sizes/ages that may be considered suitable habitat, does your office have a screening tool or other metrics to determine SH? More specific metrics/screening tools and metrics would help us defensibly screen for SH.

In answer to these questions, please see my response regarding migratory habitat listed under question 2 above. Basically, no, the riparian woodlands would not have to meet a contiguous block size, stand age, and/or subcanopy composition to be considered suitable habitat for the protocol surveys. Given that the historical observations indicate the YBC in western Montana is likely a transient migrant, we're interested in migratory habitat, which is more general in nature. In response to Part C, our office does not currently have a screening tool or other metric to determine suitable habitat. However, we are willing to work with the Action Agency and any surveyor(s) in doing so for this project.

4. Unfortunately, the YBC breeding window (June 1 – July 31) cuts deeply into the in-water work window, though, as you mention, there appears biological support for extension of the in-water window into later portions of the summer/early fall due to prohibitively high instream temps in the mainstem. If we document no suitable breeding habitat for the YBC, it does not seem the June 1 – July 31window will provide much protection for the species, since only migratory habitat would be affected (assuming suitable).

Given that we are most likely dealing with migratory habitat, we are primarily concerned with effects to the species. Conducting the protocol surveys the year prior to construction will aid in determining if the species is present in the Action Area, and potentially, for how long. The pre-construction year surveys will help with the effects determination, and may aid in determination of the work window.

Regardless of the requirement to conduct them, I would be interested in more information regarding upcoming training opportunities for the playback surveys, and if one year of surveying would be sufficient. I have reached out within our company and it looks like we have some folks that are trained to conduct the surveys.

In coordination with other USFWS Field Offices, protocol survey training is done for this year. It is my understanding that other training opportunities will develop in late May or June next year, and will likely not occur in Montana. I will keep you posted as I learn more. Please remember that any YBC surveyor will need to have participated in these USFWS training opportunities and must be properly permitted by the USFWS (they will need an applicable 10(a)(1)(A) permit) and any necessary state permits. For permitting, it is my current understanding that an applicant will need to: (1) complete a USFWS-sponsored yellow-billed cuckoo protocol survey course; and (2) have YBC-specific survey experience. If an applicant does not have the in-field survey experience, in USFWS Region 6 (MT, WY, CO, UT, KS, NE, SD, and ND), they will need to complete at least 8 hours of survey work under an existing permittee. The level of survey experience will vary among the various USFWS regions. For example, Region 8 (CA and NV) requires 40 hours of YBC survey experience. Additionally, a permit is valid only in the Region in which it is issued, however, multi-region permits are possible, but will require additional processing time for inter-Region coordination. The recommendation is to submit the application for a permit in January/February to allow time for processing. It is my understanding that applicants can complete the protocol survey course and survey experience while the application is being processed.

If there are questions, please don't hesitate to contact me.

Mike

Mike McGrath
Fish and Wildlife Biologist
USFWS Montana ES Field Office
585 Shepard Way, Suite 1
Helena, MT 59601
406-449-5225 ext. 201

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Telework Schedule: Monday and Thursday 7 am - 5:30 pm

Helena: Tuesday and Wednesday 7 am - 5:30 pm

On Thu, Aug 13, 2015 at 6:06 PM, Holloway, Becky E. <Becky.Holloway@hdrinc.com> wrote:

Thanks for the feedback, Mike. I spoke with Ladd a few weeks ago and he relayed similar concerns about O'Brien Creek and bull trout use and occurrence in the anticipated action area for the project. I've passed Ladd's comments along to our environmental project manager.

Regarding the YBC - I don't yet have project design details so I can't comment on whether the project will occur in deciduous riparian woodlands. Our wetland biologist, Lisa Danielski, also a terrestrial bio and a strong birder, will be conducting a site visit in the next few months. She is well-versed with cuckoo habitat and will be assisting with the ESA consultation for that species.

You state below that you "recommend" protocol surveys be conducted if the "proposed action" occurs within deciduous riparian woodlands. To that, we have a few questions:

1. What part of the "proposed action" would trigger YBC playback surveys?

    a. Does this reference construction/operational noise disturbance that would reach potentially suitable breeding/rearing and/or general migratory habitat during the nesting season?

    b. Or direct alteration of such habitat during construction?

    c. Or both?

    d. We are unclear what, specifically, would trigger the recommendation for these surveys -

        i. While we agree that a habitat survey is warranted for the area to be affected (both by noise and direct alteration) to determine Suitable Habitat (SH) for YBC, a survey for species presence is not warranted until SH is determined, and construction effects are known. In past ESA efforts where bird occurrence has been infrequently documented, and breeding is unlikely, species surveys have not been required unless the goal of the ESA consultation was to achieve a No Effect call. To that end…

2. What is the goal of a survey?

a. If a playback survey is conducted and no detections are made after one year of surveying, would a “No Effect” call be warranted under ESA?

b. Due to the few documented occurrences of YBC in the vicinity of the project, would survey be required to reach NLAA, even if no SH is directly altered and if (no commitments at this time) the County could implement the construction window to minimize noise-related disturbance?

3. Would the “riparian woodlands” in which the proposed action occurs have to meet a contiguous block size, stand age, and/or subcanopy composition before considered SH and therefore subject to such playback surveys?

a. Literature generally suggests western population of YBC is restricted to narrow zones of riparian woodlands comprised of dense, closed-canopy (mature) cottonwood-willow. YBC are found in woodland patches as small as 3ha, but that “40 ha of suitable habitat may be required for viable breeding populations (Bennet and Keinath 2003).” Laymon and Halterman (1989) described “optimum habitat patches for the western yellow-billed cuckoo are greater than 200 acres in size and wider than 1,950 feet; sites 101 to 200 acres in size and wider than 650 feet were suitable; sites 50 to 100 acres in size and 325 to 65 feet were marginal; and sites smaller than these dimensions were unsuitable.”.

b. The document you provided states: *Breeding western Yellow-billed Cuckoos are riparian obligates and currently nest almost exclusively in low to moderate elevation riparian woodlands with native broadleaf trees and shrubs that are 20 hectares (ha) (50 acres (ac)) or more in extent within arid to semiarid landscapes (Hughes 1999, 79 FR 59992).*

c. Given the range of stand sizes/ages that may be considered suitable habitat, does your office have a screening tool or other metrics to determine SH? More specific metrics/screening tools and metrics would help us defensibly screen for SH.

4. Unfortunately, the YBC breeding window (June 1 – July 31) cuts deeply into the in-water work window, though, as you mention, there appears biological support for extension of the in-water window into later portions of the summer/early fall due to prohibitively high instream temps in the mainstem. If we document no suitable breeding habitat for the YBC, it does not seem the June 1 – July 31window will provide much protection for the species, since only migratory habitat would be affected (assuming suitable).

Regardless of the requirement to conduct them, I would be interested in more information regarding upcoming training opportunities for the playback surveys, and if one year of surveying would be sufficient. I have reached out within our company and it looks like we have some folks that are trained to conduct the surveys.

Finally, we're hoping to be able to discuss the project in more detail once we have made a determination regarding SH, and have more information regarding construction means and methods.

Thanks very much for your time. Appreciate the detailed information. It's very helpful.

Becky Holloway

T 253.858.5686 **M** 206 383-3068

hdrinc.com/follow-us

From: McGrath, Mike [mailto:mike_mcgrath@fws.gov]
Sent: Wednesday, August 12, 2015 1:15 PM
To: Holloway, Becky E.
Cc: Joe Weigand
Subject: Re: FW: Bull Trout in Bitterroot River at Maclay Bridge crossing

Hi Becky,

Thanks for the inquiry. Dan Brewer is one of our Fisheries Biologists, and one of the areas that he covers includes the Bitterroot River. However, I catch the transportation projects and work closely with the Montana Department of Transportation and the Federal Highway Administration throughout the state.

In response to your questions, this lower portion of the Bitterroot River does see a little use by bull trout for overwintering, is a migratory corridor, and has been designated as a critical habitat for the species, and serves as foraging, migratory, and overwintering (FMO) habitat. It does not contain spawning and rearing habitat, and is well known as being too warm for bull trout in the summer.

AVISTA Corporation, which operates the Thompson Falls, Noxon Rapids, and Cabinet Gorge dams on the lower Clark Fork River, has operated a "trap and transport" program for bull trout for the last several years, to allow for upstream migratory movement of the species from Lake Pend Oreille in Idaho. As part of their program, they are working with the Service's Abernathy Fish Technology Center to genetically assign in 24 hours the local population from which each fish originated so that they can transport each fish above the appropriate dam. Since 2004, they have transported >400 fish, of which 2 have been genetically assigned to Meadow Creek, which is a tributary of the East Fork Bitterroot River.

In discussing this project with Ladd Knotek, Montana Fish, Wildlife and Parks' fisheries biologist for the area, he has documented bull trout overwintering in the confluence of the Bitterroot and Clark Fork rivers, downstream of the project area, and indicated that bull trout, as well as other fish species, may use the mouth of O'Brien Creek as a thermal refugia, as it is a cold water refuge in summer. Ladd stressed the importance of O'Brien Creek from a fisheries standpoint because it is the only perennial tributary in this reach, and its mouth serves as a cold water refuge in summer. I support his recommendations that the project leave at least a 50 foot riparian area around the mouth of O'Brien Creek and prevent anglers from being able to access this location due to its importance as a refuge for fish. Additionally, due to the cold waters, if bull trout were to occur in the area, this area would attract them.

Regarding an in-water work window, in FMO habitat, which includes this reach, we typically recommend July 1 through August 31. However, given that the Bitterroot River is so warm through this reach, an argument could be made for a wider work window based on high water temperatures and their effect on bull trout presence.

Occurrences of yellow-billed cuckoos in western Montana are rare. Only eight occurrences of the species have been verified since 1959. These include: (1) a female with an egg in the oviduct found in the nearby Orchard Homes

neighborhood in 1980; and (2) a single bird that was photographed at 33 Marshall Street in Missoula in mid-June, 2012, and was likely seen a few days later along Tower Street (near the project area) a few days later (Montana Natural Heritage Database 2015). If the proposed action is within deciduous, riparian woodlands, we recommend conducting playback surveys following established protocols (attached). In order to obtain the necessary calls for the survey, the appropriate individual(s) would need to attend training to conduct the surveys. I can inquire as to upcoming training opportunities. However, no training is scheduled to occur in Montana. Despite the 1980 observation, we do not believe that there is a breeding population of yellow-billed cuckoos in western Montana. As a result, a section 10(a)(1)(A) permit would not be required from the Service to conduct the surveys.

The following conservation measures are intended to avoid, minimize, and mitigate effects to individual yellow-billed cuckoos and their respective habitat:

1. Adjust project timing to avoid disruption of individual yellow-billed cuckoos within riparian areas from June 1 through July 31.
2. Avoid or minimize the removal of yellow-billed cuckoo habitat, typically riparian vegetation.
3. Replace/replant removed riparian vegetation.

If you have any questions, please feel free to contact me.

Mike

Mike McGrath

Fish and Wildlife Biologist

USFWS Montana ES Field Office

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406-449-5225 ext. 201

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Telework Schedule: Monday and Thursday 7 am - 5:30 pm

Helena: Tuesday and Wednesday 7 am - 5:30 pm

From: Holloway, Becky E. [mailto:Becky.Holloway@hdrinc.com]
Sent: Tuesday, July 21, 2015 11:20 AM
To: Dan_Brewer@fws.gov
Subject: Bull Trout in Bitterroot River at Maclay Bridge crossing

Hello Dan –

I called the Helena field office and was given your name as a fish bio in the area. I'm going to be writing the ESA Section 7 document for a proposed new river crossing at the western terminus of South Avenue over the Bitterroot River, just west of Missoula. The project also includes removal of the existing Maclay Bridge, located about 0.4 river miles downstream of the proposed new crossing. I haven't had an engineer scale it off, but it looks to me like Maclay Bridge is located between RM 1-2 of the Bitterroot, just upstream of the confluence with the Clark Fork.

I'm just getting started pulling together the environmental baseline and status of species in the area and had a look at the IPac report, NHP data, MFISH, and Streamnet. The project reach is designated critical habitat for bull trout, but I'm hoping to dive a bit deeper, and better characterize use of the reach by bull trout. MFISH reports bull trout distribution in this reach of the Bitterroot as "rare", and that fluvial and adfluvial populations are present. Do you have familiarity with this area? I'm wondering if the reach is primarily used as a migratory corridor for adults and subadults, or if there is potential for other life history use (i.e., spawning or rearing)?

If primarily a migratory corridor, are there periods of more common occupancy to and from upstream spawning grounds? If spawning habitat, what is the typical timing?

