Biological Assessment

For the Federal Highway Administration

Mullan BUILD Project

Missoula County, Montana
July 30, 2020

Prepared for:

D, J & A
3203 South Russell Street
Missoula, MT 59801

Prepared by:

HDR
700 SW Higgins Ave, Ste. 200
Missoula, MT 59803

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1 Introduction

In 2019, Missoula County, in partnership with the City of Missoula, was awarded $13 million through the Better Utilizing Investments to Leverage Development, or BUILD, Transportation Discretionary Grant program to construct transportation improvements in the Mullan area at the western edge of the city of Missoula. The purpose of this Biological Assessment (BA) is to assess the effects of a construction project proposed by the City of Missoula and Missoula County (City/County), in cooperation with the Federal Highway Administration (FHWA), on federally-listed, proposed, and candidate species in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended.

1.1 Federal Nexus

Section 7 of the ESA of 1973 (as amended) directs federal agencies to ensure that actions they authorize, fund, and/or conduct are not likely to jeopardize the continued existence of any federally-proposed or listed species, or result in destruction or adverse modification of critical habitat for such species. Section 7(c) of the ESA requires that federal agencies contact the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) before beginning any construction activity to determine if federally-listed threatened and endangered (T&E) species or designated critical habitat may be present in the vicinity of a proposed project. A BA must be prepared if actions by a federal agency, or permits issued by a federal agency, will result in effects to T&E species that occur in the vicinity of a proposed project. With respect to the proposed action, the FHWA is the federal agency funding the project. The proposed project is anticipated to require a federal Clean Water Act (CWA) Section 404 permit.

1.2 Project Location and Background

The general study area is located at the western edge of Missoula, Montana, and is partially located within the City of Missoula limits. The study area is approximately bound by West Broadway Street (State Highway 10) to the north, Reserve Street (US 93) to the east, Mullan Road to the south, and Grant Creek and Missoula International Airport to the west. The study area is located within portions of Sections 6, 7, and 18 of Township 13 North, Range 19 West and Sections 10, 11, 12, and 13 of Township 13 North, Range 20 West. The general study area is shown in Figure 1-1 as represented by the Mullan Master Plan study boundary.

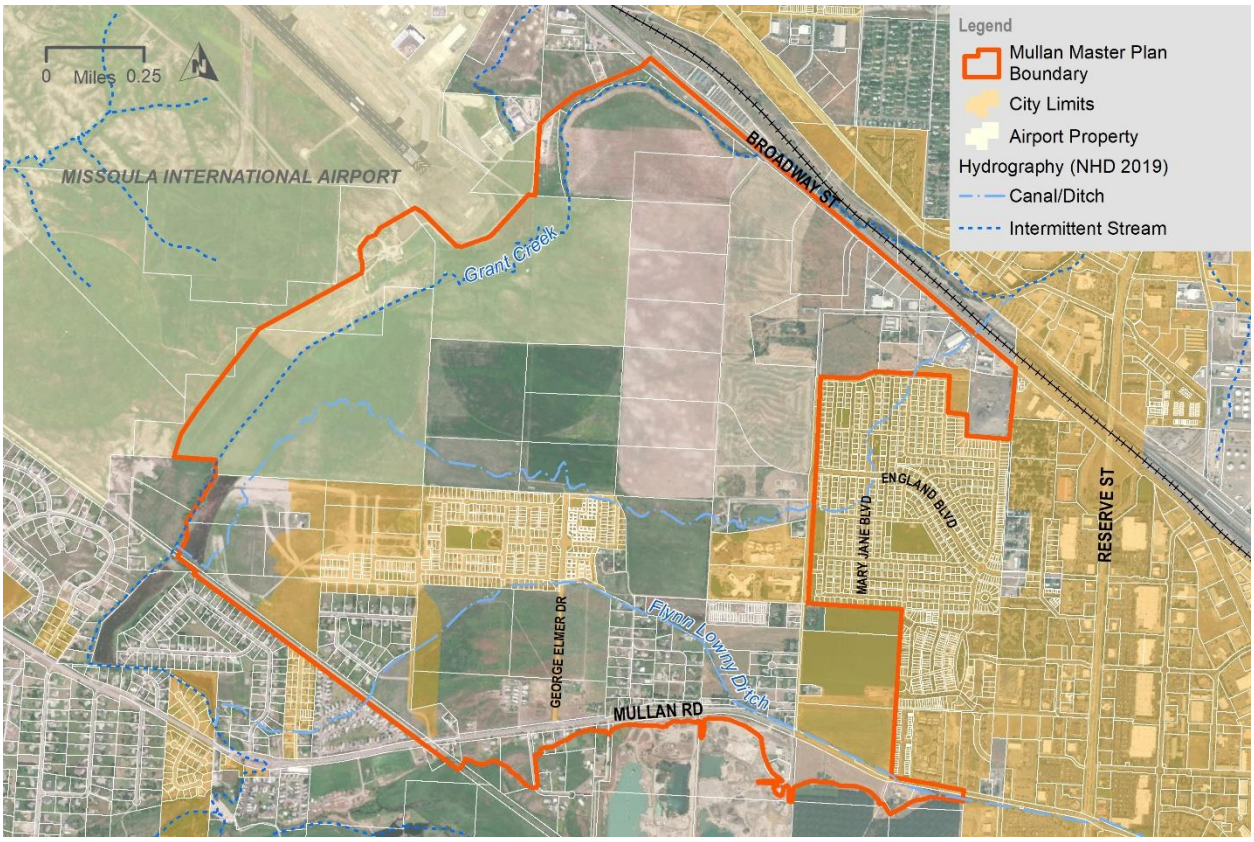

Figure 1-1. Project Location Overview Map

The overall scope of the project as described in the BUILD application includes design and construction of three miles of new collector and minor arterial roadway, new sewer and water infrastructure, 3.7 miles of new trails, and 0.5 mile of stream restoration and flood control along Grant Creek. The transportation infrastructure is necessary to proactively plan development in a responsible manner, improve traffic flows and reduce congestion, create safer corridors for bicyclists and pedestrians, and attract economic development.

The proposed project includes eight main project elements as described in the 2019 grant application and as shown and described below. Figure 1-2 depicts the eight project elements and is followed by a description of each.