Also, although I'm ahead of the design and don't have details regarding the type of bridge proposed to be installed, it is anticipated that full-spanning of the river is not feasible at the preferred crossing location. As such, some in-water work will likely be required for bridge piers. Is there an in-water work window for this stretch of the Bitterroot River? I imagine it will be a summer, low-flow window, but want to confirm if any specific dates are established.

Finally, sounds like you are a fish bio, but do you (or your colleagues) have any knowledge of suitable habitat or occurrence of yellow-billed cuckoo in the area? Our wetland and terrestrial biologists will be on site in the near future and will be assessing the suitability of habitat for listed terrestrial species, but I would like to get agency input. There are no reported observations of the cuckoo (or grizzly, or lynx) from the Natural Heritage database, within the subject Sections for either the new bridge or Maclay Bridge, but we want to cover all the bases.

Appreciate any input you can provide. FYI, I've also sent an inquiry email/voicemail to Chris Clancy at MFWP.

Thanks very much for your time.

Becky Holloway

Senior Environmental Biologist

HDR

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Becky.Holloway@hdrinc.com

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Harmon, Dan

From: Knotek, Ladd <lknotek@mt.gov>
Sent: Tuesday, November 24, 2015 10:17 AM
To: Greg Robertson
Subject: FWP Comments on MaClay/South Ave Bridges
Attachments: Initial FWP Comments Summary 2015.doc

Hi Greg-
Apparently we FWP didn't get any recent comments on record regarding the Maclay/South Ave Bridge project..
Attached is a written summary of the points we have talked about.. assuming the South Avenue bridge option is implemented.
Been getting quite a few inquiries regarding our thoughts/comments, so decided it would be good to summarize.
Shouldn't be anything new here.
Let me know if you see any issues, so we can work on them with you up front.
Thanks-
Ladd

W. Ladd Knotek
Fisheries Management Biologist
Montana Fish, Wildlife & Parks
3201 Spurgin Road
Missoula, MT 59804
(406) 542-5506
lknotek@mt.gov

FWP COMMENTS AND INFORMATION RELATED TO MACLAY AND SOUTH AVENUE BRIDGES

The information below summarizes and reiterates FWP's comments and recommendations related to the proposed South Avenue bridge construction on Bitterroot River. These comments pertain to fisheries concerns, protection of river and riparian integrity, and public access. Comments highlight the importance of lower O'Brien Creek as a spawning/rearing tributary and protection of adult trout that congregate near the stream mouth. In addition, public access for angling and recreation are important public considerations at the current (North Avenue) and potential South Avenue bridge locations.

Primary Concerns and Comments:

- Riparian Buffer along O'Brien Creek: The proposed bridge alignment and current approach easement run parallel and adjacent to lower O'Brien Creek. As bridge and approach locations are designed and surveyed, a substantial (50-100 ft), no disturbance buffer should be included along O'Brien Creek and at the confluence with the Bitterroot River. A large public investment has been made in this reach over the 15 years through restoration work, fish passage improvements, as well as adoption and enforcement of protective subdivision covenants.

- Minimizing Public Access and Disturbance on west end of proposed bridge : With the current easement alignment, the mouth of O'Brien Creek and fish holding water just downstream in the Bitterroot River lie directly adjacent to the west end of the proposed bridge. Both physical disturbance and public access should be limited at this location to minimize impacts to congregations of fish using this location. Specifically, mitigation measures should be incorporated to protect and enhance the buffer between the bridge and the confluence area, as well as discourage bank angling there.

- Maintain Public access at Maclay Bridge Location and provide adequate public river access at east end of South Avenue site: Public demand for river access is high in lower Bitterroot River reaches adjacent to Missoula. This includes access for angling, as well as other recreationists (e.g. tubers/floaters). Reasonable public river access and parking opportunity should be maintained at the Maclay Bridge site and on the East end of a new bridge location at South Avenue. These sites will be important components of the overall public river access plan for the Lower Bitterroot River reach near Missoula.

- Restore natural features to Maclay site if bridge is removed: If a new crossing is constructed at South Avenue, infrastructure associated with the Maclay Bridge should be removed and natural river features should be restored. This would include removal of bridge piers, pilings and abutments to an elevation below maximum scour depth, restoration of riparian buffers, and pulling back approaches to restore a normal cross-sectional width for this reach.

- Design of new bridge should not constrict the Bitterroot River cross-sectional (bankfull) width, should minimize riparian disturbance, and consider location of bridge piers to minimize collection of floating debris (LWD).

General Biological Information:

- Fish Species affected by Project: Lower O'Brien Creek in the project area supports westslope cutthroat trout (WCT), RainbowxWCT trout hybrids, brown trout, brook trout, mountain whitefish, and sculpin. The lower Bitterroot River has a similar species composition. No viable population of bull trout has ever been detected in O'Brien creek and population densities are extremely low in the lower main stem Bitterroot River. However, the mouth of O'Brien Creek is likely used seasonally by bull trout as it acts as a thermal refuge in summer and early fall. The lower Bitterroot River also provides important over-winter habitat for bull trout as this reach is heavily influenced by groundwater and generally maintains slightly higher over-winter temperatures than the Clark Fork River just downstream.

From: Maxell, Bryce <BMaxell@mt.gov>
Sent: Tuesday, May 10, 2016 9:43 AM
To: Schick, Jon
Subject: RE: Maclay Bridge, Missoula - bat roost

Hi Jon,

The survey notes indicate that this bridge was open without ideal crevices for bats and that it was likely only used as a night roost where bats land during the night to digest their early meal before going out to forage again. Comments are "Clustered droppings on E end of bridge. Sparse along beams and at sheltered corners of abutments. Mixed size class. Inaccess. For sample." So relatively minor nighttime use. Species using the bridge are unknown, but could include any of the 11 species known from western Montana http://fieldguide.mt.gov/displaySpecies.aspx?family=Vespertilionidae However, the most likely species to be using bridges of this type include Big Brown Bat, Little Brown Bat, Western Small-footed Myotis, and Yuman Myotis.

I don't think there are major concerns with alterations to this bridge from a bat perspective. However, bat habitat could actually be enhanced by providing some crevices that are on the order of 3/8 of an inch in the process of bridge alterations or by mounting bat houses on the bridge. Let me know if that is something you want information on.

-Bryce

Bryce A. Maxell
Program Coordinator
Montana Natural Heritage Program http://mtnhp.org
P.O. Box 201800, 1515 East Sixth Ave., Helena, MT 59620-1800
(406) 444-3989 (office) | (406) 461-1279 (cell) | (406) 444-0266 (fax)
bmaxell@mt.gov

From: Schick, Jon [mailto:Jon.Schick@hdrinc.com]
Sent: Tuesday, May 10, 2016 9:05 AM
To: Maxell, Bryce <BMaxell@mt.gov>
Subject: Maclay Bridge, Missoula - bat roost

Bryce –
I'm writing in hopes of obtaining additional information on the 6/17/2014 bat roost survey conducted at Maclay Bridge (ID L32101000_01001) in Missoula. I've obtained SOC spatial data from your organization

for the proposed South Avenue Bridge project in Missoula County. According to the SOC spatial data, fringed myotis, little brown myotis, and hoary bats have all been documented within the project vicinity; however, the last recorded observations date back to the 1960s and even earlier (1916) for hoary bat. Any assistance you may provide in helping identify the bat roost type would be appreciated and help us make appropriate avoidance and minimization recommendations to Missoula County and MDT for the project.
Thank you in advance.

Regards,

Jon Schick
Environmental Planner

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Meeting Minutes

Missoula County
South Avenue Bridge Project

BR 9032(65)
CN 6296000

Subject:	Preliminary Resource Agency Meeting	Meeting Location:	HDR Engineering Inc. Office 700 SW Higgins Street, Suite 200 (Clark Fork Conference Room)
Meeting Date:	August 18th, 2016 9 AM to 12 PM (Mountain)	Conference Call Information:	Call-in: (866) 583-7984 Code: 9457685

Attendees:

Mike McGrath – USFWS
Nathan Green – US Army Corps of Engineers
Brian Hasselbach – FHWA (in Helena)
Terry Voeller – MDT (in Helena)
Heidy Bruner – MDT (in Helena)
Susan Kilcrease – MDT
Joe Weigand - MDT
Larry Shock – MT DNRC
Bob Storer – MT DNRC
Christie Hollenbeck – MT DNRC
Ladd Knotek – MT FWP
Todd Klietz – Missoula County
Erik Dickson – Missoula County
Bob Schweitzer – Maclay Bridge Alliance
Fred Stewart – Maclay Bridge Alliance
Mike Burnside – Maclay Bridge Common Sense Coalition
Don Stevenson – Maclay Bridge Common Sense Coalition
Jon Schick – HDR
Dustin Hirose – HDR
Dan March – HDR (in Bozeman)
Chris Kelly - HDR

Meeting Purpose:

The purpose of this meeting was to discuss the permitting and construction of the new South Avenue Bridge over the Bitterroot River in Missoula, MT. The intent was to discuss resource-specific concerns and regulatory requirements well in advance of project implementation in an attempt to inform the design process moving forward and ultimately streamline the permitting process.

Topics Discussed:

Project Overview and Schedule

- Refer to the attached presentation
- MDT has indicated this project will be added to their STIP this year and 2020 is the earliest construction funding will be available.

Preliminary Bridge and Roadway Design

- Draft Type, Size & Location (TS&L) Study submitted to Missoula County
- 4-span bridge (no-rise scenario), 750 feet long is the preferred alternate on Alignment 1
- Pending comments from Missoula County and MDT, the TS&L study will be finalized and plans for alignment and grade will be completed
- Alignment developed to maintain a minimum 50-ft to 100-ft buffer from O'Brien Creek
- River Pines Road will be realigned to a T-intersection
- Will make a recommendation at next TDC meeting regarding the preferred typical section

Hydraulics Analysis and Floodplain

- Revised Floodplains
    - The corrected hydraulic model will be submitted to reviewing agencies in conjunction with the project-specific bridge hydraulic analysis for concurrent review
    - HDR will update the DFIRM within the project reach analyzed

    - Todd Klietz and Dan March to discuss further when it's time to do the final mapping. "Islands" excluded in the 100-yr floodplain could be shown as in or out (it's high enough to be shown as out but small enough to be mapped in).
- LOMR/CLOMR
    - The removal of Maclay Bridge and the addition of a new bridge will require LOMR
    - Todd Klietz indicated it is best practice to go through the CLOMR process in this case regardless of whether or not we have a rise in the BFE. Todd suggests a CLOMR regardless of no-rise analysis results.
- O'Brien Creek
    - The changes to the road prism on River Pines Road may impact the O'Brien Creek floodplain. The area is Zone A.
    - Base flood elevations for O'Brien Creek have not been modeled. HDR will investigate and discuss further with Todd Klietz.
- East Overbank Excavation
    - An area underneath the proposed bridge on the east bank would require excavation to meet the 'no rise' condition.
    - Excavation would be minimal: Approximately a foot in depth with 40:1 slopes.
    - Rip rap of this area is not anticipated. It would be planted with riparian vegetation.
    - 5- to 10-year flooding events would access/inundate this east overbank area. Sediment transport would be low and maintenance is anticipated to be minor.
    - The excavation area, if required, will be included in the right-of-way easement and maintained by the county
- The new bridge may need more than two feet for freeboard over the BFE.

<u>Maclay Bridge Removal</u>

- Preliminary bridge removal plan was reviewed
- FWP would like to see a bio-engineered approach to bank restoration once abutments are removed (not rip rap)
- DNRC suggested grading back/removing as much of the old west abutment area as possible that currently extends out into the river channel.
    - This could add hydraulic capacity and potentially help the no-rise situation.
    - Once the bridge piers are removed water will be directed more toward the far bank, which could potentially create erosion issues on the east bank in the vicinity of the bridge. Increased erosion could pose a hazard to the homes located on the east bank downstream and/or call for additional bank stabilization. Removal of as much of the west abutment area could alleviate potential downstream safety/maintenance issues resulting from increased erosion.
- Removal of existing piers will be to 3-ft below the thalweg. Coffer dams will likely be required for pier removal.
- The intent would be to retain the vegetated island/existing root mass around Pier 3. River morphology will likely affect the island over time.
- Special provisions will address demolition including measures to avoid/minimize debris in river and lead-based paint on structure.
- Historic status and Section 106
    - Maclay Bridge is eligible for listing on the National Register of Historic Places. It is currently in the nomination process.
    - Maclay Bridge will go through the Adopt-A-Bridge program per the MDT/SHPO programmatic agreement for historic bridges to find a potential new owner. The structure can likely be moved/removed intact.
    - MDT would take lead in Section 106 process. The USACE would like to be a signatory on the MOU.
    - The cultural resources work to date has included documentation of Maclay Bridge following Historic American Engineering Record (HAER) Level II standards.