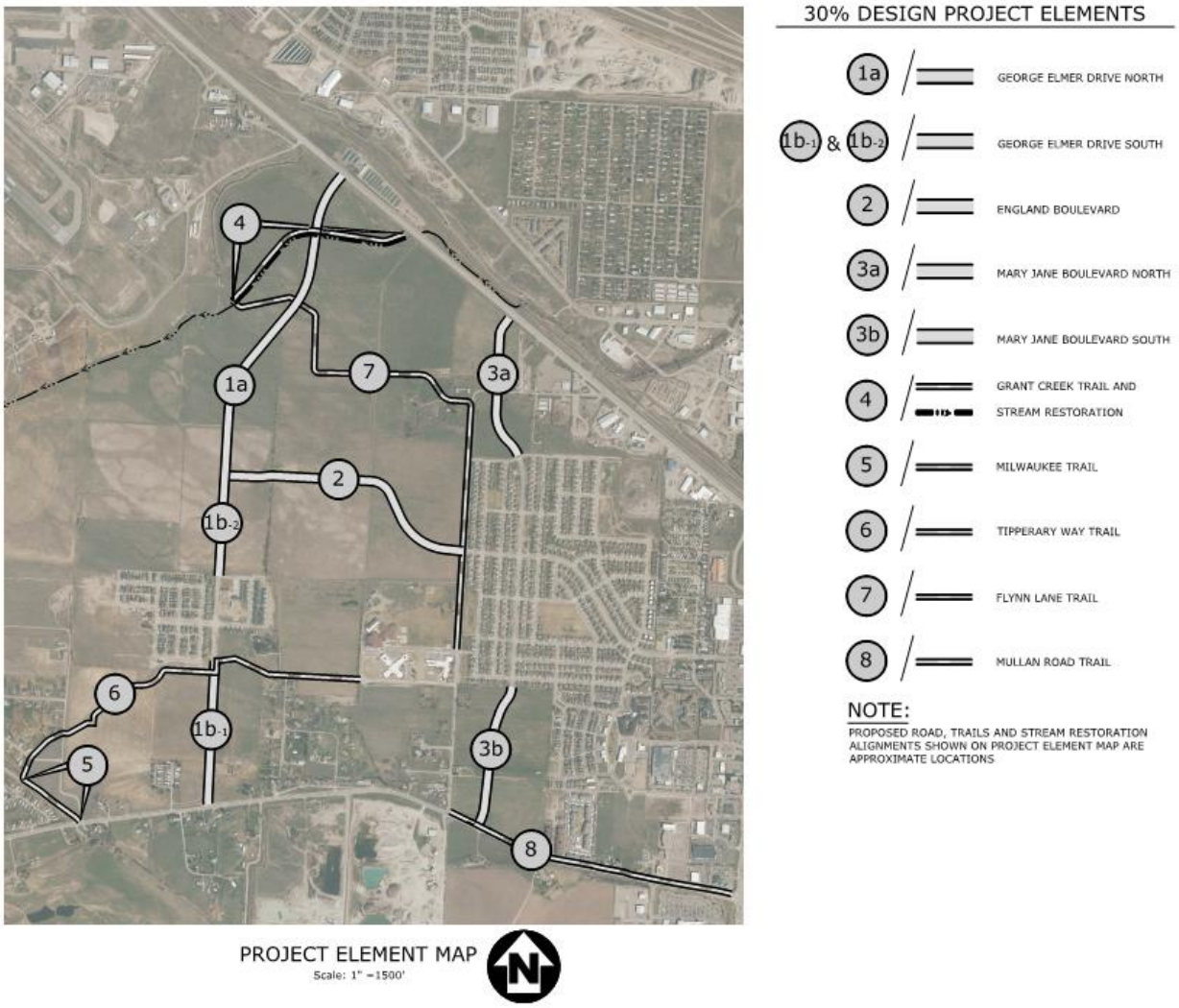

Figure 1-2. Mullan BUILD Project Elements

1. **George Elmer Dr:** Completes a new street connection between Mullan Road and Broadway, extending the existing section of road to Broadway and upgrading the existing section to the south. Includes a traffic signal or roundabout at its intersection with Mullan Road (including necessary Mullan Road widening/turn lanes east and west of the new intersection control), a bridge over Grant Creek, a traffic signal or roundabout at its intersection with Broadway, and related utility infrastructure.
2. **England Blvd:** Extends a new street from Flynn Lane to George Elmer Dr, extending England Blvd to the west from its current dead end at Flynn Lane. Includes a roundabout at its intersection with George Elmer Dr, a roundabout or traffic calming at its intersection with Mary Jane Blvd, and related utility infrastructure.
3. **Mary Jane Blvd:** Completes a new street connection between Mullan Road and Broadway, extending the existing section of road from current dead ends on both the north and south. Includes a traffic signal or roundabout at its intersection with Mullan (including necessary Mullan Road widening/turn lanes east and west of the new

intersection control), a traffic signal or roundabout at its intersection with Broadway, and related utility infrastructure.

4. **Grant Creek Restoration and Trail:** Restores 2,800 feet of stream channel and floodplain to return Grant Creek to a natural condition. Also, extends a new shared-use path along the restored Grant Creek corridor, linking to future connections with the Milwaukee Trail and trail connections north of Broadway.
5. **Milwaukee Trail:** Extends a new shared-use path from Mullan Road to Grant Creek, which is part of a planned trail system extending over 120 miles into eastern Idaho along the former Milwaukee & St. Paul Railroad.
6. **Tipperary Way Trail:** Extends a new shared-use path connecting residential development to Hellgate School along the Flynn Irrigation Ditch.
7. **Flynn Lane Trail:** Extends the existing shared-use path north along Flynn Lane, connecting Hellgate School to the Grant Creek trail corridor.
8. **Mullan Trail:** Extends the existing Mullan Road shared-use path the final 0.75 miles from Flynn Lane to Reserve Street.

Occurring concurrently with the Mullan BUILD design project, Missoula County is conducting the Mullan Area Master Plan, a public planning and design process for the study area that is intended to identify future land use planning and regulations, transportation elements, and plans for amenities through community and stakeholder engagement. The final Mullan Area Master Plan, expected to be complete towards the end of 2020, will provide an illustrative plan meant to help guide future development in the area.

1.3 Proposed Action

The $13 million awarded for this project was only a portion of the $23.2 million requested from the Federal BUILD program in the 2019 grant application. As a result of partial funding, the entire project will not be able to be constructed using Federal dollars as originally proposed in the 2019 grant application. The City/County are committed to constructing all of the project elements included in the BUILD grant request but, due to the approximate $10M shortfall in funding, the City/County must prioritize which project elements will be delivered with the grant funding that is currently available and which elements will be delayed until future funding becomes available.

To that end, an evaluation committee comprised of government officials and industry experts ranked the ten project elements (both elements 1 and 2 include two separate north-south segments) based on evaluation criteria related to safety, traffic congestion, access to land for economic development, transportation modes, and environmental considerations. Based on the evaluation results, the following five elements have been selected as providing the greatest public benefit and are therefore the proposed scope of the federal project and are shown in Figure 1-3.

1. Mary Jane Boulevard South;
2. Mary Jane Boulevard North;
3. George Elmer Drive South;
4. England Boulevard; and
5. Flynn Lane Trail.

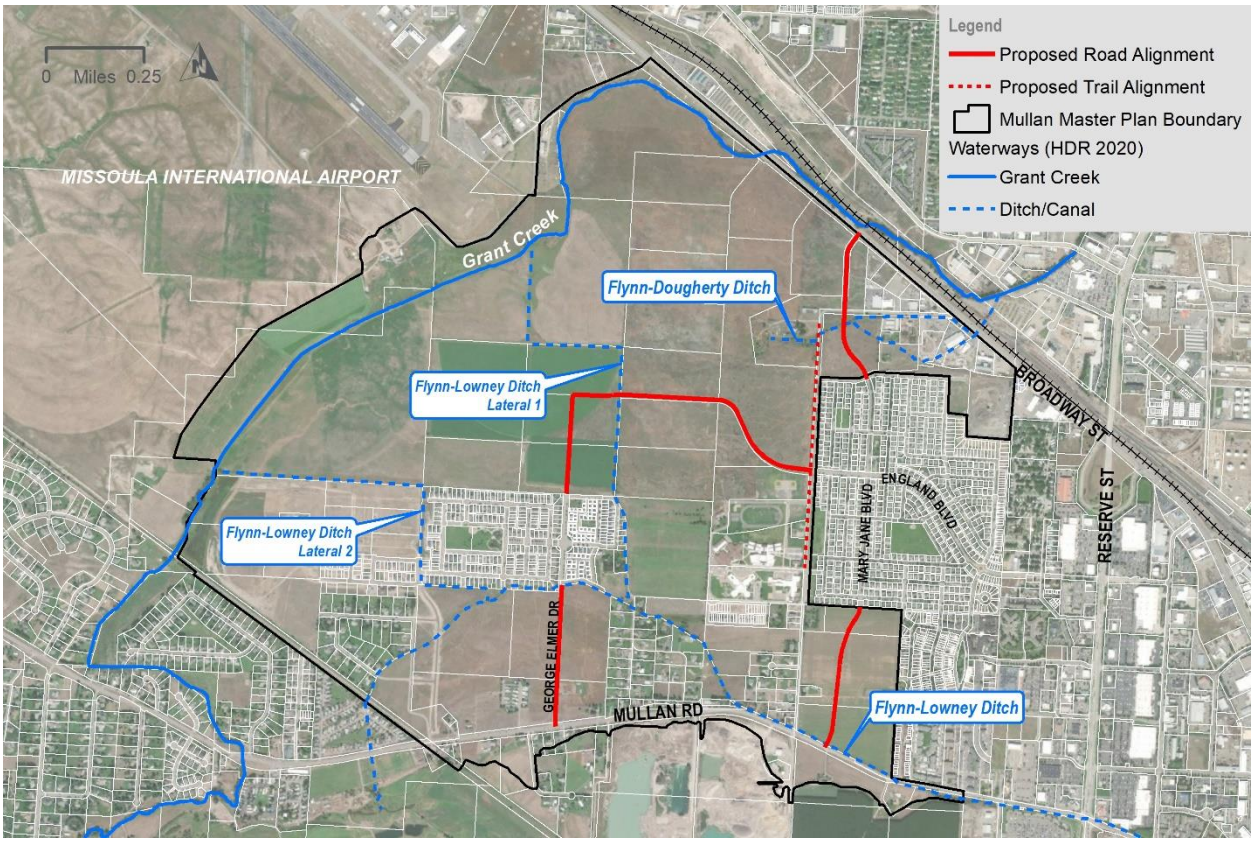

Figure 1-3. Proposed Project Elements

1.3.1 Mary Jane Boulevard South and North

The proposed Mary Jane Boulevard South and North project elements would construct a roadway connecting to the existing Mary Jane Boulevard within the Pleasant View subdivision. The south portion of the roadway would begin with a new intersection with Mullan Road, cross over the Flynn-Lowney Ditch, and proceed northward through vacant agricultural fields. A large parcel of land immediately south of the existing subdivision is currently being developed. On the north end of the subdivision, the northern portion of the proposed roadway would pass through a vacant field, cross the Flynn-Dougherty Ditch, intersect with Flynn Lane, and then travels northward to a new intersection with West Broadway Street. The total width of the roadway including sidewalk and landscaped boulevard varies from 82 for the south portion to 89 feet for the north portion. When completed, the new Mary Jane Boulevard will create a new north-south minor arterial roadway that connects West Broadway Street to Mullan Road.

1.3.2 George Elmer Drive South

The proposed George Elmer Drive South project element would improve the existing George Elmer Drive south of the existing 44 Ranch Estates subdivision to include a complete street typical section, then construct a new roadway north of the subdivision to connect to the

proposed England Boulevard. The total width of the new roadway including sidewalk and landscaped boulevard is 84 feet.

1.3.3 England Boulevard

The proposed England Boulevard project element would construct a new east-west extension from the existing terminus of England Boulevard at Flynn Lane to connect to the proposed George Elmer Drive. The proposed England Boulevard would cross the Flynn-Lowney Lateral 1. The total width of the new roadway including sidewalk and landscaped boulevard is 84 feet.

1.3.4 Flynn Lane Trail

The proposed Flynn Lane Trail is approximately 3340 feet long and begins on the west side of Flynn Lane, North of Camden Street. This trail terminates at the existing shared use path near Hellgate Elementary School. The trail is all within right-of-way yet to be dedicated. This trail contains no horizontal curves or design constraints/concerns.

1.3.5 Conservation Measures

The proposed project would avoid and/or minimize effects to natural resources in the project area through the following conservation measures and best management practices (BMPs):

- Culvert installations at the irrigation ditch crossings should be timed to occur “in the dry” to the maximum extent possible. Construction timing of these crossings should occur during a period when the ditches are not flowing to avoid and minimize the transport of sediments during construction. Stabilize disturbed channel banks using appropriate BMPs.
- Clearing and grubbing should not be allowed within the right-of-way (ROW) beyond the construction limits or required clear zone. Any temporary clearing outside the construction limits (e.g. for culvert installation, etc.) but within the ROW should be kept to the smallest area possible and reclaimed immediately following construction.
- Install barriers (e.g., silt fences) at appropriate locations adjacent to waterways and ditches prior to grading to prevent sediment from leaving the site and entering downstream conveyances via runoff.
- Implement preventive measures, such as watering or covering exposed soils, to minimize the wind transport of soils.
    - Restrict the length of time soils are allowed to remain unprotected.
    - Stabilize exposed soils with a vegetative cover or other erosion control treatment immediately following construction.
- Develop, implement, and maintain a Stormwater Pollution Prevention Plan (SWPPP) to minimize erosion of sediments due to rainfall runoff at construction sites, and to reduce, eliminate, and prevent the pollution of storm water.
    - Perform routine inspections of erosion-control and sediment-control BMPs and subsequent BMP maintenance.

- Develop, implement, and maintain 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).
    - 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.

2 Action Area and Environmental Baseline

2.1 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 ground disturbance activities to construct the transportation infrastructure improvements, culvert installations crossing the Flynn-Lowney Ditch and laterals, construction noise, and operation of the new facilities.

For purposes of this assessment, the project action area includes both a terrestrial and an aquatic action area. The terrestrial action area is defined as an area extending one-quarter mile beyond the proposed roadways described in Section 1.3 and an area extending 100 feet from the proposed Flynn Lane Trail. The aquatic action area is defined as the bed and banks of Grant Creek extending from where the Flynn-Lowney Ditch Lateral 1 joins the creek downstream approximately 6,800 feet (1.3 miles) to Hiawatha Road. The aquatic area also includes the Flynn-Lowney Ditch from the proposed crossing of Mary Jane Boulevard downstream approximately 7,900 feet (1.5 miles) to Hiawatha Road; the Flynn-Lowney Ditch Lateral 1 from the proposed crossing of England Boulevard downstream approximately 3,200 feet (0.6 mile) to Grant Creek; and the Flynn-Lowney Ditch Lateral 2 from the main Flynn-Lowney Ditch downstream approximately 1 mile to Grant Creek. The aquatic action area represents a conservative downstream effects area where sediments could mobilize from upstream irrigation ditch crossings by the proposed project. The action area is shown in Figure 2-1, which encompasses all proposed project components.

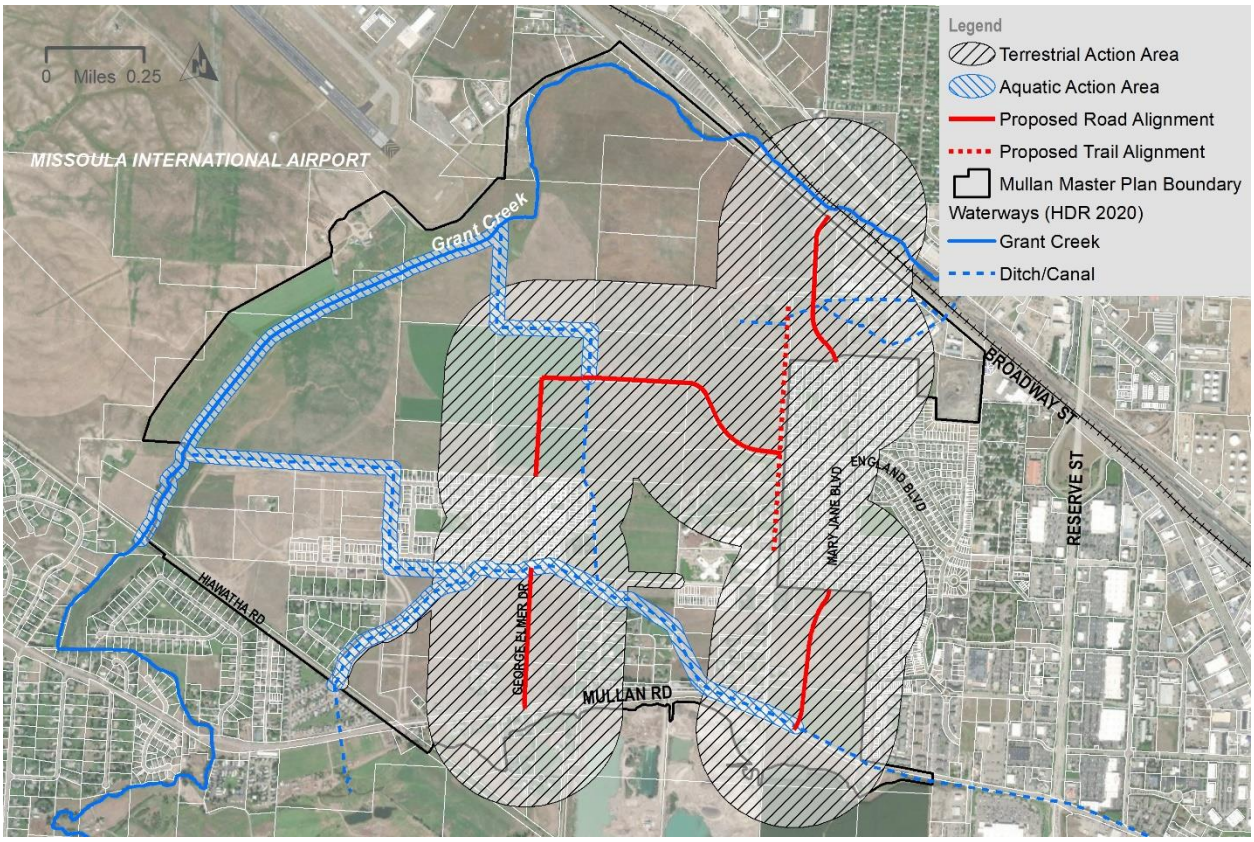

Figure 2-1. Project Action Area

2.2 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. A field investigation was conducted on May 26-27, 2020 that consisted of a detailed inventory of potential wetlands and streams in the study area as well as general documentation on the vegetative communities and wildlife habitat within the general study area.

2.2.1 Project Setting

The proposed project is located at the western edge of the City of Missoula in a predominantly rural setting. The action area is flanked on the east by the dense commercial and residential development located along Reserve Street including the relatively new Pleasant View subdivision centered along England Boulevard. To the north, the action area is bound by West Broadway Street and Montana Rail Link. Commercial and industrial businesses are located along West Broadway Street, including the planned Summit Beverage and Veterans Hospital facilities. A relatively new subdivision called 44 Ranch is located approximately 0.4 mile north of Mullan Road on George Elmer Drive. The action area includes the Hellgate District 4 K-8 school located on Flynn Lane. Several large, vacant parcels are currently under development within the action area.

Land Use and Land Ownership

The action area includes mostly residential and agricultural uses. As previously noted, institutional uses include the Hellgate School. The action area is bound by intermittent commercial and industrial uses along West Broadway Street and Mullan Road. The action area is predominantly privately owned. The Missoula County Airport Authority owns the land that bounds the western edge of the action area.

Vegetation and Land Cover Type

Alfalfa is the primary hay species grown in the study area with other haylands being comprised of various grasses including smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), slender wheatgrass (*Elymus trachycaulus*), Kentucky bluegrass (*Poa pratensis*), timothy (*Phleum pretense*), and meadow foxtail (*Alopecurus pratensis*). Moist areas adjacent to irrigation ditches and Grant Creek support reed canary grass (*Phalaris arundinacea*), field horsetail (*Equisetum arvense*), mint (*Mentha arvensis*), cattail (*Typha latifolia*), and bulrush (*Schoenoplectus acutus*).