<u>Environmental Documentation</u>

- The project includes preparation of a Categorical Exclusion (CE) level of environmental document
    - FHWA, MDT, and Missoula County have made determination early on that this project qualifies for a CE. The MDT corridor planning process and FHWA's Planning and Environmental Linkages (PEL) initiative support this decision.

- DNRC has specific obligations under NEPA/MEPA and operates under a different scope of rules and regulations regarding CEs. A CE prepared for new construction may not meet DNRC regulations.
- Under MEPA, MDT has their own implementation rules. MDT will provide the draft environmental document for DNRC review including all supporting analysis. DNRC may need additional analysis to meet their agency requirements under MEPA.
    - It was noted that DNRC has never had an instance where an MDT-prepared environmental document has not met their needs
- The environmental document will include analysis of the new bridge and removal of Maclay Bridge

Water Quality and Stormwater

- The current approach is to convey stormwater from the bridge away from the active river channel and dispense onto the east overbank. There may be a need for a detention facility on the west side. Further design is required to determine stormwater requirements.
- A closed system for stormwater conveyance is not being considered.
- If a west-side detention facility is required, consideration should be made to minimize impacts or return flow potential to O'Brien Creek and Big Flat Ditch through buffers and/or appropriate sloping. The irrigation ditch is siphoned under O'Brien Creek and this project should avoid impacts.
- The abandoned segments of River Pines Road will be obliterated: asphalt removed, re-graded, re-vegetated. This effort may provide for developing additional riparian buffer for mitigation.
- Any effects to the ditch and/or O'Brien Creek will be addressed in the environmental document.
- The project is partially within Missoula's MS4 area. HDR will go through standard MDT process and their Low Impact Development worksheet for project compliance.
- Any form of stormwater detention facilities need to be included in floodplain permit

In-stream Construction

- Pier type and configuration
    - The pier type is currently undetermined and will likely be either drilled shaft or driven piles. This configuration may include a two-column pier (drilled shaft foundation) or a wall type pier (pile foundation or shafts)
    - The pier configuration being recommended includes 2 piers in the active channel and is shown in the attached presentation (Alternate 1B).
- Scour protection
    - The bridge design will account for scour.
- Temporary structures
    - Temporary structures (work bridge) are likely required and will depend on contractor means/methods.

Timing restrictions

- Per MDT special provisions addressing Migratory Bird Treaty Act (MBTA) compliance, vegetation clearing will be limited to Aug 16 – April 15.
- USFWS typically recommends a July 1 – Aug 31 work window for in-stream construction. This window may be increased due to high river temperatures during summer, but also need to consider whether the mouth of O'Brien is being used as cold water refugia during the summer months.
    - FWP noted no bull trout documentation in past 25 years

Wildlife and Aquatic Species Consideration

- Osprey nests exist within the project area
    - The MBTA special provision will minimize impacts to osprey
    - Alternative nesting sites could be installed during non-nesting season in advance of construction
    - A special provision will be developed to instruct the contractor to coordinate with FWP representative Kristi DuBois prior to construction to locate nests and determine mitigation approach.
- FWP noted need for cutthroat trout considerations. Ladd will work with HDR to provide conservation measures. It won't be prohibitive, but may have requirements to protect the congregations.

Endangered Species Act (Section 7 consultation)

- The removal of Maclay Bridge and construction of the South Avenue Bridge are seen as one project. The Biological Assessment (BA) will need to address means/methods for construction, and assume the worst case scenario (i.e., driven piles with coffer dams). A detailed project description, including construction methods (to the level of detail that can be provided), will assist the USFWS in their analysis.
- The Biological Assessment being prepared focuses on bull trout and bull trout critical habitat and the yellow-billed cuckoo (YBC). Other federally-listed species for Missoula County are a non-issue due to lack of suitable habitat.
- FHWA is the lead agency regarding the project's federal nexus (i.e., federal funds involved).
- YBC have been documented in the project vicinity. USFWS has provided HDR information.
    - USFWS recommends project timing to avoid disruption (June/June exclusion), which leaves August for work window
    - Suggests surveys a year prior to construction to determine occurrence of YBC in area
    - Conducting surveys requires specific qualifications and permits. Permit needs to come out of Denver office or be approved by Denver office.
- USFWS confirmed that conservation measures similar to what have been used for bridge projects in the vicinity should be expected.

<u>Utilities</u>

- An exposed gas line exists on Maclay Bridge.
- No coordination with utilities has occurred. Missoula County will coordinate with utilities.
- MDT has a process for permitting if the gas company wants to attach to an MDT bridge.
    - DNRC would like to stay in the loop on that, in case it doesn't attach to the bridge and there will be separate permitting and easements.

<u>Environmental Permitting</u>

- Missoula County will be the applicant on environmental permits. MDT will review permit applications as necessary prior to agency submittal.
- Permit applications will need to be submitted prior to construction (at least 6-9 months in advance).
- Section 404
    - This project is anticipated to be covered under either Nationwide Permit (NWP) 14 or 23.
    - Anticipated wetland impacts are well below the 0.5-acre threshold for NWP 14. NWP 23 doesn't have an acreage limitation.
    - NWP 14 already has 401 Certification and may be a more logical permit to use
    - Temporary impacts should be addressed in the permit application.
        - It is standard practice for MDT to submit permit applications prior to bid letting. MDT doesn't apply for temporary impacts as to no limit contractor means/methods. Contractors are required to obtain permit coverage for temporary impacts.
    - Additional wetland survey will be required prior to permit submittal. Include OHWM delineation. The report can be submitted in advance of the permit for verification.
- DNRC Easement
    - Any permanent disposition of Trust Land (land below low water mark of Bitterroot River) needs to go to the Land Board for approval. The permitting schedule should account for review time.
    - DNRC would require a land use license (LUL) (i.e., temporary authorization for removal of old structure and any additional areas needed for construction that fall outside the permanent easement required for the new bridge). Applies to temporary staging, work bridge, etc., if outside easement footprint. Could likely wrap those into one LUL.
- SPA 124
    - FWP concerns relating to impacts to the bed and banks of the Bitterroot River and O'Brien Creek have been provided to the project team.
    - Ladd will provide necessary conservation measures to the project team sometime next month
- Storm Water (MPDES) and MS4
    - Project will require a SWPPP, which would be a contractor responsibility.
    - Dewatering is contractor responsibility.
- Floodplain permit
    - See discussion under Hydraulics Analysis and Floodplain

Additional Geotech

- Final geotechnical recommendations are not available to determine pier type.
- Additional geotechnical borings may be necessary within the river channel
    - If required, independent ESA consultation would be required
    - Additional permitting would be required
- Access would occur via barge

Recreation

- River access and parking
    - The project as currently scoped does not involve adding parking or improving access on either side of Maclay Bridge.
    - Small areas for temporary parking will remain following bridge/abutment removal to allow for limited access
    - Discussions between CAPS and FWP should occur soon to address access improvements
- Floater impacts during construction
    - This will be addressed through special provisions. HDR to work with Pat Saffel (FWP) to write appropriate special provisions.

Restoration and Revegetation

- Special provisions will include re-vegetation requirements and reseeding

Project Limits and Potential Future Improvements

- The project limits are between Hanson Drive and River Pines Road.
- The City is conducting independent study of South Avenue related to Fort Missoula development and future improvements.
- There is potential to use County maintenance funding for improvements, which will be phased in with County's other funding (based on 2020 construction funding available through MDT).

Public Involvement and TDC

- An overview of the county's public involvement process was provided. Refer to meeting presentation for detail.

United States Department of the Interior
Fish and Wildlife Service
Ecological Services
Montana Field Office
585 Shepard Way, Suite 1
Helena, Montana 59601-6287
Phone: (406) 449-5225; Fax: (406) 449-5339

M.17 FHWA (I)
06E11000-2017-B-0008

December 12, 2016

Jon Schick
HDR, Inc.
700 SW Higgins Avenue, Suite 200
Missoula, MT 59803-1489

Dear Mr. Schick,

Following the August 18, 2016 Resource Agency Meeting regarding the South Avenue Bridge and Maclay Bridge project, Mike McGrath , of my staff, committed to coordinating comments with Montana Fish, Wildlife and Parks (MFWP). Both projects cross the Bitterroot River in Missoula County, Montana. Our comments are prepared under the authority of, and in accordance with, the provisions of the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.), Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250), the Endangered Species Act (16 U.S.C. 1531 et. seq.), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq*.). Our comments do not address the overall environmental acceptability of the proposed action. We offer the following comments for your consideration.

Migratory Bird Treaty Act
We have reviewed the project information and have determined there may be potential effects to migratory birds. The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, and transportation (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted. Because migratory birds build nests on a variety of substrates (e.g., ground, shrubs, trees, structures), the Service recommends the following measures if the proposed work occurs during the breeding season: 1) the cutting or removal of trees or shrubs take place between August 16th and April 30th so as to remove potential nesting surfaces prior to project commencement; 2) the removal of swallow nests as they are built, but prior to egg laying, from any overhead structures that will be removed or impacted.

In addition to the above provisions for the MBTA, it has been noted that osprey (*Pandion haliaetus*) nests may occur at both the Maclay Bridge and South Avenue Bridge sites (Montana Natural Heritage Database 2016). The Service strongly recommends coordinating with MFWP regarding current osprey nest locations near the project area, and determining if the nests belong to the same osprey territory or if they are separate territories. The following options are available to accommodate ospreys under the MBTA:

1. Avoid construction activities when eggs or young are in the nest (April 15 to August 31) because under the MBTA harming or harassing nests with eggs or young is prohibited.
2. Remove the nest when it is not occupied by eggs or young (September 1 to April 14). However, once removed, the nest cannot be reduced to possession.
3. The responsible agency (Missoula County or the Montana Department of Transportation) can apply for a permit from the U.S. Fish and Wildlife Service's Migratory Birds Office in Denver, Colorado to relocate one or both nests to an alternate location.

Bald and Golden Eagle Protection Act

The Service recommends identification of potential bald eagle nests prior to project implementation. The Montana Natural Heritage Program database (MNHP 2016) indicates that bald eagle nests may occur approximately 1 mile from the proposed project. As such, we recommend that you confirm the locations of any eagle nest sites with MFWP. If a nest occurs within 0.5 mile of the project, we recommend that the project comply with the temporary seasonal and distance construction buffers stipulated in the *2010 Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan (1994).*

The Bald and Golden Eagle Protection Act (BGEPA) prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald or golden eagles, including their parts, nests, or eggs. The BGEPA provides criminal and civil 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 any golden eagle], alive or dead, or any part, nest, or egg thereof. The BGEPA defines "take" as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

Threatened and Endangered Species

The current list of candidate, proposed, threatened or endangered species, and designated critical habitat occurring in Missoula County, Montana is as follows:

Scientific Name	***Common Name***	***Status****
Lynx canadensis	Canada Lynx	LT, CH
Salvelinus confluentus	Bull Trout	LT, CH
Ursus arctos horribilis	Grizzly Bear	LT
Howellia aquatilis	Water Howellia	LT
Coccyzus americanus	Yellow-billed cuckoo (western pop.)	LT
Calidris canutus rufa	Red Knot	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C

*LE=Listed as Endangered, LT=Listed Threatened, C=Candidate species for listing, P=Proposed, CH=Designated Critical Habitat

The species list provided above indicates those that may occur in Missoula County, but it is unlikely all of these will occur within your specific project area. Those in the vicinity of the project area likely include the threatened bull trout and their designated critical habitat, and the threatened yellow-billed cuckoo. Based on these species, the Service recommends the following:

Water Quality

- A no-disturbance riparian buffer shall be delineated with visible markers along the north edge of O'Brien Creek through the project area to protect the stream corridor during project implementation. Where possible, this buffer shall be a minimum of 50 ft. An exception is where the current road shoulder lies within 50 ft of the stream. In this case, no existing woody vegetation along the stream shall be disturbed and the buffer shall be expanded once the existing road prism is removed and relocated.
- Stormwater facilities for the proposed South Avenue Bridge should be designed such that return flow potential to O'Brien Creek and Big Flat Ditch be eliminated or minimized through buffers and/or appropriate sloping.
- Ensure best management practices for erosion control are applied to this project, including, but not limited to:
    - Install and maintain appropriate BMPs to prevent erosion and sediment transport;
    - Reseed and revegetate all disturbed areas with desirable vegetation;
    - Stabilize disturbed channel banks using appropriate BMPs; and
    - Conduct work to minimize disturbance to riparian vegetation.
- Collect and dispose of all waste fuels, lubricating fluids, herbicides, and other chemicals in accordance with all applicable laws, rules and regulations to ensure no adverse environmental impacts will occur. Inspect construction equipment daily to ensure hydraulic, fuel and lubrication systems are in good condition and free of leaks to prevent these materials from entering any stream. Locate vehicle servicing and refueling areas, fuel storage areas, and construction staging and materials storage areas to ensure that spilled fluids or stored materials do not enter any stream.
- Structures designed to minimize sediment and pollutant runoff from sensitive areas such as settling ponds, vehicle and fuel storage areas, hazardous materials storage sites, erosion control structures, and coffer dams should be visually monitored daily, especially following precipitation events, to ensure these structures are functioning properly. These structures should also be sized appropriately to handle foreseeable events (e.g., thunderstorms).
- Any detention basin outlets will be designed such that they are stabilized to prevent streambank erosion and will not otherwise impact the stream channel bank.
- The contractor will dispose of drill cuttings in areas in a manner which will not adversely affect federally listed species and/or designated critical habitat. Barge debris will be captured and/or contained to prevent material from entering the channel.
- Contractor-provided sites, including, but not limited to staging areas, material sources, and fill sites, will not adversely affect listed species or their designated critical habitats.

Timing

- Bull trout are likely to be in this reach between October 1st and June 15th. The Bitterroot River is typically too warm for bull trout July through September. As such, the Service recommends an instream work window of July 1 through September 30th.
- Yellow-billed cuckoos have been known to occur in proximity to the project area. However, they are not known to nest in Montana, and any yellow-billed cuckoos are likely transient migrants. As such, the Service recommends that the project adjust its timing to avoid disruption of individual yellow-billed cuckoos within riparian areas from June 1 through July 31. We realize that this would likely reduce the project's instream operating window to August 1 through September 30. To potentially regain portions of the instream operating window, we recommend conducting full protocol surveys for yellow-billed cuckoos in the year prior to construction. Once there is a full protocol survey effort, the results of the effort will help form the basis for an effects determination. If the surveys document presence, and potential breeding could be inferred, due to the species' site fidelity, the June and July exclusionary window would likely stand. However, if surveys indicate transient migrants or no presence, and it can be supported that disturbance won't affect a migrant's ability to shelter and/or feed, there would likely be more flexibility on a work window.

Bridge Construction

- To reduce the effects of impact pile driving, the Service recommends that the new bridge utilize drilled shafts for piers and abutments, rather than impact-driven piles.
- To minimize effects to overwintering and migrating bull trout, the Service recommends that impact pile driving for the construction of temporary and permanent facilities that has not been attenuated for noise occur between July 1 and September 30, provided that it can be established that yellow-billed cuckoos in the area are either transient migrants or are not present, and that it can be supported that disturbance won't affect a migrant's ability to shelter and/or feed. This work includes dry land and in-water impact pile driving.
- To minimize the risk of barotraumas and fish mortality from driving piles for construction of the new bridge and any temporary work bridges outside the above time period:
    - Use a vibratory hammer to drive piles to such a point when an impact hammer will be required to drive the pile to the point of refusal OR;
    - Initiate impact hammer pile-driving of each pile with lower hammer strokes than are required for the initial six strikes to encourage fish to vacate the surrounding area, and use the National Marine Fisheries Service Calculator Tool to determine how many pile strikes can occur during a day, based on pile type and size, prior to the thresholds being attained. Once the number of strikes has been attained, impact pile driving must be stopped for the day. If driving pile with an impact hammer over consecutive days, do not drive piling between the hours of 9:00 PM and 6:00 AM. OR;
    - Use MDT-approved noise reduction methods, such as those offered in Leslie and Schwertner (2013) (e.g., bubble curtain, cofferdams) AND;
    - Conduct hydroacoustic monitoring. Through hydroacoustic monitoring, should it be determined that the physical harm thresholds of the peak sound pressure level (SPL) OF 206 dB (re: 1 µPa), or the cumulative sound exposure level (SEL) of 187 dB (re: 1 µPa) for fish > 2 g, or 183 dB (re: 1 µPa) for fish < 2 g have been attained or

exceeded, impact pile driving must be stopped for the day, with impact pile driving permitted to commence the next morning.

- In-stream work conducted within the channel should be kept to the minimum amount necessary, preferably during periods of low flow. This includes, but is not limited to, construction and removal of any coffer dams that may be needed for the driving and removal of pilings for any temporary support structures that may be necessary. In-stream construction work should be completed in the shortest amount of time possible.
- Any temporary work or detour bridges necessary at these crossings should clear span the stream channel, if possible. No construction equipment should be allowed to operate within the active channel of any stream unless permitted to do so. If at all possible, schedule instream construction activities such that as many of the necessary construction activities as possible occur "in the dry."
- Materials excavated from inside any coffer dams or drilled shafts shall not enter any waterbody, and if so, will be removed.
- De-watering activities will require that the effluent be pumped to an upland detention area that will allow for the sediments to separate out and water infiltrate into the groundwater system.
- The Service also recommends that the disturbance footprint from construction be limited to the right-of-way.
- All disturbed areas should be revegetated with woody plants and native grasses.

Bridge Removal

- Instream removal of bridge piers should occur during low water (July 1 through September 30).
- To the maximum extent possible, disassemble the existing bridge superstructure and remove without pieces being allowed to fall into the stream. If portions of the old bridge do fall into the stream during demolition, they will be removed from the stream without dragging the material along the streambed, and will be removed within two days. Any blasting that is required should be contained to the maximum extent possible by using some typed of containment shielding device to attenuate the blast's pressure wave in the water and to prevent debris from entering the stream.
- Once the Maclay Bridge has been removed, the Service recommends that:
    - The channel constriction associated with the west bank of the river at the Maclay Bridge be removed, as this may alleviate some of the bank erosion problems occurring further downstream.
    - A more naturalized cross-section of the river be re-established to partially offset effects from installation of a new bridge at the end of South Avenue; and
    - Stream banks and riparian areas currently occupied by the Maclay Bridge be restored and revegetated.

Under the Endangered Species Act (ESA) a federal agency that authorizes, funds, or carries out a proposed action is required to evaluate the action with respect to effects to threatened or endangered species and critical habitat. If the federal agency, or its delegated agent, determines that the action "may affect" listed species and/or designated critical habitat, the federal agency is required to enter into section 7 consultation with the Service. It is the responsibility of the federal agency to ensure that its actions are in compliance with the ESA. Further technical assistance can be provided if you have additional questions regarding project impacts to listed species, or future ESA responsibilities.

Fish and Wildlife Coordination Act
Under the Fish and Wildlife Coordination Act (FWCA) and its amendments, consultation with the Service and the fish and wildlife agencies of States where any body of water is controlled or modified by any Federal agency. Because a Clean Water Act permit will be required for the Federal Highway Administration to construct the new bridge and remove the existing bridge, the FWCA is applicable in this situation.

The westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) is a fish native to Montana that has been classified by Montana Fish, Wildlife and Parks as a Species of Greatest Conservation Need, and has previously been petitioned for listing under the Endangered Species Act. The mouth of O'Brien Creek serves as a consistent staging and congregation area for migratory trout. As a result, the Service recommends:

- Instream and stream bank disturbance be minimized at the mouth of O'Brien Creek and for 100 meters downstream along the northwest bank of the Bitterroot River.
- If pier location or anticipated instream work associated with the final bridge design occurs within this area, further consultation and coordination with Montana Fish, Wildlife and Parks and the Service occur in order to avoid and minimize adverse effects.

Additional Guidance
In addition to coordination with the Service, we recommend coordination with Montana Fish, Wildlife and Parks and the Montana Natural Heritage Program. These agencies may be able to provide updated, site-specific information regarding eagle and other raptor nests, as well as all other fish, wildlife, and sensitive plant resources occurring in the proposed project area. Contact information for these two agencies is below:

Montana Fish, Wildlife and Parks
1420 East Sixth Avenue
P.O. Box 200701
Helena, Montana 59620-0701
Phone: (406) 444-2535

Montana Natural Heritage Program
1515 East 6th Avenue, Box 201800
Helena, Montana 59620-1800
Phone: (406) 444-5354.

Thank you for the opportunity to comment on the South Avenue Bridge and Maclay Bridge project. The Service appreciates your efforts to incorporate fish and wildlife resource concerns into your project planning. If you have further questions related to this issue, please do not hesitate to contact Mike McGrath at mike_mcgrath@fws.gov or (406) 449-5225, extension 201.

Sincerely,

for Jodi L. Bush
Field Supervisor

cc: Heidy Bruner, Federal Highway Administration, Helena, MT
Nathan Green, U.S. Army Corps of Engineers, Missoula, MT
Joe Weigand, Montana Department of Transportation, Helena, MT
Ladd Knotek, Montana Fish, Wildlife and Parks, Missoula, MT

APPENDIX C: Wetland Delineation Methodology

USACE Wetland Determination Data Forms

MDT Montana Wetland Assessment Forms

Representative Site Photos

Wetland Delineation Methodology

Wetlands are defined as areas saturated or inundated by surface or groundwater at a frequency and duration sufficient to support, and which under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. The methods used to delineate the on-site wetlands conform to methods described in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), and *the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010). All delineated wetlands were surveyed with a Trimble Geo-7X unit and mapped on project base maps.

To be considered a wetland, an area must have hydrophytic vegetation, hydric soils, and wetland hydrology. HDR staff collected data on these parameters in areas representative of typical site conditions. Typically, additional data is collected in associated uplands to confirm wetland boundaries; however, site access to certain properties was not provided prior to the field survey and HDR staff was unable to establish paired plot samples. Soil sampling plot locations and ordinary high water marks (OHWM) in the study area were recorded with sequentially-numbered GPS points.

Vegetation

The dominant plants and their wetland indicator status were evaluated to determine if the vegetation was hydrophytic. To determine which plants were dominant at a sample plot, biologists applied the 50/20 rule per Corps recommendations. Under this guidance absolute cover estimates were made for each species found rooted within the sample plot, for each vegetative strata found in the habitat (tree, sapling/shrub, herb, and woody vine). The species that had the most cover was included along with the next species until the absolute cover of these totaled more than 50% of the total absolute cover. Any other species that represented at least 20% of the total absolute cover was also included as a dominant species for that vegetative strata.

Sample plots varied in size depending on site topography and habitat complexity. The objective of establishing a plot was to depict particular plant associations that reflect specific water regimes or other ecological factors. Therefore, on steep-sided embankments, a plot may consist of a narrow strip along the water's edge or within a floodplain a plot may be a standard 30-foot circle.

Hydrophytic vegetation is defined as vegetation adapted to wetland conditions. To meet the hydrophytic vegetation criterion, more than 50% of the dominant plants in each stratum must be Facultative, Facultative Wetland, or Obligate, based on the wetland indicator category assigned to each plant species by the Corps national wetland plant list (NWPL) of the US Army Corps of Engineers (Lichvar, R.W. et. al. 2016). Table C-1 lists the definitions of the indicator categories.

Table C-1. Definitions of Wetland Plant Indicator Categories used to Determine the Presence of Hydrophytic Vegetation

Wetland Indicator Category	Symbol	Definition
Obligate Wetland Plants	OBL	Plants that almost always (> 99% of the time) occur in wetlands, but which may rarely (< 1% of the time) occur in non-wetlands.
Facultative Wetland Plants	FACW	Plants that often (67 to 99% of the time) occur in wetlands, but sometimes (1 to 33% of the time) occur in non-wetlands.
Facultative Plants	FAC	Plants with a similar likelihood (34 to 66% of the time) of occurring in both wetlands and non-wetlands.
Facultative Upland Plants	FACU	Plants that sometimes (1 to 33% of the time) occur in wetlands, but occur more often (67 to 99% of the time) in non-wetlands.
Upland Plants	UPL	Plants that rarely (< 1% of the time) occur in wetlands, and almost always (> 99% of the time) occur in non-wetlands.

Source: Lichvar et al. (2012).

HDR biologists identified plants to species in the field, as feasible, and estimated percent cover of dominant plants. Scientific and common plant names follow currently accepted nomenclature. Names are consistent with the National Wetland Plant List (Lichvar et al. 2016). During the field investigation, staff observed and recorded the dominant plant species on data sheets for each data plot.

Soils

Generally, an area must contain hydric soils to be a wetland. Hydric soil forms when soils are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (12 inches). Biological activities in saturated soil result in reduced oxygen concentrations and organisms turn to anaerobic processes for metabolism. Over time, anaerobic biological processes result in certain soil color patterns, which are used as indicators of hydric soil. Typically, low-chroma colors are formed in the soil matrix, and bright-colored redoximorphic features form within the matrix. Other important hydric soil indicators include organic matter accumulations in the surface horizon, reduced sulfur odors, and organic matter staining in the subsurface (USDA NRCS 2010).