Disturbed ground around field edges, irrigation ditches, roads, and Grant Creek support a variety of noxious weeds and invasive species including: spotted knapweed (*Centaurea stoebe*), Canada thistle (*Cirsium arvense*), musk thistle (*Cardus nutans*), common tansy (*Tanacetum vulgare*), cheatgrass (*Bromus tectorum*), houndstongue (*Cynoglossum officinale*), leafy spurge (*Euphorbia esula*), common mullein (*Verbascum thapsus*), and common kochia (*Kochia scoparia*). Noxious weeds and other weedy species are prominent on the landscape and are associated with most disturbed ground in the study area.

Aside from a variety of ornamental trees and shrubs associated with private homes in the study area, the only other trees and shrubs in the study area are associated with irrigation ditches and Grant Creek. Mature black cottonwood (*Populus balsamifera*) trees are limited in the study area but do persist along the creek and along some irrigation ditches. Occasional willows documented in the study area include sandbar willow (*Salix exigua*), crack willow (*Salix gragilis*), and Bebb's willow (*Salix bebbiana*). Other shrubs species include chokecherry (*Prunus virginiana*), black hawthorn (*Crataegus douglasii*), red-osier dogwood (*Cornus alba*), common snowberry (*Symphoricarpos albus*), and woods rose (*Rosa woodsii*). A small number of Russian olive (*Elaeagnus angustifolia*) trees occur within the study area as well.

The Montana Natural Heritage Program (MTNHP) Land Cover database (MTNHP 2016) was reviewed to provide general land cover types located in the project area vicinity. The majority of the fields are classified as either Cultivated Crops or Pasture/Hay land cover under the Agriculture ecological system. Some areas within the project area are identified as Rocky Mountain Lower Montane, Foothill, and Valley Grassland land cover under the Montane Grassland ecological system. The remaining area is classified as some form of Developed, Human Land Use land cover type.

Wildlife

The open farmland associated with the study area supports a variety of mammal species including Columbian ground squirrels (*Urocitellus columbianus*), which are widespread throughout the study area, red fox (*Vulpes vulpes*), coyote (*Canis latrans*), white-tailed deer (*Odocoileus virginianus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and domestic cats and dogs. Bird species in the study area are those adapted to open farmland habitat and those associated with water features such as Grant Creek and the numerous

irrigation ditches. Species observed during the field investigation include: American Robin (*Turdus migratorius*), House Sparrow (*Passer domesticus*), Mourning Dove (*Zenaida macroura*), European Starling (*Sturnus vulgaris*), Red-tailed Hawk (*Buteo jamaicensis*), Mallard (*Anas platyrhynchos*), Great Blue Heron (*Ardea herodias*), Bank Swallow (*Riparia riparia*), Tree Swallow (*Tachycineta bicolor*), Red-winged Blackbird (*Agelaius phoeniceus*), and Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*). Reptiles likely to occur in the study area include common garter snake (*Thamnophis sirtalis*), bullsnake (*Pituophis catenifer*), and western terrestrial garter snake (*Thamnophis elegans*). Spotted frogs (*Rana luteiventris*) were observed in the study area during field investigations and other amphibians with potential to occur in the study area include northern leopard frog (*Rana pipiens*) and western toad (*Bufo boreas*).

Grant Creek

The action area includes approximately 1.3 miles of Grant Creek between where the Flynn-Lowney Ditch Lateral 1 joins Grant Creek to Hiawatha Road. Grant Creek has been significantly altered and channelized downstream of I-90. The creek has been impacted by construction of I-90, past gravel mining activities, flow diversion for irrigation, and other land use and development activities. Most notable within the study area, Grant Creek has been realigned in the area of the "horseshoe bend," a deeply incised section of the creek with eroding banks, from its original alignment. Grant Creek within the study area has a narrow fringe of vegetation along the horseshoe bend segment, but it otherwise is largely void of riparian vegetation, a likely result of agricultural and grazing practices that have occurred. Downstream of I-90, a number of bridges and culverts that carry Grant Creek under various roads are undersized. Upstream of I-90, Grant Creek is relatively undisturbed with an active channel width ranging between 16 to 18 feet. At Mullan Road, the upstream watershed area of Grant Creek was measured to be 29.5 square miles. Grant Creek is a tributary to the Clark Fork River and is shown and labeled in Figure 1-1.

Grant Creek is a perennial stream in its upper reaches north of I-90 but only flows intermittently April through July south of I-90 and through the study area, where flows reach the Clark Fork River. Within the study area, flows within the creek go subsurface in the summer through winter. Occasionally, the Grant Creek channel picks up irrigation flows in various reaches during the summer. Peak flows are estimated to be between 538 cubic feet per second (cfs) for the 50-year event and 864 cfs for the 500-year event (HDR 2020). Grant Creek is listed on the Montana Department of Environmental Quality's (DEQ) 303(d) list for impaired water bodies. DEQ has issued Total Maximum Daily Loads (TMDLs) for Grant Creek that include sediment, temperature, and nutrients.

Grant Creek in the study area primarily serves as a migratory corridor for fish moving upstream from the Clark Fork River and back downstream, which only occurs in the spring months when flows are sustained in the creek. Montana Fish, Wildlife & Parks (FWP) surveys suggests numerous fish use Grant Creek in the study area during this time. Primary species include rainbow trout (*Oncorhynchus mykiss*), westslope cutthroat trout (*Oncorhynchus clarkii lewisi*), cutbows (*Oncorhynchus clarkii* × *mykiss*), and suckers (*Catostomus spp.*) (FWP 2020a). A review of the MT FWP MFISH database indicates that, in addition to the above-mention species, Grant Creek is also inhabited by brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), bull trout (*Salvelinus confluentus*) (see Section 3.6.2), and mountain whitefish (*Prosopium williamsoni*) (FWP 2020b). In forested reaches upstream of I-90, Grant Creek supports a substantial population of genetically pure westslope cutthroat trout and bull trout (FWP 2020a).

Irrigation Ditches

The Flynn-Lowney Ditch

The Flynn-Lowney Ditch originates at a river diversion along the north side of the Clark Fork River between the Orange Street and Russell Street bridges. The water is conveyed along Mullan Road to just west of Flynn Lane where the ditch travels in a northwesterly then southwesterly direction through the study area. The Flynn-Lowney Ditch ranges from approximately 6 to 20 feet wide and has near vertical banks. The vast majority of the ditch as observed within the study area is un-vegetated. The vegetation along the banks of the ditch typically consists of upland grasses and concentrations of weeds, with the exception of a few various locations where wetland vegetation (i.e., *Carex spp*., *Schoenoplectus spp*.) was observed along the inside of the ditch banks.

The Flynn-Lowney Ditch exits the study area at approximately the Hiawatha Road. The terminus of the Flynn-Lowney Ditch was not field-verified; however, based on aerial imagery interpretation, it appears to travel to the south side of Mullan Road and connect to a complex of side channels and sloughs of the Clark Fork River. The Flynn-Lowney Ditch is crossed by the proposed southern extension of Mary Jane Boulevard.

Flynn-Lowney Lateral 1

This ditch is a narrow lateral ditch ranging approximately 3 to 6 feet in width that begins at a diversion of the Flynn-Lowney Ditch just west of George Elmer Drive. The lateral ditch flows in a northerly direction for approximately 170 feet, turns west for 880 feet, flows north for 0.25 mile, then flows west approximately 0.5 mile into Grant Creek. This lateral is crossed by the project by the extension of England Boulevard. The north-south segment of the ditch that is crossed by the proposed extension of England Boulevard contained water during the field investigation, although the ditch was not flowing.

Flynn-Lowney Lateral 2

This ditch is a lateral ditch ranging approximately 4 to 10 feet in width that begins at a diversion of the Flynn-Lowney Ditch near Tipperary Way, just east of George Elmer Drive. The lateral ditch flows in a northerly direction for approximately 0.7 mile, turns west for .25 mile, then flows north for 0.25 mile and flows into Grant Creek. This lateral is not crossed by any transportation element of the project; however, there is potential that the ditch conveyance flowing west from the 44 Ranch subdivision could be used to convey stormwater from George Elmer Drive. This ditch was actively conveying water westward and flowing into Grant Creek during the field investigation.

Flynn-Dougherty Ditch

The Flynn-Dougherty Ditch originates at a diversion along Grant Creek on the north side of West Broadway Street and conveys irrigation water to the Dougherty farm property located on Flynn Lane. Within the general study area, the ditch is narrow, approximately 2 feet wide, and contained water during the field investigation, although the ditch was not flowing. This ditch is crossed by the proposed northern extension of Mary Jane Boulevard. From a review of aerial imagery, it appears this ditch terminates on the Dougherty farm property. Historical imagery reviewed in GoogleEarth shows a small impoundment on the farm property at the terminus of the ditch measuring approximately 0.05 acre. The impoundment area was not visited during the field investigations as no proposed elements of the project would affect this feature.

3 Threatened and Endangered Species Biological Assessment

Section 7 of the 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 Biological Assessment of the proposed action's effect on federally-listed species and designated critical habitats.

3.1 Methods

Information reported within this section was obtained from a review of literature and database searches and on-site field review of the project area occurring on May 26-27, 2020. A list of federally-listed endangered, threatened, proposed, and candidate species to be considered for this project was generated based on the USFWS data. The December 12, 2019 publication of *Endangered, Threatened, Proposed and Candidate Species Montana Counties* available through the USFWS's Montana Ecological Field Office (USFWS 2020a) was reviewed to determine the federally-listed species potentially occurring in Missoula County. Federally-listed species potentially occurring in Missoula County are listed in Table 3-1 along with their respective federal status, and potential for occurrence in the project area. The action area was examined using the USFWS Information for Planning and Consultation (IPaC) tool to refine the list of species that could potentially occur in the project area and identify critical habitat in the vicinities of the project (USFWS 2020b).

Table 3-1. Federally-Listed Species Occurring in Missoula County, MT

Common Name	Scientific Name	Status[a]	Critical Habitat in Action Area?	Potential Occurrence in Action Area? [b]
Canada Lynx	*Lynx canadensis*	LT	No	Yes
Grizzly Bear	*Ursus arctos horribilis*	LT	No	Yes
Bull Trout	*Salvelinus confluentus*	LT	Yes	Yes
Wolverine	*Gulo gulo luscus*	P	No	Yes
Whitebark Pine	*Pinus albicaulis*	C	No	No
Water Howellia	*Howellia aquatilis*	LT	No	No
Yellow-billed Cuckoo (western pop.)	*Coccyzus americanus*	LT	No	Yes
Red Knot	*Calidris canutus rufa*	LT	No	No

Sources: USFWS 2020a, USFWS 2020b
[a] LT = Listed Threatened; P = Proposed; C = Candidate
[b] Potential occurrence/affect according to IPaC report (USFWS 2020b)

Based on results from the IPaC for species potentially affected by the proposed project, the following species were considered with respect to this BA:

- Canada lynx (*Lynx Canadensis*, threatened) and designated critical habitat;

- Grizzly bear (*Ursus arctos horribilis*, threatened);
- Wolverine (*Gulo luscus*, proposed);
- Yellow-billed cuckoo (*Coccyzus americanus*, threatened); and,
- Bull trout (*Salvelinus confluentus*, threatened) and designated critical habitat.

Due to the lack of suitable habitat and no documented occurrences of the species within the project area, water howellia, whitebark pine, and red knot were eliminated from detailed consideration in this BA. None of these species are documented to occur within or in the vicinity of the project area. The proposed action will have ***No Effect*** on the federally-threatened water howellia and red knot, and is ***Not Likely to Jeopardize the Continued Existence*** of the candidate whitebark pine.

3.2 Canada Lynx

3.2.1 Species status, distribution, habitat requirements, reasons for decline

The Canada lynx (*Lynx canadensis*) was listed as threatened under the ESA in 2000 (65 FR 16053 16086), and critical habitat was designated on November 9, 2006, and revised on February 24, 2009 and again on September 12, 2014. Critical habitat includes substantial areas of boreal forests in northwestern Montana and the Greater Yellowstone Ecosystem.

In general, lynx distribution in North America is closely associated with the distribution of North American boreal forest. 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).

Among the general forest types, lynx are most likely to persist in areas that receive deep snow and have high-density populations of snowshoe hares, the principal prey of lynx. 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 (Ruediger et al. 2000). Without high densities of snowshoe hares, lynx are unable to sustain populations despite utilizing a multitude of other prey when snowshoe hare numbers are low.

Reasons for decline include incompatible land uses such as timber harvest and recreation and related activities. The primary factor that caused the lynx to be listed was the lack of guidance for the conservation of lynx and snowshoe hare habitat in plans for federally managed lands (USFWS 2017c).

3.2.2 Occurrence in Project Area

A review of the MTNHP Generalized Observations database indicates no Canada lynx observations in the immediate project area vicinity. Nearest to the action area, the MTNHP reports a single historic observation that was recorded between June 15, 1962 and August 15, 1962 near Waterworks Hill on the north side of Missoula, approximately 4 miles southeast of the project action area (MTNHP 2020a). No other observations of Canada lynx have been documented in the project vicinity.

Lynx likely occupy remote areas at much higher elevations within surrounding Lolo National Forest lands. Designated Canada lynx critical habitat exists approximately 6 miles to the northeast within Lolo National Forest and the Rattlesnake Wilderness Area. However, the action area lacks suitable habitat for Canada lynx, including the preferred typical denning and foraging habitat above 4,000 feet as described above. Due to the lack of suitable habitat and urbanization, Canada lynx are not expected to occur in the project area vicinity.

3.2.3 Potential Impact Analysis

Construction activities associated with the proposed project would have no impact on Canada lynx. Canada lynx are not documented in the project area vicinity and no impact on Canada lynx suitable habitat would occur.

3.2.4 Conservation Measures

No specific conservation measures are recommended at this time with respect to Canada lynx.

3.2.5 Determination of Effect

Based on the above information, it has determined that the proposed project would have ***no effect*** on Canada lynx and ***no effect*** on Canada lynx critical habitat.

3.3 Grizzly Bear

3.3.1 Species status, distribution, habitat requirements, reasons for decline

The grizzly bear (*Ursus arctos horribilis*) was listed as threatened under the ESA in 1975 in the conterminous 48 states (40 FR 31734). Habitat loss and human encroachment are the primary reasons for decline in grizzly bear populations (Reel et al. 1989). Presently, there are five regions where grizzlies are known to occur: Yellowstone ecosystem, Northern Continental Divide ecosystem (NCDE), Cabinet-Yaak ecosystem, Selkirk ecosystem, and Northern Cascades ecosystem. On June 30, 2017, the Greater Yellowstone Ecosystem (GYE) population of grizzly bears was removed from the federal list of endangered and threatened species. On September 24, 2018, the Montana District Court issued an order that vacate the 2017 delisting rule and remanded it back to the USFWS. A final rule was published on July 31, 2019 to comply with the court order reinstating that any and all grizzly bears in the GYE are once again listed as a threatened species under the ESA. As a result, all grizzly bears on the lower 48 states are currently protected as threatened.

Grizzly bears are wide-ranging mammals requiring large areas of undisturbed habitat. Grizzlies occupy a wide range of habitat types and elevations throughout the year and will opportunistically occupy areas that can best meet their food requirements. Grizzlies prefer habitat that is forested and provides good cover (USFWS 1993). 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).

According to Kendall et. al. (2009), in 1998 and 2000 an estimated mean population of 241 grizzly bears occupied what was then termed the Greater Glacier Area. An increasing trend in grizzly bear numbers continued and in 2004 the estimated number had increased to 765

individuals (Kendall et. al. 2009). By 2016, an estimated 1,800 grizzlies resided in the lower 48 states.

The project area is located south and outside of the southwest boundary of the Northern Continental Divide Grizzly Bear Recovery Zone. The NCDE Grizzly Bear Recovery Zone encompasses approximately 9,600 square miles extending from the Rattlesnake Wilderness north of Missoula to the northern border of Glacier National Park. Noninvasive hair sampling DNA analysis conducted in 2004 within the recovery zone and adjacent occupied habitat outside the recovery zone (10-mile buffer) supported the estimate of 765 grizzly bears in the NCDE (Kendall et al. 2009). The greatest densities occurred in Glacier National Park in the north and the lowest densities were in the southern reaches of the study area (Kendall et al. 2009). Additional population monitoring through radio collar studies between 2004 and 2014 indicate that the NCDE grizzly population was increasing at a rate of 2.3 percent per year. According to Kasworm et. al. (2013), over an eight-year period from 2005 through 2012, ten grizzly bears including seven females and three males were removed from the NCDE and moved to the Cabinet-Yaak Grizzly Bear Recovery Area to augment that population of grizzly bears. Despite the deliberate removals, the annual growth rate in the NCDE remained unchanged. In 2014, the estimated grizzly population in the NCDE was approximately 960 bears and in 2015, 982 grizzly bears (Costello et. al. 2017). This stable trend indicates that in the next five years approximately 121 more bears are likely to be recruited into the NCDE regardless of past management removal actions and current levels of illegal, accidental and natural mortalities.

3.3.2 Occurrence in Action Area

A review of the MTNHP database indicates a single historic grizzly bear observation in the vicinity of Missoula that occurred between June 15, 1965 and August 15, 1965 in the Butler Creek drainage approximately five miles north of the project area (MNHP 2020a). On May 16, 2017, a single grizzly was accidentally shot and killed by a black bear hunter in the Johnson Creek drainage near Bonner (a distance greater than 10 miles from the study area) (Missoulian 2017). According to an article printed in the Missoulian (published May 30, 2017), wildlife researchers have occasionally tracked grizzlies around the fringe of the Missoula Valley and they are rarely observed south of the Mission Mountains or Bob Marshall Wilderness.