HDR staff examined soils by excavating sample pits to a depth of 16-20 inches to observe soil profiles, colors, and textures. In some cases, a shallower soil pit was adequate to document hydric soil indicators. Munsell color charts (Munsell Color 2009) were used to describe soil colors. Alpha, alpha-dipyridyl strips were used on saturated soils when redoximorphic features were not visible to the naked eye. The strips were used to determine the presence or absence of ferrous (reduced) iron, which is an indicator of hydric soils (USACE 2010).

Hydrology

Project staff examined the area for evidence of hydrology. Wetland hydrology criteria were considered to be satisfied if it appeared that the soil was seasonally inundated or saturated to the surface for a consecutive number of days greater than or equal to 12.5% of the growing season. The growing season for the area was determined based on the period in which temperatures are above 28 degrees Fahrenheit 5 out of 10 years (Ecology 1997) using the long-term climatological data collected by the U.S. Department of Agriculture Natural Resource Conservation Service. Using the WETS table for the nearest station (Missoula International Airport, MT153), the growing season was approximated to be from April 28 to September 1 (155 days) (based on a 70 percent probability) (USDA NRCS 2016a).

Primary indicators of hydrology include surface inundation and saturated soils, reduced iron, algal mat, surface water, and water-stained leaves, and oxidized root channels. Secondary indicators of hydrology include drainage patterns, dry season water table, geomorphic position, and FAC-neutral test (USACE 2010). Variations to the standard methodology, if necessary, are indicated on the data forms.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Ave Bridge City/County: Missoula Co. Sampling Date: 10/6/15
Applicant/Owner: Missoula County State: MT Sampling Point: SP1
Investigator(s): Jon Schick, Lisa Danielski Section, Township, Range: 13N, 20W, Sec 27
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): ~2%
Subregion (LRR): Rocky Mnt Forests & Range (E) Lat: 46.8488 Long: -114.104 Datum: NAD83
Soil Map Unit Name: Grantsdale loam, 0-2% slopes NWI classification: PEMI
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____
Is the Sampled Area within a Wetland? Yes X No ____

Remarks: SP1 in WL1 on right bank of Bitterroot River near bridge alignment. Narrow fringe of WL just below OHWM. Could not get paired plot due to property access restrictions.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Eleocharis palustris	85	Y	OBL
2. Carex vesicaria	5	N	OBL
3. Veronica arvensis	<1	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum ~5

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	1	x 4 =	4
UPL species	0	x 5 =	0
Column Totals:	91 (A)		94 (B)

Prevalence Index = B/A = 1.03

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Some Utricularia nearby

SOIL

Sampling Point: SP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR 5/2	93	10YR 5/8	7	C	M/PL	sandy loam	
7-20	10YR 4/1	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: –

Depth (inches): –

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- X Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 20"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 19"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: 2° indicators of wetland hydrology present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Ave Bridge City/County: Missoula Co Sampling Date: 10/6/15

Applicant/Owner: Missoula County State: MT Sampling Point: SP 2

Investigator(s): Jon Schick, Lisa Danielski Section, Township, Range: 13N, 20W, Sec 27

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): E- Rocky Mnt Forests & Rangeland Lat: 46.8496 Long: -114.1046 Datum: NAD 83

Soil Map Unit Name: Xerofluvents, 0-2% slopes NWI classification: PEMI

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: SP2 in WL2 on left bank of Bitterroot River near new bridge alignment. No paired plot due to property access restrictions. SP2 near WL boundary.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Carex vesicaria	90		OBL
2. Eleocharis palustris	10		OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 100	x 1 = 100
FACW species _____	x 2 = 0
FAC species _____	x 3 = 0
FACU species _____	x 4 = 0
UPL species _____	x 5 = 0
Column Totals: 100 (A)	100 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: SP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/1	100					loamy sand	
8-17	10YR 4/1	100					gravel/loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: cobble

Depth (inches): 17"

Hydric Soil Present? Yes X No ___

Remarks:

Shovel refusal @ 17". Very dense root layer in upper 8". Problematic soils exist. SP2 is within a vegetated sand/gravel bar/floodplain. Hydric soils assumed based on presence of wetland hydrology and hydrophytic vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): > 17"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 17"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Shovel refusal @ 17", so could not confirm dry season water table.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Ave Bridge City/County: Missoula Co Sampling Date: 10/8/15
Applicant/Owner: Missoula County State: MT Sampling Point: SP V-1
Investigator(s): Jon Schick, Lisa Danielski Section, Township, Range: 13N, 20W, Sec. 27
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): E- Rocky Mnt Forests/Rangeland Lat: 46.8499 Long: -114.1057 Datum: NAD83
Soil Map Unit Name: Bigarm gravelly loam, 0-4% slopes NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Verification plot on Barrett property on low spot, near proposed road reroute. Tilled/mowed field, No wetland indicators.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: –)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. Symphoricarpos albus	1	Y	FACU
2.			
3.			
4.			
5.			
	1 = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Bromus inermis	60	Y	FAC
2. Cirsium arvense	10	N	FAC
3. Leucanthemum vulgare	5	N	FACU
4. Centaurea maculosa	5	N	UPL
5. Achillea millefolium	5	N	FACU
6. Medicago lupulina	5	N	FACU
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: –)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	–	x 1 =	0
FACW species	–	x 2 =	0
FAC species	70	x 3 =	210
FACU species	16	x 4 =	64
UPL species	5	x 5 =	25
Column Totals:	91 (A)		299 (B)

Prevalence Index = B/A = 3.29

Hydrophytic Vegetation Indicators:
__ 1 - Rapid Test for Hydrophytic Vegetation
__ 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ 5 - Wetland Non-Vascular Plants[1]
__ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Vegetation is mowed/grazed

SOIL

Sampling Point: SP V-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-19	10YR 2/1	100					loam	
19-24	10YR 3/1	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Does not meet hydric soil indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >24"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >24"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No 1° or 2° hydrology indicators

MDT Montana Wetland Assessment Form (revised March 2008)

1. **Project Name:** Missoula Co S. Ave Br. 2. **MDT Project #:** _____ **Control #:** _____

3. **Evaluation Date:** Mo. 10 Day 6 Yr. 15 4. **Evaluator(s):** Danielski/Schuck 5. **Wetlands/Site #(s):** Wetland 1

6. **Wetland Location(s):** i. **Legal:** T 13 (N) or S; R 20 E or (W) S 27 ; T ____ N or S; R ____ E or W; S _____ ;
ii. **Approx. Stationing or Mileposts:** Bitterroot Rm 1.90
iii. **Watershed:** 17010205 **Watershed Name, County:** Bitterroot, Missoula County

7. a. **Evaluating Agency:** HDR ;
b. **Purpose of Evaluation:**
1. X Wetlands potentially affected by MDT project
2. ____ Mitigation wetlands; pre-construction
3. ____ Mitigation wetlands; post-construction
4. ____ Other _____

8. **Wetland size:** (total acres) 0.15 (visually estimated)
_____ (measured, e.g. by GPS [if applies])

9. **Assessment area (AA):** (acres, see instructions on determining AA) 0.15 (visually estimated)
_____ (measured, e.g. by GPS [if applies])

10. **Classification of Wetland and Aquatic Habitats in AA**

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Riverine	EM	—	S1	100%

Abbreviations: (*see manual for definitions*)

HGM Classes: Riverine (**R**), Depressional (**D**), Slope (**S**), Mineral Soil Flats (**MSF**), Organic Soil Flats (**OSF**), Lacustrine Fringe (**LF**);

Cowardin Classes: Rock Bottom (**RB**), Unconsolidated bottom (**UB**), Aquatic Bed (**AB**), Unconsolidated Shore (**US**), Moss-lichen Wetland (**ML**), Emergent Wetland (**EM**), Scrub-Shrub Wetland (**SS**), Forested Wetland (**FO**)

Modifiers: Excavated (**E**), Impounded (**I**), Diked (**D**), Partly Drained (**PD**), Farmed (**F**), Artificial (**A**)

Water Regimes: Permanent / Perennial (**PP**), Seasonal / Intermittent (**SI**), Temporary / Ephemeral (**TE**)

11. **Estimated relative abundance:** (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
(Circle one) Unknown Rare Common (Abundant)

12. **General condition of AA:**
i. **Disturbance:** (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) lists)

Conditions within AA	*Predominant conditions adjacent to (within 500 feet of) AA*		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc.):

ii. **Prominent noxious, aquatic nuisance, & other exotic vegetation species:** Species w/in WL are native

iii. **Provide brief descriptive summary of AA and surrounding land use/habitat:** Riverine fringe wetland; agricultural land adjoins to the east

13. **Structural Diversity:** (based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes], see #10 above)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	(M)	←NO	YES→	L
1 class, monoculture (1 species comprises ≥90% of total cover)	L	NA	NA	NA

Comments: ~85% Eleocharis; 15% other spp

SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (**list species**)	(D) S	Bull trout (LT)
Secondary habitat (**list species**)	D S	
Incidental habitat (**list species**)	D S	
No usable habitat	S	

ii. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	(1H)	.9H	.8M	.7M	.3L	.1L	0L

Sources for documented use (e.g. observations, records, etc):
USFWS. Wetland below confluence of Bitterroot R, which is designated critical Habitat. CH includes areas below confluence of waterbody

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (**list species**)	(D) S	West Slope Cutthroat trout (S2) - year-round resident
Secondary habitat (**list species**)	D S	
Incidental habitat (**list species**)	D S	
No usable habitat	S	

ii. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	(.9H)	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use (e.g. observations, records, etc.): MNHP, MFWP MFish. Wetland is

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (circle substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):
- __ observations of abundant wildlife #s or high species diversity (during any period)
- __ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- __ presence of extremely limiting habitat features not available in the surrounding area
- __ interviews with local biologists with knowledge of the AA

Minimal (based on any of the following [check]):
- __ few or no wildlife observations during peak use periods
- __ little to no wildlife sign
- __ sparse adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):
- X observations of scattered wildlife groups or individuals or relatively few species during peak periods
- __ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- __ adequate adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, circle appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13.* For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	(S/I)	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	(H)	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	(High)	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	(.7M)	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments:

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then circle **NA** here and proceed to 14E.)

Type of Fishery: Cold Water (**CW**) X Warm Water (**WW**)____ **Use the CW or WW guidelines in the user manual to complete the matrix**

AA is @ ~ RM 1.8 on Bitterroot

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [circle] the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
Aquatic hiding / resting / escape cover	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA: MFWP

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* (Y) N *If yes, reduce score in* ***i*** *above by 0.1:*_____

TMDL for not fully supporting aquatic life beneficial use

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? Y (N) *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*_____

iii. Final Score and Rating: 0.3 **Comments:**

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle **NA** here and proceed to 14F.)

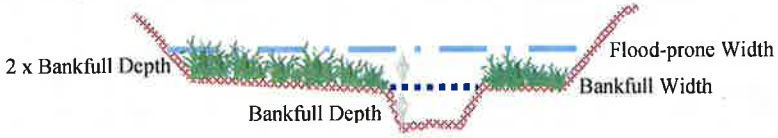
i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

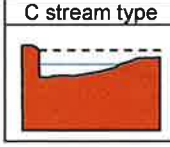
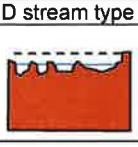
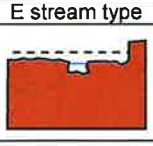
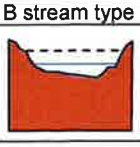
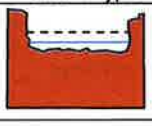
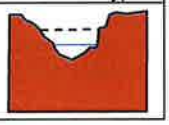
Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched – B stream type			Entrenched-A, F, G stream types		
% of flooded wetland classified as forested and/or scrub/shrub	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no outlet or restricted outlet**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Entrenchment ratio (ER) estimation – see User's Manual for additional guidance. Entrenchment ratio = (flood-prone width)/(bankfull width)
Flood-prone width = estimated horizontal projection of where 2 x maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____

Flood-prone width / *Bankfull width* = *Entrenchment ratio (ER)*



Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						

ii. Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (circle)? Y (N) **Comments:**

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, circle **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ **5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, circle **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: TMDL for Lead

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, circle **NA** here and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

*% Cover of **wetland** streambank or shoreline by species with stability ratings of ≥6 (see **Appendix F**).*	*Duration of surface water adjacent to rooted vegetation*		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: Eleocharis has a stability rating of 6

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [circle])

General Fish Habitat Rating (14D.iii.)	General Wildlife Habitat Rating (14C.iii.)		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.7M	.8H	.5M	.6M	.4M	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? Y (N) *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:*_____

iv. Final Score and Rating: _____ **Comments:**

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators
- ____ The AA is a slope wetland
- ____ Springs or seeps are known or observed
- ____ Vegetation growing during dormant season/drought
- ____ Wetland occurs at the toe of a natural slope
- ____ Seeps are present at the wetland edge
- ____ AA permanently flooded during drought periods
- ____ Wetland contains an outlet, but no inlet
- ____ Shallow water table and the site is saturated to the surface
- ____ Other:_____

ii. Recharge Indicators
- ____ Permeable substrate present without underlying impeding layer
- ____ Wetland contains inlet but no outlet
- ____ Stream is a known 'losing' stream; discharge volume decreases
- ____ Other:_____

Bitterroot is generally a gaining stream

iii. Rating (use the information from i and ii above and the table below to arrive at [circle] the functional points and rating)

Criteria	Duration of saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM***			
	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	N/A			

Comments:

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7M	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (circle) Y **N** (if 'Yes' continue with the evaluation; if 'No' then circle **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ___ Educational/scientific study; ___ Consumptive rec.; ___ Non-consumptive rec.; ___Other

iii. Rating (use the matrix below to arrive at [circle] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S):_____

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	H	1	1		
B. MT Natural Heritage Program Species Habitat	H	0.9	1		
C. General Wildlife Habitat	M	0.7	1		
D. General Fish Habitat	M	0.3	1		
E. Flood Attenuation	M	0.5	1		
F. Short and Long Term Surface Water Storage	L	0.3	1		
G. Sediment/Nutrient/Toxicant Removal	M	0.4	1		
H. Sediment/Shoreline Stabilization	M	0.6	1		
I. Production Export/Food Chain Support	M	0.5	1		
J. Groundwater Discharge/Recharge	L	0.1	1		
K. Uniqueness	L	0.3	1		
L. Recreation/Education Potential (bonus points)	N/A	N/A	NA		
Totals:		5.6	11		
Percent of Possible Score			51 %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- X Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ___ Score of 1 functional point for Uniqueness; **or**
- ___ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ___ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ___ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ___ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ___ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ___ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ___ Score of .9 functional point for Uniqueness; **or**
- ___ Percent of possible score > 65% (round to nearest whole #).

Category III Wetland: (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)
- ___ "Low" rating for Uniqueness; **and**
- ___ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ___ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA RATING: (circle appropriate category based on the criteria outlined above) **I** **II** **III** **IV**

MDT Montana Wetland Assessment Form (revised March 2008)

1. **Project Name:** Missoula Co S. Ave Br. 2. **MDT Project #:** _____ **Control #:** _____

3. **Evaluation Date:** Mo 10 Day 6 Yr. 15 4. **Evaluator(s):** Danielski/Schick 5. **Wetlands/Site #(s):** Wetland 2

6. **Wetland Location(s):** i. **Legal:** T 13 (N) or S; R 20 E or (W) S 27 ; T ___ N or S; R ___ E or W; S ___ ;
ii. **Approx. Stationing or Mileposts:** Bitteroot RM 1.8
iii. **Watershed:** 17010205 **Watershed Name, County:** Bitteroot, Missoula Co

7. a. **Evaluating Agency:** HDR ;
b. **Purpose of Evaluation:**
1. X Wetlands potentially affected by MDT project
2. ____ Mitigation wetlands; pre-construction
3. ____ Mitigation wetlands; post-construction
4. ____ Other _____

8. **Wetland size:** (total acres) 0.04 (visually estimated)
0.04 (measured, e.g. by GPS [if applies])

9. **Assessment area (AA):** (acres, see instructions on determining AA) 0.04 (visually estimated)
0.04 (measured, e.g. by GPS [if applies])

10. **Classification of Wetland and Aquatic Habitats in AA**

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Riverine	EM	—	SI	100%

Abbreviations: (*see manual for definitions*)

HGM Classes: Riverine (**R**), Depressional (**D**), Slope (**S**), Mineral Soil Flats (**MSF**), Organic Soil Flats (**OSF**), Lacustrine Fringe (**LF**);

Cowardin Classes: Rock Bottom (**RB**), Unconsolidated bottom (**UB**), Aquatic Bed (**AB**), Unconsolidated Shore (**US**), Moss-lichen Wetland (**ML**), Emergent Wetland (**EM**), Scrub-Shrub Wetland (**SS**), Forested Wetland (**FO**)

Modifiers: Excavated (**E**), Impounded (**I**), Diked (**D**), Partly Drained (**PD**), Farmed (**F**), Artificial (**A**)

Water Regimes: Permanent / Perennial (**PP**), Seasonal / Intermittent (**SI**), Temporary / Ephemeral (**TE**)

11. **Estimated relative abundance:** (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
(Circle one) Unknown Rare Common (Abundant)

12. **General condition of AA:**
i. **Disturbance:** (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) lists)

Conditions within AA	*Predominant conditions adjacent to (within 500 feet of) AA*		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	low disturbance	(low disturbance)	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc.):

ii. **Prominent noxious, aquatic nuisance, & other exotic vegetation species:** Spp in wl are native

iii. **Provide brief descriptive summary of AA and surrounding land use/habitat:** Riverine fringe wl; Roads adjoin W side

13. **Structural Diversity:** (based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes], see #10 above)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	(M)	←NO	YES→	L
1 class, monoculture (1 species comprises ≥90% of total cover)	L	NA	NA	NA

Comments: 90% Carex vesicaria

SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (**list species**)	(D) S	Bull trout (LT)
Secondary habitat (**list species**)	D S	
Incidental habitat (**list species**)	D S	
No usable habitat	S	

ii. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	(1H)	.9H	.8M	.7M	.3L	.1L	0L

Sources for documented use (e.g. observations, records, etc): Same as WL1

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (**list species**)	(D) S	West Slope Cutthroat Trout (S2) - year round resident
Secondary habitat (**list species**)	D S	
Incidental habitat (**list species**)	D S	
No usable habitat	S	

ii. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	(.9H)	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use (e.g. observations, records, etc.): Same as WL1

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (circle substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):
- __ observations of abundant wildlife #s or high species diversity (during any period)
- __ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- __ presence of extremely limiting habitat features not available in the surrounding area
- __ interviews with local biologists with knowledge of the AA

Minimal (based on any of the following [check]):
- __ few or no wildlife observations during peak use periods
- __ little to no wildlife sign
- __ sparse adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):
- ✓ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- __ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- __ adequate adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, circle appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	(H)	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	(High)	Moderate	Low
Substantial	1E	~~9H~~	.8H	.7M
Moderate	.9H	(.7M)	.5M	.3L
~~**Minimal**~~	.6M	.4M	.2L	.1L

Comments:

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then circle **NA** here and proceed to 14E.)

Type of Fishery: Cold Water (**CW**) X Warm Water (**WW**)____ **Use the CW or WW guidelines in the user manual to complete the matrix**

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [circle] the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
Aquatic hiding / resting / escape cover	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA: MFWP

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* (Y) N *If yes, reduce score in* ***i*** *above by 0.1:*_____

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? Y (N) *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*_____

iii. Final Score and Rating: 0.3 **Comments:**

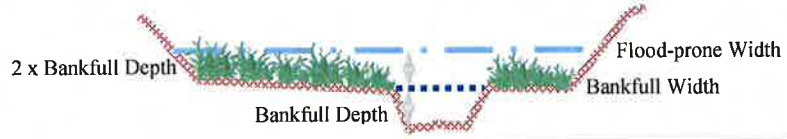
14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle **NA** here and proceed to 14F.)

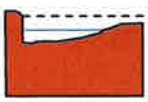
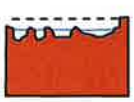
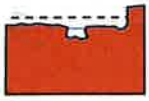
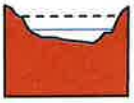
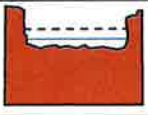
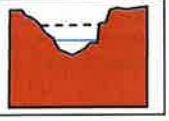
i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched – B stream type			Entrenched-A, F, G stream types		
% of flooded wetland classified as forested and/or scrub/shrub	~~75%~~	~~25-75%~~	~~<25%~~	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no outlet or restricted outlet**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	(.5M)	.7M	.6M	.4M	.3L	.2L	.1L

Entrenchment ratio (ER) estimation – see User's Manual for additional guidance. Entrenchment ratio = (flood-prone width)/(bankfull width)
Flood-prone width = estimated horizontal projection of where 2 x maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
Flood-prone width *Bankfull width* *Entrenchment ratio (ER)*



Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						

ii. Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (circle)? Y (N) **Comments:**

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, circle **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ **5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	(.3L)	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, circle **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: Same as WL 1

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, circle **NA** here and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

*% Cover of **wetland** streambank or shoreline by species with stability ratings of ≥6 (see **Appendix F**).*	*Duration of surface water adjacent to rooted vegetation*		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: Carex is generally a 9

14I. Production Export/Food Chain Support:

***i.* Level of Biological Activity** (synthesis of wildlife and fish habitat ratings [circle])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.7M	.8H	.5M	.6M	.4M	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.5M	.5M	.3L	.3L	.2L
T/E/ A	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? Y (N) *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:*_____

iv. Final Score and Rating: _____ **Comments:**

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators
- ____ The AA is a slope wetland
- ____ Springs or seeps are known or observed
- ____ Vegetation growing during dormant season/drought
- ____ Wetland occurs at the toe of a natural slope
- ____ Seeps are present at the wetland edge
- ____ AA permanently flooded during drought periods
- ____ Wetland contains an outlet, but no inlet
- ____ Shallow water table and the site is saturated to the surface
- ____ Other:_____

ii. Recharge Indicators
- ____ Permeable substrate present without underlying impeding layer
- ____ Wetland contains inlet but no outlet
- ____ Stream is a known 'losing' stream; discharge volume decreases
- ____ Other:_____

Same as WL 1

iii. Rating (use the information from i and ii above and the table below to arrive at [circle] the functional points and rating)

Criteria	**Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM***			
	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	N/A			

Comments:

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7M	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (circle) **Y** (**N**) (if 'Yes' continue with the evaluation; if 'No' then circle **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ___ Educational/scientific study; ___ Consumptive rec.; ___ Non-consumptive rec.; ___Other

iii. Rating (use the matrix below to arrive at [circle] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S):_____

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	H	1	1		
B. MT Natural Heritage Program Species Habitat	H	0.9	1		
C. General Wildlife Habitat	M	0.7	1		
D. General Fish Habitat	M	0.3	1		
E. Flood Attenuation	M	0.5	1		
F. Short and Long Term Surface Water Storage	L	0.3	1		
G. Sediment/Nutrient/Toxicant Removal	M	0.4	1		
H. Sediment/Shoreline Stabilization	H	0.9	1		
I. Production Export/Food Chain Support	M	0.5	1		
J. Groundwater Discharge/Recharge	L	0.1			
K. Uniqueness	L	0.3	1		
L. Recreation/Education Potential (bonus points)	N/A	N/A	NA		
Totals:		5.9	11		
Percent of Possible Score			54 %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- X Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ___ Score of 1 functional point for Uniqueness; **or**
- ___ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ___ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ___ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ___ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ___ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ___ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ___ Score of .9 functional point for Uniqueness; **or**
- ___ Percent of possible score > 65% (round to nearest whole #).

Category III Wetland: (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)
- ___ "Low" rating for Uniqueness; **and**
- ___ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ___ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA RATING: (circle appropriate category based on the criteria outlined above) **I** **II** **III** **IV**

Photo 1. West terminus of South Avenue, looking west at stand of deciduous trees along proposed bridge alignment

Photo 2. Right (east) bank of Bitterroot River, looking upstream

Photo 3. Wetland 1 on right bank of Bitterroot River

Photo 4. Approximate location of proposed bridge alignment across the Bitterroot River, looking west at left bank

Photo 5. West bank of Bitterroot River in vicinity of proposed bridge alignment, looking downstream

Photo 6. Wetland 2 on left bank of Bitterroot River, looking downstream

Photo 7. Confluence of O'Brien Creek and Bitterroot River looking upstream on left bank of Bitterroot River.

Photo 8.O'Brien Creek, looking upstream at confluence with Bitterroot River.

	
Photo 9. Maclay Bridge, looking at right bank abutments	Photo 10. Maclay Bridge, looking across Bitterroot River at left bank.