According to FWP bear biologist, Jaime Jonkel, there has been documented grizzly bear activity within 10 miles of the study area, mostly by the grizzly bear known as “Ethyl”, who has been documented through GPS collar in wide-ranging 2,800-mile wanderings through Montana and Idaho (FWP 2020c). According to Jonkel, a few other collared bears have passed through Missoula’s North Hills. Bear activity in the study area vicinity is limited to black bears moving to and from the Clark Fork River riparian area, Grant Creek, and the North Hills (FWP 2020c).

There are no documented occurrences of grizzly bear in the immediate project area vicinity and their presence is not expected because of the lack of suitable habitat in the study area. The landscape surrounding the study area continues to undergo residential and commercial development both within the city limits and the surrounding county. The study area lacks secure hiding cover for grizzly bears and food sources are limited.

3.3.3 Potential Impact Analysis

Construction of the proposed project would have no impact on grizzly bear. The project location is well outside of any grizzly bear recovery zone. Grizzlies are rare in the greater Missoula Valley and are not documented in the project area vicinity or inhabiting the Missoula urban area. The proposed project would not result in the alteration, degradation, or removal of potential grizzly habitat.

3.3.4 Conservation Measures

No specific conservation measures are recommended at this time with respect to grizzly bear.

3.3.5 Determination of Effect

Based on information presented above, a ***no effect*** determination is rendered relative to the grizzly bear.

3.4 Wolverine

3.4.1 Species status, distribution, habitat requirements, reasons for decline

In February 2013, the USFWS proposed listing the distinct population segment (DPS) of the North American wolverine (*Gulo gulo luscus*) 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 opening a 30-day public comment period on the February 2013 proposed rule to list the DPS of wolverine as threatened. The USFWS has yet to make a formal decision on whether or not the species is warranted for listing based on their most current reviews and public comment.

Preferred habitat for wolverine is limited to alpine tundra, and boreal and mountain forests (primarily coniferous) in the western mountains, especially large wilderness areas (MTNHP 2020b). 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 (MTNHP 2020b).

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).

3.4.2 Occurrence in Project Area

The project area does not include suitable habitat for wolverines. A review of the MTNHP database indicates a single historic observation documented at Marshall Creek in 1932 (MTNHP 2020a). No other observations are documented by the MTNHP. Given the very low population numbers of wolverines and lack of suitable habitat, wolverine are not expected to occur in the vicinity of the proposed project.

3.4.3 Potential Impact Analysis

No impact on wolverine is anticipated as a result of the proposed project. Suitable habitat does not exist in the vicinity of the proposed project and wolverine is not documented to occur in the project vicinity. There would be no effect on the extent or connectivity of suitable habitat for the species.

3.4.4 Conservation Measures

No specific conservation measures are recommended at this time with respect to wolverine.

3.4.5 Determination of Effect

Based on information presented above, the proposed project is ***not likely to jeopardize the continued existence*** of the wolverine.

3.5 Yellow-billed Cuckoo

3.5.1 Species status, distribution, habitat requirements, reasons for decline

The western population of the yellow-billed cuckoo (*Coccyzus americanus)* [YBCU] 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 YBCUs 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. The loss and degradation of native riparian habitat throughout the western YBCU's range have played a major role in the decline of YBCU. In the western states, much of the riparian habitat preferred by the YBCU has been converted to farmland and housing, leading to population declines and the likely extirpation of YBCU from British Columbia, Washington, Oregon, and Nevada (Hughes 2015). As long-distance, nocturnal migrants, YBCUs are vulnerable to collisions with tall buildings, cell towers, radio antennas, wind turbines, and other structures.

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.

Nesting has not been recorded in isolated patches less than two acres or narrow, linear riparian habitats less than 10-20 meters wide (Halterman et al., 2015). However, individual birds have been detected in such isolated patches or linear habitats during migration or the early breeding season (mid-June) (Halterman et al., 2015). The western YBCU is a late season breeder, arriving on their breeding grounds 4 to 8 weeks later than eastern cuckoos (Hughes 2015). Most breeding western YBCU occur on their breeding grounds between mid-June and mid-September (Hughes 2015). In Montana, the YBCU has only been recorded to occur in June and July, and there has been no definitive evidence of breeding in the state (MTNHP 2020b).

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.

3.5.2 Occurrence in Action Area

Only eight sightings have been reported in western Montana since 1959. Most recently in Missoula County, one sighting has been confirmed and includes a single bird that was photographed at 33 Marshall Street within the Missoula city limits in mid-June 2012 that was potentially seen a few days later along Tower Street (USFWS 2015a). The MTNHP also reports a single observation dated July 3, 1980 in the Orchard Homes area. Despite the somewhat recent observation on Marshall Street, the USFWS does not believe there is a breeding population of yellow-billed cuckoos in western Montana. The MTNHP has no recorded observations of yellow-billed cuckoos in the vicinity of the project area (MTNHP 2020a).

Regionally this species is considered a transient migrant in western Montana. Although potential occurrences within the immediate project area are extremely rare, suitable migratory habitat for the species does occur in the Missoula Valley along the nearby Clark Fork River riparian corridor. HDR environmental scientists conducted protocol presence/absence surveys for the YBCU during the period of June 17 through July 30 of 2018 for a bridge replacement project on the Bitterroot River following the USFWS official survey protocol (Halterman et al. 2015). Conditions were favorable for above-average availability of grasshoppers and other preferred food sources and thus the survey period represented a higher than average probability for YBCU to occur in the survey area. Despite this, no YBCU were detected. 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.

3.5.3 Potential Impact Analysis

No impact on YBCU is anticipated as a result of the proposed project. Suitable breeding habitat of adequate size (i.e., 25-acre dense, riparian forest) does not exist within the action area. Impact on vegetation is anticipated to be negligible and would have no effect on suitable riparian habitat potentially used by migrating YBCUs. What does exist in the way of a

very narrow fridge of riparian vegetation along Grant Creek would not be impacted by the proposed project.

The potential for a transient individual to be present during construction is extremely low to non-existent due to the overall lack of species observations in western Montana and lack of suitable habitat. As such, potential impacts on YBCU due to in-air noise from construction activities are not expected to occur.

3.5.4 Conservation Measures

No specific conservation measures are recommended at this time with respect to yellow-billed cuckoo.

3.5.5 Preliminary Determination of Effect

Based on information presented above, a ***no effect*** determination is rendered relative to the yellow-billed cuckoo.

3.6 Bull Trout

3.6.1 Species status, distribution, habitat requirements, reasons for decline

The USFWS defined a single distinct population segment (DPS) for bull trout (*Salvelinus confluentus*) within the conterminous 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 Clark Fork 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.

Spawning areas are often in headwater streams and associated with coldwater springs, groundwater infiltration, and the coldest streams in a given watershed (Rieman and McIntyre 1993). 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.

On October 18, 2010, the USFWS issued a final rule designating critical habitat for bull trout in the conterminous United States (75 FR 63898-64070), and recently developed implementation plans for the final bull trout recovery plan (USFWS 2015b). In the vicinity of

the proposed project, Grant Creek, as well as the Clark Fork River, is included within designated critical habitat for bull trout (Unit 31 Clark Fork River Basin) as part of the Columbia Headwaters Recovery Unit. Grant Creek from its confluence with the Clark Fork River to its approximate headwaters is designated as bull trout critical habitat. In freshwater areas, and generally speaking, 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 ordinary high water mark (OHWM) if bankfull elevation in not evident on either bank (USFWS 2010). The final rule (75 FR 63926) further defines critical habitat to include, “the bed and banks of waterbodies, but actions that may destroy critical habitat could occur on lands adjacent to waterbodies, and, therefore, would be subject to regulation under this rule.”

3.6.2 Occurrence in Project Area

The project area is located within the middle Clark Fork River sub basin, which extends from the historic site of Milltown Dam near the confluence of the Blackfoot River downstream 119 miles to the Flathead River. Bull trout populations in the Clark Fork River are fluvial, meaning that adult fish inhabit the mainstem of the Clark Fork River but migrate to tributary streams to spawn. The current distribution of bull trout in the middle Clark Fork River sub basin has greatly decreased from historic levels. Presently, bull trout in the middle Clark Fork River drainage are uncommon to rare (MDT 2008). Numbers of bull trout within the Milltown reach of the Clark Fork River were estimated in 2008 to be one to two fish per mile.

Grant Creek within the action area primarily serves as a migratory corridor for bull trout moving upstream from the Clark Fork River and back downstream, which only occurs in the spring months when flows are sustained in the creek (FWP 2020a). Bull trout have been documented within Grant Creek within the project action area, but are considered uncommon in this reach of Grant Creek (FWP 2020a). The timing of spring flows does not naturally correspond with bull trout movements, which often occur in late summer and fall. In forested reaches upstream of I-90, Grant Creek supports a year-round population of bull trout (FWP 2020a). FWP MFISH survey data show that bull trout have been documented in 1993 and 2001 at multiple survey locations upstream of the action area (FWP 2020b). No sampling data exists in the MFISH database for Grant Creek within the action area. No data exists that would suggest fish presence within the irrigation ditches present within the action area.

3.6.3 Potential Impact Analysis

Conservation measures described in Section 1.3.5 are intended to avoid or minimize indirect effects to bull trout and bull trout critical habitat.

Potential Effects on Bull Trout

Bull trout habitat in the action area is limited to approximately 1.3 miles of Grant Creek as described in Section 2.1. Bull trout use Grant Creek seasonally in the spring and early summer as a migration corridor between the Clark Fork River and the upper reaches of Grant Creek north of I-90. Because no in-stream work is occurring in Grant Creek under the proposed action, there is no potential for direct mortality of bull trout during construction activities. Because there will be no in-stream work or riparian disturbance along Grant Creek under the proposed action, no work window is deemed necessary. No bull trout spawning habitat occurs in Grant Creek downstream of the project area and none would be impacted by the project.

The proposed extension of England Boulevard crosses the Flynn-Lowney Ditch Lateral 1 ditch, which has a connection to Grant Creek approximately 3,200 feet (0.6 mile) downstream. Similarly, the proposed Mary Jane Boulevard South alignment crosses the Flynn-Lowney Ditch at Mullan Road, which does not appear to have a direct surface connection with the Clark Fork River. At both of these locations, the existing irrigation ditch would be placed in a new culvert underneath the roadway. Per conservation measures described in Section 1.3.5, the culvert installations would occur during a period when the ditches are not flowing as to minimize the potential for transport of sediments during construction.

A sediment concentration and turbidity study was conducted at three locations within three separate National Forests (two in ID and one in WA) studying the water quality effects of culvert replacement and road obliteration (Foltz et al. 2007). The research involved sampling concentrations of sediment and turbidity for 11 culvert removal sites at locations both upstream of the construction project as well as different distance intervals downstream of the projects. The study found that sediment concentrations immediately below the culvert outlet exceeded levels above the culvert outlet by at least three orders of magnitude at all stream crossings. The study also found, among other results, that sediment concentrations an average of 810 meters (2,657 feet) downstream of the culvert outlet were similar to sediment concentrations above the culvert for the entire excavation period. This study suggests that short duration point-source turbidity increases can dissipate with distance from the action.

Increases in turbidity, suspended sediment, and other pollutants can reduce stream productivity, reduce feeding opportunities for fish, severely impact fish gill function, and result in fish avoidance of important habitat. Deposited sediments reduce habitat volume by filling pools and intergravel spaces that are critical to young fish. Construction in the dry will minimize overall sedimentation from construction and will reduce the potential for sediment plumes to migrate through the irrigation ditch into Grant Creek. It is important to note that the irrigation ditches are dirt bottomed (i.e., not lined) and regularly transport sediments downstream during normal operation under the baseline condition. Temporary erosion controls will be utilized to minimize irrigation ditch bank erosion until revegetated. Because bull trout critical habitat is located a distance greater than 3,000 feet downstream of proposed construction activities, and the timing of culvert installations to occur when the ditches are dry, impacts to bull trout from short term construction-related sedimentation in Grant Creek are expected to be minor and negligible.

Potential Effects on Bull Trout Critical Habitat

As previously noted, the proposed project will not involve any in-stream work or disturbance to the bed or banks of bull trout critical habitat (Grant Creek). Indirect impacts to bull trout critical habitat from increased storm water runoff potential due to the increase in impervious surfaces of the proposed roadways are anticipated to be minor. The preliminary storm water management facilities associated with the proposed action are being designed to reduce water quality impacts to Grant Creek and to be consistent with the TMDLs and water quality improvement plan for the area, which recommend loading reductions via full implementation of storm water BMPs consistent with the MS4 General Permit requirements. Due to the TMDLs established for Grant Creek, storm water runoff that discharges towards or into Grant Creek from the Mullan BUILD project will be treated using BMPs that are expected to reduce pollutant loadings.

Storm water management along approximately the western half of the proposed England Boulevard would flow westward towards Grant Creek and consist of inlet/catch basins,

manholes, storm sewer pipe, and potential riparian areas for treatment. Upon reaching the Grant Creek area, the storm sewer network would discharge to an open channel which would then convey runoff to a riparian area immediately adjacent to the Grant Creek channel. The riparian area has not been designed at this preliminary stage; however, it was assumed that this area would be utilized for storm water treatment and flow control (if needed) prior to discharging to Grant Creek. Presently, this preliminary storm water concept does not involve direct impact to or work within Grant Creek.

All other storm water management of the proposed transportation facilities consists of a similar design and would have no impact on Grant Creek. Preliminary roadway storm water management would include conveyance ditches, landscaped depressions that would function as infiltration basins, and subsurface infiltration chambers. The conveyance ditches would be located within the proposed boulevards and storm water would enter the ditches via curb cuts. Storm water would then be conveyed to respective sag locations then flow under respective sidewalks to the landscaped depressions. A drywell would be included with these infiltration basins for additional storage capacity and additional means of infiltration.

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 removed the term “primary constituent elements” from designated critical habitat regulations (50 CFR 424.12) and have returned to the statutory term “physical and biological features” for new critical habitat designations (79FR 27066). However, the elements in bull trout critical habitat are still referred to as PCEs. The following important PCEs are discussed below in relation to the proposed action.

Effects of the proposed action on relevant bull trout indicators (USFWS 1998b) relative to the proposed action is provided in the matrix provided in Table 3-2. Baseline diagnostic/pathway indicators are taken from the USFS Bull Trout Priority Watersheds GIS database for Lolo National Forest (USFS 2008) for the applicable sixth-level hydrologic unit code (HUC) for Grant Creek in which the action area is located.

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

No springs or seeps are known to occur in the project action area. As previously mentioned, flows in Grant Creek within the action area flow subsurface generally after July. No in-water work or direct impact on Grant Creek would occur. Work occurring in irrigation ditches that have direct and indirect connection to Grant Creek would be scheduled to occur during periods no flows to minimize impacts on water quality. No impact on any springs, seeps, groundwater sources, or subsurface water connectivity is anticipated. The proposed project is expected to maintain this PCE.

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.

Insufficient flows within Grant Creek outside the period of approximately April through July constitute a physical and seasonal barrier to migration and use. No impact on migration habitat would occur. The proposed project is expected to maintain this PCE through the project reach.

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

Habitat elements supporting this PCE are presently functioning at unacceptable risk in the action area. Other species of fish are documented in Grant Creek and may provide forage species for subadult and adult bull trout. Data on aquatic macroinvertebrates is unavailable, though benthic macroinvertebrates are likely present to some degree in the action area during periods of sufficient flows. The proposed project is expected to maintain this PCE through the project reach.

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 un-embedded substrates, to provide a variety of depths, gradients, velocities, and structure.

This PCE is functioning at unacceptable risk in the action area. The project reach of Grant Creek is a single, incised channel lacking any geomorphic complexity. Restoration of Grant Creek is currently not proposed under the proposed action. The proposed project is expected to maintain this PCE through the project reach.

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; stream flow; and local groundwater influence.

This PCE is presently functioning at unacceptable risk within the project action area, particularly in the later summer months when flows are insufficient to support bull trout use. Temperature data is unavailable for Grant Creek. The Clark Fork River in the vicinity of the project exhibits high summer temperatures that can exceed 17 °C in July and August (USGS 12353000 Clark Fork below Missoula MT). 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 stream temperatures relative to historic conditions. Temperatures in Grant Creek during spring when bull trout may be present in the action area likely do not prohibit bull trout use through this reach. The proposed project is expected to maintain this PCE.

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 does not support bull trout spawning. The proposed project is expected to maintain this PCE.

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 functioning at unacceptable risk in the action area. Channelization has altered the natural hydrograph in this stretch of Grant Creek. The proposed project is expected to maintain this PCE through the project reach.

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

Grant Creek is impaired in the vicinity of the project. Water quantity is impacted in Grant Creek due to its intermittent flows. Adverse effects to water quality in Grant Creek from

turbidity during construction is anticipated to be minor and negligible. The proposed project is expected to maintain this PCE through the project reach.

PCE 9: Sufficiently low levels of occurrence of nonnative 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 functioning at unacceptable risk (see Table 3-2) in the action area. Brook and rainbow trout, both introduced to the Clark Fork Basin, are present in the action area. The project is not anticipated to affect presence of nonnative species and it will not create habitat that unduly favors them over bull trout. The proposed project is expected to maintain this PCE.