APPENDIX D:

USFWS Threatened, Endangered, and Candidate Species List by County

USFWS Information for Planning and Conservation (IPaC) Trust Resources Report

MNHP Species Ranking Codes

Montana Noxious Weed List

United States Department of the Interior
Fish and Wildlife Service
Ecological Services
Montana Field Office
585 Shepard Way, Suite 1
Helena, Montana 59601-6287
Phone: (406) 449-5225, Fax: (406) 449-5339

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES
MONTANA COUNTIES*
Endangered Species Act

November 25, 2016

C = Candidate
LT = Listed Threatened
LE = Listed Endangered
P = Proposed
PCH = Proposed Critical Habitat
CH = Designated Critical Habitat
XN = Experimental non-essential population

*Note: Generally, this list identifies the counties where one would reasonably expect the species to occur, not necessarily every county where the species is listed

County/Scientific Name	Common Name	Status
BEAVERHEAD		
Spiranthes diluvialis	Ute Ladies' Tresses	LT
Ursus arctos horribilis	Grizzly Bear	LT
Lynx canadensis	Canada Lynx	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
BIG HORN		
Mustela nigripes	Black-footed Ferret	LE
BLAINE		
Scaphirhynchus albus	Pallid Sturgeon	LE
Mustela nigripes	Black-footed Ferret	LE
Charadrius melodus	Piping Plover	LT, CH
BROADWATER		
Spiranthes diluvialis	Ute Ladies' Tresses	LT
Lynx canadensis	Canada Lynx	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
CARBON		
Lynx canadensis	Canada Lynx	LT, CH
Ursus arctos horribilis	Grizzly Bear	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C

County/Scientific Name	Common Name	Status
CARTER		
Grus americana	Whooping Crane	LE
Myotis septentrionalis	Northern Long-eared Bat	LT
CASCADE		
Scaphirhynchus albus	Pallid Sturgeon	LE
Lynx canadensis	Canada Lynx	LT
Calidris canutus rufa	Red Knot	LT
Charadrius melodus	Piping Plover	LT, CH
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
CHOUTEAU		
Scaphirhynchus albus	Pallid Sturgeon	LE
Lynx canadensis	Canada Lynx	LT
Charadrius melodus	Piping Plover	LT, CH
Calidris canutus rufa	Red Knot	LT
Pinus albicaulis	Whitebark Pine	C
CUSTER		
Scaphirhynchus albus	Pallid Sturgeon	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Myotis septentrionalis	Northern Long-eared Bat	LT
DANIELS		
Grus americana	Whooping Crane	LE
Charadrius melodus	Piping Plover	LT, CH
DAWSON		
Scaphirhynchus albus	Pallid Sturgeon	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Charadrius melodus	Piping Plover	LT
Myotis septentrionalis	Northern Long-eared Bat	LT
DEER LODGE		
Salvelinus confluentus	Bull Trout	LT, CH
Ursus arctos horribilis	Grizzly Bear	LT
Lynx canadensis	Canada Lynx	LT
Calidris canutus rufa	Red Knot	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
FALLON		
Grus americana	Whooping Crane	LE
Myotis septentrionalis	Northern Long-eared Bat	LT
Charadrius melodus	Piping Plover	LT, CH
FERGUS		
Scaphirhynchus albus	Pallid Sturgeon	LE
Lynx canadensis	Canada Lynx	LT

County/Scientific Name	Common Name	Status
FLATHEAD		
Salvelinus confluentus	Bull Trout	LT, CH
Ursus arctos horribilis	Grizzly Bear	LT
Silene spaldingii	Spalding's Campion	LT
Lynx canadensis	Canada Lynx	LT, CH
Coccyzus americanus	Yellow-billed cuckoo (western pop.)	LT
Gulo gulo luscus	Wolverine	P
Lednia tumana	Meltwater Lednian Stonefly	C
Pinus albicaulis	Whitebark Pine	C
GALLATIN		
Spiranthes diluvialis	Ute Ladies' Tresses	LT
Lynx canadensis	Canada Lynx	LT, CH
Ursus arctos horribilis	Grizzly Bear	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
GARFIELD		
Scaphirhynchus albus	Pallid Sturgeon	LE
Grus americana	Whooping Crane	LE
Charadrius melodus	Piping Plover	LT, CH
Sterna antillarum athalassos	Interior Least Tern	LE
GLACIER		
Ursus arctos horribilis	Grizzly Bear	LT
Lynx canadensis	Canada Lynx	LT, CH
Salvelinus confluentus	Bull Trout	LT, CH
Gulo gulo luscus	Wolverine	P
Lednia tumana	Meltwater Lednian Stonefly	C
Pinus albicaulis	Whitebark Pine	C
GOLDEN VALLEY		
Lynx canadensis	Canada Lynx	LT
Calidris canutus rufa	Red Knot	LT
GRANITE		
Lynx canadensis	Canada Lynx	LT, CH
Ursus arctos horribilis	Grizzly Bear	LT
Salvelinus confluentus	Bull Trout	LT, CH
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
HILL		
JEFFERSON		
Spiranthes diluvialis	Ute Ladies' Tresses	LT
Lynx canadensis	Canada Lynx	LT
Ursus arctos horribilis	Grizzly Bear	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
JUDITH BASIN		
Lynx canadensis	Canada Lynx	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C

County/Scientific Name	Common Name	Status
LAKE		
Ursus arctos horribilis	Grizzly Bear	LT
Howellia aquatilis	Water Howellia	LT
Silene spaldingii	Spalding's Campion	LT
Lynx canadensis	Canada Lynx	LT, CH
Salvelinus confluentus	Bull Trout	LT, CH
Coccyzus americanus	Yellow-billed cuckoo (western pop.)	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
Lednia tumana	Meltwater Lednian Stonefly	C
LEWIS AND CLARK		
Ursus arctos horribilis	Grizzly Bear	LT
Lynx canadensis	Canada Lynx	LT, CH
Salvelinus confluentus	Bull Trout	LT, CH
Calidris canutus rufa	Red Knot	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
LIBERTY		
Calidris canutus rufa	Red Knot	LT
LINCOLN		
Acipenser transmontanus	White Sturgeon (Kootenai River Pop.)	LE
Ursus arctos horribilis	Grizzly Bear	LT
Silene spaldingii	Spalding's Campion	LT
Lynx canadensis	Canada Lynx	LT, CH
Salvelinus confluentus	Bull Trout	LT, CH
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
MADISON		
Spiranthes diluvialis	Ute Ladies' Tresses	LT
Lynx canadensis	Canada Lynx	LT
Ursus arctos horribilis	Grizzly Bear	LT
Calidris canutus rufa	Red Knot	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
McCONE		
Scaphirhynchus albus	Pallid Sturgeon	LE
Charadrius melodus	Piping Plover	LT, CH
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
MEAGHER		
Lynx canadensis	Canada Lynx	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
MINERAL		
Lynx canadensis	Canada Lynx	LT
Salvelinus confluentus	Bull Trout	LT, CH
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C

County/Scientific Name	Common Name	Status
MISSOULA		
Ursus arctos horribilis	Grizzly Bear	LT
Howellia aquatilis	Water Howellia	LT
Lynx canadensis	Canada Lynx	LT, CH
Salvelinus confluentus	Bull Trout	LT, CH
Coccyzus americanus	Yellow-billed cuckoo (western pop.)	LT
Calidris canutus rufa	Red Knot	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
MUSSELSHELL		
PARK		
Lynx canadensis	Canada Lynx	LT, CH
Ursus arctos horribilis	Grizzly Bear	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
PETROLEUM		
Scaphirhynchus albus	Pallid Sturgeon	LE
Calidris canutus rufa	Red Knot	LT
PHILLIPS		
Scaphirhynchus albus	Pallid Sturgeon	LE
Charadrius melodus	Piping Plover	LT, CH
Mustela nigripes	Black-footed Ferret	LE, XN
Grus americana	Whooping Crane	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Calidris canutus rufa	Red Knot	LT
PONDERA		
Charadrius melodus	Piping Plover	LT
Ursus arctos horribilis	Grizzly Bear	LT
Lynx canadensis	Canada Lynx	LT, CH
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
POWDER RIVER		
Grus americana	Whooping Crane	LE
Scaphirhynchus albus	Pallid Sturgeon	LE
Myotis septentrionalis	Northern Long-eared Bat	LT
POWELL		
Ursus arctos horribilis	Grizzly Bear	LT
Lynx canadensis	Canada Lynx	LT, CH
Salvelinus confluentus	Bull Trout	LT, CH
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
PRAIRIE		
Scaphirhynchus albus	Pallid Sturgeon	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Myotis septentrionalis	Northern Long-eared Bat	LT
Charadrius melodus	Piping Plover	LT, CH

County/Scientific Name	Common Name	Status
RAVALLI		
Salvelinus confluentus	Bull Trout	LT, CH
Lynx canadensis	Canada Lynx	LT
Coccyzus americanus	Yellow-billed cuckoo (western pop.)	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
RICHLAND		
Scaphirhynchus albus	Pallid Sturgeon	LE
Charadrius melodus	Piping Plover	LT, CH
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Myotis septentrionalis	Northern Long-eared Bat	LT
ROOSEVELT		
Scaphirhynchus albus	Pallid Sturgeon	LE
Charadrius melodus	Piping Plover	LT, CH
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Calidris canutus rufa	Red Knot	LT
Myotis septentrionalis	Northern Long-eared Bat	LT
ROSEBUD		
Sterna antillarum athalassos	Interior Least Tern	LE
Scaphirhynchus albus	Pallid Sturgeon	LE
Grus americana	Whooping Crane	LE
SANDERS		
Ursus arctos horribilis	Grizzly Bear	LT
Lynx canadensis	Canada Lynx	LT
Salvelinus confluentus	Bull Trout	LT, CH
Silene spaldingii	Spalding's Campion	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
SHERIDAN		
Charadrius melodus	Piping Plover	LT, CH
Grus americana	Whooping Crane	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Calidris canutus rufa	Red Knot	LT
SILVER BOW		
Salvelinus confluentus	Bull Trout	LT
Ursus arctos horribilis	Grizzly Bear	LT
Lynx canadensis	Canada Lynx	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
STILLWATER		
Lynx canadensis	Canada Lynx	LT, CH
Ursus arctos horribilis	Grizzly Bear	LT
Charadrius melodus	Piping Plover	LT, CH
Calidris canutus rufa	Red Knot	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C

County/Scientific Name	Common Name	Status
SWEET GRASS		
Lynx canadensis	Canada Lynx	LT, CH
Ursus arctos horribilis	Grizzly Bear	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
TETON		
Ursus arctos horribilis	Grizzly Bear	LT
Lynx canadensis	Canada Lynx	LT, CH
Calidris canutus rufa	Red Knot	LT
Charadrius melodus	Piping Plover	LT, CH
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
TOOLE		
Calidris canutus rufa	Red Knot	LT
TREASURE		
No listings at this time		
VALLEY		
Scaphirhynchus albus	Pallid Sturgeon	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Charadrius melodus	Piping Plover	LT, CH
Calidris canutus rufa	Red Knot	LT
WHEATLAND		
Lynx canadensis	Canada Lynx	LT
Gulo gulo luscus	Wolverine	P
Pinus albicaulis	Whitebark Pine	C
WIBAUX		
Scaphirhynchus albus	Pallid Sturgeon	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Myotis septentrionalis	Northern Long-eared Bat	LT
Charadrius melodus	Piping Plover	LT, CH
YELLOWSTONE		
Grus americana	Whooping Crane	LE
Calidris canutus rufa	Red Knot	LT