Table 3-2. Effects Matrix Checklist for the Proposed Action

Diagnostic/Pathways: Indicators	Population and Environmental Baseline (FA, FAR, FUR)[a]	Major Effects[b] of the Action(s) (Restore, Maintain, Degrade)	Minor Effects[c] of the Action(s) (Restore, Maintain, Degrade)
SUBPOPULATION CHARACTERISTICS			
Subpopulation Size	FUR	Maintain	Maintain
Growth & Survival	FUR	Maintain	Maintain
Life History Diversity & Isolation	FAR	Maintain	Maintain
Persistence and Genetic Integrity	FUR	Maintain	Maintain
WATER QUALITY			
Temperature	FUR	Maintain	Maintain
Sediment	FUR	Maintain	Maintain
Chemical Contamination/Nutrients	FUR	Maintain	Maintain
HABITAT ACCESS			
Physical Barriers	FUR	Maintain	Maintain
HABITAT ELEMENTS			
Substrate Embeddedness	FUR	Maintain	Maintain
Large Woody Debris	FUR	Maintain	Maintain
Pool Frequency & Quality	FUR	Maintain	Maintain
Large Pools	FUR	Maintain	Maintain
Off-Channel Habitat	FUR	Maintain	Maintain
Refugia	FUR	Maintain	Maintain
CHANNEL CONDITION & DYNAMICS			
Wetted Width/Max Depth Ratio	FUR	Maintain	Maintain
Streambank Condition	FUR	Maintain	Maintain
Floodplain Connectivity	FUR	Maintain	Maintain
FLOW & HYDROLOGY			
Change in Peak/Base Flows	FUR	Maintain	Maintain
Drainage Network Increase	FAR	Maintain	Maintain
WATERSHED CONDITIONS			
Road Density & Location	FUR	Maintain	Maintain
Disturbance History	FUR	Maintain	Maintain
Riparian Conservation Area	FUR	Maintain	Maintain
Disturbance Regime	FAR	Maintain	Maintain
Integration of Species and Habitat Condition	FUR	Maintain	Maintain

[a] Source: USFS 2008; Functioning Acceptable – FA; Functioning at Risk – FAR; Functioning at Unacceptable Risk - FUR
[b] Major effects - change one level from baseline condition (e.g. FA to FAR).
[c] Minor effects - Indicates action may result in an incremental or cumulative effect, but does not result in a functional change to the system (no change in functional level).

Because the project as proposed will not directly impact Grant Creek and because of the BMPs and conservation measures that will be in place, the potential for effects from the project on bull trout critical habitat would be limited to minute amounts of particles, debris or sediments accidentally entering the river via irrigation ditch return flows. In the unlikely event that this occurred, increased turbidity and sedimentation downstream of the project would be so low that it would not be quantifiable. Effects to bull trout critical habitat are extremely unlikely to occur and are therefore insignificant and discountable.

Potential indirect effects of the proposed project on bull trout critical habitat have been evaluated. The study area is expected to experience substantial development in the years following construction of the proposed project. The addition of new development and increase in impervious surfaces has potential to increase the potential for storm water runoff effects to Grant Creek. It is assumed that storm water treatment will be provided within respective subdivisions and properties that are subsequently developed and that runoff from the new development will only be allowed to discharge into the Mullan BUILD network at a pre-developed flow rate. New development would be required to implement storm water BMPs consistent with the MS4 General Permit requirements.

An interrelated action is an action that is part of a larger action and depends on the larger action for its justification. An interdependent action is defined as an action having no independent utility apart from the proposed action. The proposed project will require a gravel borrow material site, staging areas for equipment, and gravel stockpiles. The locations of these features are currently unknown, but these interrelated actions may need to be reviewed by the construction contractor for their potential impact to bull trout critical habitat in the project area before construction. No interdependent projects have been identified in association with the proposed action.

3.6.4 Conservation Measures

See Section 1.3.5 for conservation measures applicable to bull trout.

3.6.5 Determination of Effect

Although occurrence of bull trout in the project action area is expected to be rare, a low possibility remains for individual bull trout to be present during construction activities.

The proposed action ***may affect*** bull trout temporarily, in the unlikely event that one or more individuals are present, by:

- An unanticipated event that allows a negligible amount of sediments to bypass BMPs and migrate via irrigation channels downstream and into Grant Creek.

However, the proposed action is ***not likely to adversely affect*** bull trout because:

- No in-stream work would occur in Grant Creek and there is no potential for direct harm or mortality of bull trout during construction activities. (Insignificant)
- Increased turbidity in Grant Creek as a result of culvert installation on the irrigation ditch lateral is anticipated to be minor and negligible. (Insignificant)
- The likelihood of bull trout within the action area during the beginning of the irrigation season when irrigation return flows into Grant Creek could occur is low. (Discountable)

The proposed action ***may affect*** bull trout critical habitat because:

- The potential for sediments to travel down gradient via irrigation ditches into Grant Creek cannot be fully discounted.

However, the proposed action is ***not likely to adversely affect*** bull trout critical habitat because:

- No direct disturbance to the bed or banks of Grant Creek or adjacent riparian vegetation would occur. (Discountable)
- BMPs will be implemented (as described in Section 1.3.5) to avoid and minimize impact on or degradation of water quality as a result of the project. (Insignificant)

In summary, a ***may affect, not likely to adversely affect*** determination is rendered relative to bull trout and a ***may affect, not likely to adversely affect*** determination is rendered relative bull trout critical habitat.

3.7 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 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. 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 resulting from past, present, and reasonably foreseeable actions within the cumulative analysis area.

The proposed project is the first phase of a future transportation network as proposed in the BUILD grant. Although funding and future implementation timelines are uncertain, eventually the study area will see the completion of the additional project elements as described in Section 1.2. This includes additional roads, trails, and restoration of Grant Creek. Future Grant Creek restoration would involve a federal nexus—U.S. Army Corps of Engineers authorization under Section 404 of the Clean Water Act—which would trigger an independent evaluation in accordance with Section 7 of the ESA.

The proposed project's residual impacts include potential short-term degradation of water quality in bull trout critical habitat. It is anticipated that as future development occurs and the agricultural lands disappear, the existing irrigation ditches laterals would be abandoned and would cease to provide a conveyance to Grant Creek. The private development anticipated in the Mullan area could influence water quality through increased impervious surfaces of rooftops and parking areas and increased runoff volumes, some of which may reach Grant Creek either directly or indirectly. The ability for private development to handle storm water management on-site in accordance with the MS4 General Permit requirements would substantially reduce the potential for cumulative impacts on water quality.

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Appendix A. Representative Site Photos (taken on May 26-27, 2020)

Photo 1. Agricultural field located along the proposed George Elmer Drive alignment, looking north.

Photo 2. Agricultural field located along the proposed England Boulevard alignment, looking east towards Flynn Lane.

Photo 3. Agricultural field located along the proposed northern extension of Mary Jane Boulevard alignment, looking west.

Photo 4. Agricultural field located at the proposed crossing of George Elmer Drive and the realigned Grant Creek, looking north.

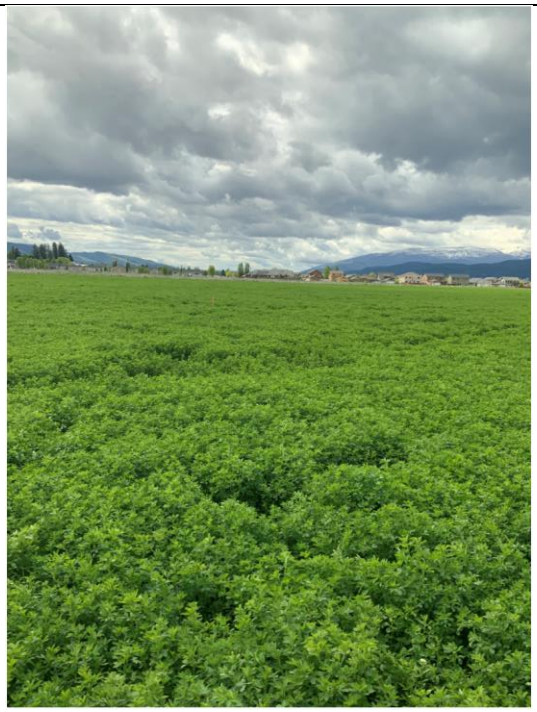

Photo 5. Agricultural field located along the proposed intersection of George Elmer Drive and England Boulevard, looking south.

Photo 6. Flynn-Lowney Ditch near the intersection of the existing George Elmer Drive, looking east.

Photo 7. Vacant field located between Roundup Drive and Lariat Loop.

Photo 8. Lateral 1 of Flynn-Lowney Ditch near Tipperary Way Road looking north.

Photo 9. Lateral 1 of Flynn-Lowney Ditch at the proposed England Boulevard crossing, looking south.

Photo 10. Lateral 1 of Flynn-Lowney Ditch at the proposed George Elmer Drive crossing, looking east.

Photo 11. Lateral 1 of Flynn-Lowney Ditch where it joins Grant Creek, looking west.

Photo 12. Lateral 1 of Flynn-Lowney Ditch near its confluence with Grant Creek, looking east.

Photo 13. Lateral 2 of Flynn-Lowney Ditch where it enters Grant Creek, looking south.

Photo 14. Lateral 2 of Flynn-Lowney Ditch, looking east.

Photo 15. Grant Creek at the approximate location of the future upstream channel realignment, looking west.

Photo 16. Grant Creek at the approximate location of the future downstream channel realignment, looking south.

	
Photo 17. Grant Creek along the ‘horseshoe bend’ segment, looking southwest.	