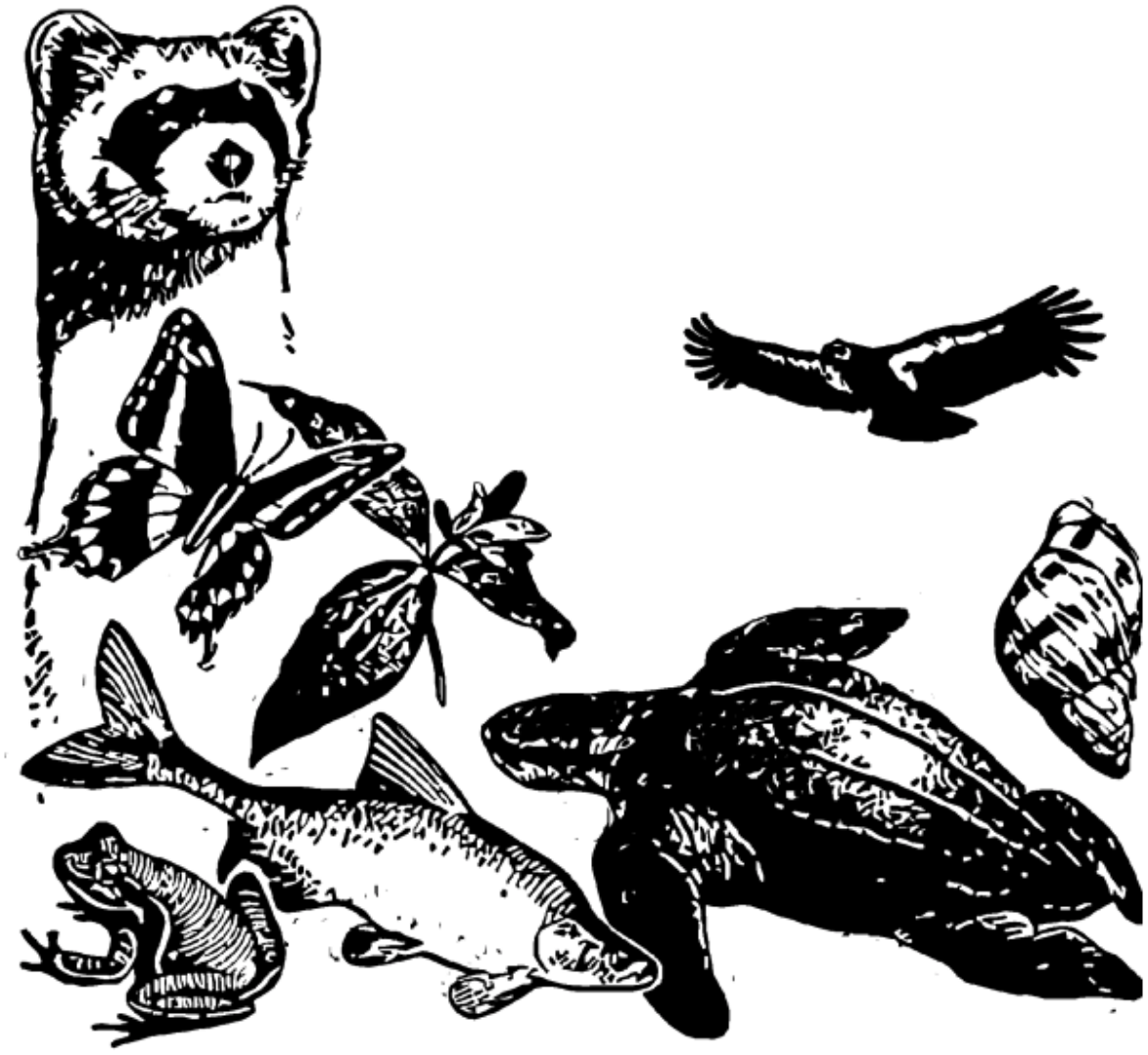
U.S. Fish & Wildlife Service

South Ave Bridge

IPaC Trust Resources Report

Generated August 18, 2016 05:03 PM MDT, IPaC v3.0.8

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

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U.S. Fish & Wildlife Service

IPaC Trust Resources Report

NAME

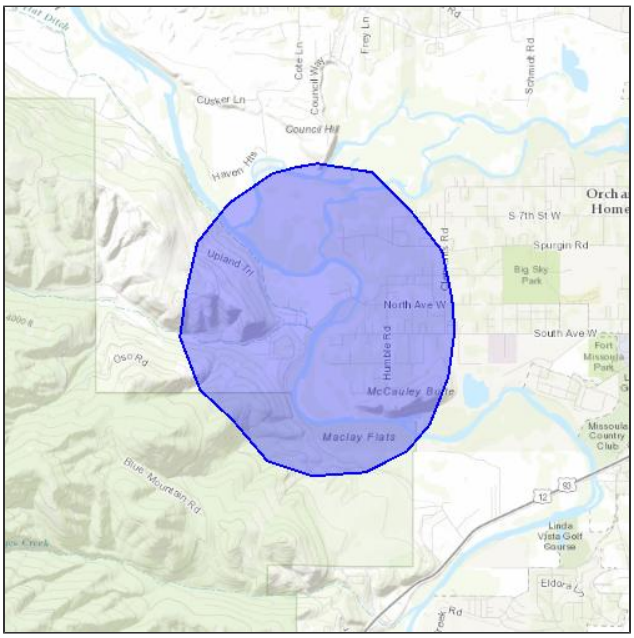
South Ave Bridge

LOCATION

Missoula County, Montana

IPAC LINK

https://ecos.fws.gov/ipac/project/5RMFL-QGAJN-FJBLZ-W7J4M-Q5UXSI



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Montana Ecological Services Field Office
585 Shepard Way, Suite 1
Helena, MT 59601-6287
(406) 449-5225

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Yellow-billed Cuckoo Coccyzus americanus — Threatened

CRITICAL HABITAT

There is **proposed** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06R

Fishes

Bull Trout Salvelinus confluentus — Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E065

Mammals

Canada Lynx Lynx canadensis — Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A073

North American Wolverine Gulo gulo luscus — Proposed Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0FA

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

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1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The following species of migratory birds could potentially be affected by activities in this location:

American Bittern Botaurus lentiginosus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F3

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Black Rosy-finch Leucosticte atrata — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J4

Black Swift Cypseloides niger — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FW

Brewer's Sparrow Spizella breweri — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HA

Calliope Hummingbird Stellula calliope — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0K3

Cassin's Finch Carpodacus cassinii — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J6

Flammulated Owl Otus flammeolus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DK

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Breeding

Golden Eagle Aquila chrysaetos — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DV

Grasshopper Sparrow Ammodramus savannarum — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0G0

Lewis's Woodpecker Melanerpes lewis — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HQ

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S

Olive-sided Flycatcher Contopus cooperi — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0AN

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Rufous Hummingbird selasphorus rufus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0E1

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Swainson's Hawk Buteo swainsoni — Bird of conservation concern

Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B070

Western Grebe aechmophorus occidentalis — Bird of conservation concern

Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EA

Williamson's Sapsucker Sphyrapicus thyroideus — Bird of conservation concern

Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FX

Willow Flycatcher Empidonax traillii — Bird of conservation concern

Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F6

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

Freshwater Emergent Wetland

PEM1A
PEM1Ax
PEM1C
PEM1Cx

Freshwater Forested/shrub Wetland

PSSA

Freshwater Pond

PABF
PUBFx

Riverine

R2UBF
R2UBH
R2USA
R2USC
R4SBC
R4SBCx
R5UBFx
R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website: http://107.20.228.18/decoders/wetlands.aspx

Montana Species Ranking Codes

Montana employs a standardized ranking system to denote **global** (range-wide) and **state** status (NatureServe 2006). Species are assigned numeric ranks ranging from 1 (highest risk, greatest concern) to 5 (demonstrably secure), reflecting the relative degree of risk to the species' viability, based upon available information.

A number of factors are considered in assigning ranks — the number, size and quality of known occurrences or populations, distribution, trends (if known), intrinsic vulnerability, habitat specificity, and definable threats. The process of assigning state ranks for each taxon relies heavily on the number of occurrences and Species Occurrence (OE) ranks, which is a ranking system of the quality (usually A through D) of each known occurrence based on factors such as size (# of individuals) and habitat quality. The remaining factors noted above are also incorporated into the ranking process when they are known. The "State Rank Reason" field in the Montana Field Guide provides additional information on the reasons for a particular species' rank.

Rank		Definition
G1	**S1**	At high risk because of **extremely limited** and/or **rapidly declining** population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state.
G2	**S2**	At risk because of **very limited** and/or **potentially declining** population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.
G3	**S3**	Potentially at risk because of **limited** and/or **declining** numbers, range and/or habitat, even though it may be abundant in some areas.
G4	**S4**	Apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining.
G5	**S5**	Common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range.
GX	**SX**	Presumed Extinct or Extirpated - Species is believed to be extinct throughout its range or extirpated in Montana. Not located despite intensive searches of historical sites and other appropriate habitat, and small likelihood that it will ever be rediscovered.
GH	**SH**	Historical, known only from records usually 40 or more years old; may be rediscovered.
GNR	**SNR**	Not Ranked as of yet.
GU	**SU**	Unrankable - Species currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
GNA	**SNA**	A conservation status rank is not applicable for one of the following reasons: 1) The taxa is of Hybrid Origin; is Exotic or Introduced; is Accidental or 2) is Not Confidently Present in the state. (see other codes below)

Combination or Range Ranks

G#G# or **S#S#**	Indicates a range of uncertainty about the status of the species *(e.g., G1G3 = Global Rank ranges between G1 and G3).*

S#, S#	Indicates that populations in different geographic portions of the species' range in Montana have a different conservation status *(e.g., S1 west of the Continental Divide and S4 east of the Continental Divide).*

Sub-rank

T# Rank of a subspecies or variety. Appended to the global rank of the full species, *e.g. G4T3*

Qualifiers

Q	**Questionable** taxonomy that may reduce conservation priority-Distinctiveness of this entity as a taxon at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority (numerically higher) conservation status rank. Appended to the global rank, *e.g. G3Q*
?	**Inexact Numeric Rank** - Denotes uncertainty; inexactness.
HYB	**Hybrid** - Entity not ranked because it represents an interspecific hybrid and not a species.
C	**Captive or Cultivated Only** - Species at present exists only in captivity or cultivation, or as a reintroduced population not yet established.
A	**Accidental** - Species is accidental or casual in Montana, in other words, infrequent and outside usual range. Includes species (usually birds or butterflies) recorded once or only a few times at a location. A few of these species may have bred on the few occasions they were recorded.
SYN	**Synonym** - Species reported as occurring in Montana, but the Montana Natural Heritage Program does not recognize the taxon; therefore the species is not assigned a rank.
B	**Breeding** - Rank refers to the breeding population of the species in Montana. Appended to the state rank, *e.g. S2**B**,S5N = At risk during breeding season, but common in the winter*
N	**Nonbreeding** - Rank refers to the non-breeding population of the species in Montana. Appended to the state rank, *e.g. S5B,S2**N** = Common during breeding season, but at risk in the winter*
M	**Migratory** - Species occurs in Montana only during migration.

Montana Noxious Weed List

Effective: July 2015

PRIORITY 1A These weeds are not present or have a very limited presence in Montana. Management criteria will require eradication if detected, education, and prevention:

(a) Yellow starthistle (*Centaurea solstitialis*)
(b) Dyer's woad *(Isatis tinctoria*)
(c) Common Reed *(Phragmites australis ssp. australis)*

PRIORITY 1B These weeds have limited presence in Montana.
Management criteria will require eradication or containment and education:

(a) Knotweed complex (*Polygonum cuspidatum, P. sachalinense, P. × bohemicum, Fallopia japonica, F. sachalinensis, F. × bohemica, Reynoutria japonica, R. sachalinensis, and R.× bohemica*)
(b) Purple loosestrife (*Lythrum salicaria*)
(c) Rush skeletonweed (*Chondrilla juncea*)
(d) Scotch broom (*Cytisus scoparius*)

PRIORITY 2A These weeds are common in isolated areas of Montana. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts:

(a) Tansy ragwort (*Senecio jacobaea, Jacobaea vulgaris*)
(b) Meadow hawkweed complex (*Hieracium caespitosum, H. praealturm, H. floridundum, and Pilosella caespitosa*)
(c) Orange hawkweed (*Hieracium aurantiacum, Pilosella aurantiaca*)
(d) Tall buttercup (*Ranunculus acris*)
(e) Perennial pepperweed (*Lepidium latifolium*)
(f) Yellowflag iris (*Iris pseudacorus*)
(g) Blueweed (*Echium vulgare*)
(h) Eurasian watermilfoil (*Myriophyllum spicatum*)
(i) Flowering rush (*Butomus umbellatus*)

PRIORITY 2B These weeds are abundant in Montana and widespread in many counties. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts:

(a) Canada thistle (*Cirsium arvense*)
(b) Field bindweed (*Convolvulus arvensis*)
(c) Leafy spurge (*Euphorbia esula*)
(d) Whitetop (*Cardaria draba, Lepidium draba*)
(e) Russian knapweed (*Acroptilon repens, Rhaponticum repens*)
(f) Spotted knapweed (*Centaurea stoebe, C.maculosa*)
(g) Diffuse knapweed (*Centaurea diffusa*)
(h) Dalmatian toadflax (*Linaria dalmatica*)
(i) St. Johnswort (*Hypericum perforatum*)
(j) Sulfur cinquefoil (*Potentilla recta*)
(k) Common tansy (*Tanacetum vulgare*)
(l) Oxeye daisy (*Leucanthemum vulgare*)
(m) Houndstongue (*Cynoglossum officinale*)
(n) Yellow toadflax (*Linaria vulgaris*)
(o) Saltcedar (*Tamarix spp*.)
(p) Curlyleaf pondweed (*Potamogeton crispus*)
(q) Hoary alyssum (*Berteroa incana*)

Priority 3 Regulated Plants: (NOT MONTANA LISTED NOXIOUS WEEDS)
These regulated plants have the potential to have significant negative impacts. The plant may not be intentionally spread or sold other than as a contaminant in agricultural products. The state recommends research, education and prevention to minimize the spread of the regulated plant.

(a) Cheatgrass (*Bromus tectorum*)
(b) Hydrilla (*Hydrilla verticillata*)
(c) Russian olive (*Elaeagnus angustifolia*)
(d) Brazilian waterweed (*Egeria densa*)
(e) Parrot feather watermilfoil (*Myriophyllum aquaticum or M. brasiliense*)