



Central Oregon Irrigation District
Pilot Butte Canal EIS
Draft Biological Resources Technical Report
Deschutes County, Oregon

Prepared for

Central Oregon Irrigation District



October 2025

Prepared by

Parametrix

Some documents included in this are provided as they were originally produced and may not fully comply with Section 508 of the Rehabilitation Act. These materials include third-party reports, historical documents, maps, and technical drawings that cannot be readily converted into accessible formats.

Upon request, the Natural Resources Conservation Service will provide reasonable accommodations or accessible alternatives for individuals with disabilities. To request assistance, please contact Gary Diridoni, gary.diridoni@usda.gov, (503) 414-3092 within a reasonable time frame.

Central Oregon Irrigation District Pilot Butte Canal EIS Draft Biological Resources Technical Report

Prepared for

Central Oregon Irrigation District
1055 SW Lake Road
Redmond, OR 97756

Prepared by

Parametrix
150 NW Pacific Park Lane, Suite 110
Bend, OR 97701
T. 541.508.7710 F. 1.855.542.6353
www.parametrix.com

CITATION

Parametrix. 2025. Central Oregon Irrigation District Pilot Butte Canal EIS Draft Biological Resources Technical Report. Prepared by Parametrix, Bend, Oregon. May 2024. Revised October 2025.

CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, as a certified Professional Wetland Scientist.

Prepared by Chloe Kott (Scientist)

Signature reserved for final version

Checked by Taya K. MacLean, MS, PWS (Senior Scientist)

Signature reserved for final version

Approved by Shane Phelps
(Consultant Project Manager)

Signature reserved for final version

CONTENTS

EXECUTIVE SUMMARY	ES-1
1. INTRODUCTION	1
1.1 Project Location	1
1.2 Project Purpose and Need	3
2. PROJECT ALTERNATIVES.....	3
2.1 No Action (Future without Federal Investment).....	3
2.2 Modernization Alternative (Future with Federal Investment)	3
2.2.1 Deschutes County/North Bend Alignment Options	6
2.2.2 City of Redmond Alignment Options	8
3. DEFINITIONS.....	10
4. LEGAL REGULATIONS AND STANDARDS	10
4.1 Laws, Plans, Policies, and Regulations	10
4.1.1 Federal.....	10
4.1.2 State of Oregon	12
4.1.3 Deschutes County	13
4.1.4 City of Bend	14
4.1.5 City of Redmond.....	14
4.2 Design Standards	14
5. AFFECTED ENVIRONMENT.....	14
5.1 Study Area	14
5.2 Resource Identification and Evaluation Methods.....	14
5.2.1 Published Sources and Databases.....	14
5.2.2 Field Visits and Surveys	15
5.3 Existing Conditions	16
5.3.1 Vegetation	16
5.3.2 Wildlife	19
5.3.3 Aquatic Species	23
5.3.4 Wetlands	31
6. IMPACT ASSESSMENT METHODOLOGY AND DATA SOURCES	34
6.1 Long-Term Impact Assessment Methods	34

CONTENTS (CONTINUED)

6.2 Short-Term (Construction) Impacts Assessment Methods.....	34
6.3 Indirect Impact Assessment Methods	35
6.4 Cumulative Impact Assessment Methods.....	35
7. ENVIRONMENTAL CONSEQUENCES.....	35
7.2.1 Modernization Alternative (Full Piping)	41
7.2.2 Potential Off-Site Staging Areas	46
7.2.3 Cumulative Effects	47
7.3 Compliance with Laws, Regulations, and Standards.....	50
7.3.1 Federal.....	50
7.3.2 State	51
7.3.3 Local	52
7.4 Conclusion	52
8. MITIGATION MEASURES	53
8.1 Construction.....	53
8.2 Operations and maintenance	54
9. CONTACTS AND COORDINATION	54
10. PREPARERS.....	55
11. REFERENCES	56
FIGURES	
Figure 1. Project Area	2
Figure 2. Project Groups	5
Figure 3. Deschutes County/North Bend Alignment Options	7
Figure 4. Redmond Alignment Options	9
TABLES	
Table 1. Project Group Construction Sequence	4
Table 2. Common Vegetation within the Study Area	16
Table 3. Noxious Weeds Potentially Occurring in the Study Area	18
Table 4. Wildlife Species Potentially Occurring within the Study Area	19

CONTENTS (CONTINUED)

Table 5. Migratory Birds of Particular Concern with a Potential Range (Continental U.S. and Alaska) in the Study Area.....	20
Table 6. Federally Listed Species with a Potential Range in the Project Area.....	21
Table 7. State Listed Species with a Potential Range in the Project Area	22
Table 8. Fish and Aquatic Species Found in the Study Area	24
Table 9. Primary Constituent Elements for Oregon Spotted Frog Critical Habitat.....	28
Table 10. Primary Constituent Elements for Bull Trout Critical Habitat.....	29
Table 11. Wetland Features Identified within the Study Area	33

APPENDICES

- A Figures
- B Background Information

ACRONYMS, INITIALISMS, AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
cfs	cubic feet per second
COID	Central Oregon Irrigation District
CWA	Clean Water Act
DSL	Oregon Department of State Lands
EIS	environmental impact statement
ESA	Endangered Species Act
GIS	geographic information system
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act of 1969
NOAA Fisheries	National Oceanic and Atmospheric Administration National Marine Fisheries Service
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
OAR	Oregon Administrative Rules
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish and Wildlife
ORS	Oregon Revised Statute
PCE	primary constituent element
PBC	Pilot Butte Canal
RM	river mile
SOC	species of concern
sq ft	square feet
sq mi	square miles
SSURGO	Soil Survey Geographic Database
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

EXECUTIVE SUMMARY

The construction and operation of irrigation infrastructure, including the modernization of existing irrigation canal and lateral systems, can have effects on aquatic species and wildlife populations, associated habitats, vegetative communities, and wetlands. This technical report identifies, describes, and evaluates the potential long-term, short-term (i.e., temporary, construction-phase), and indirect effects related to biological resources from the Pilot Butte Canal (PBC) Piping Project.

Long-term impacts to biological resources would range from negligible to beneficial. No impacts to jurisdictional wetlands would result, because none were identified within the Project Area. Long-term negligible impacts are primarily indirect and associated with the removal of the open canal as a seasonal water resource to surrounding vegetation, wildlife, aquatic species, and non-jurisdictional wetlands. Additional long-term minor adverse impacts to aquatic species may occur due to permanent conversion of non-jurisdictional wetland resources to upland habitat. Long-term beneficial impacts to vegetation and terrestrial wildlife would occur following piping of the canal due to noxious weed management and increased habitat connectivity.

Temporary impacts to biological resources would range from negligible to minor and adverse. Negligible effects would include physical and noise impacts to terrestrial wildlife and amphibians caused by general construction activities such as movement of vehicles and equipment. Additional negligible effects caused by general construction activities would include physical impacts to vegetation and non-jurisdictional wetlands. Minor adverse impacts to vegetation and non-jurisdictional wetlands would occur due to earthmoving-related ground disturbance during pipe construction. Although construction of the Modernization Alternative would take place outside of the irrigation season and therefore outside of the nesting season for migratory birds of concern, construction could overlap with the primary nesting season for eagles and raptors. This could result in minor to moderate adverse effects as shockwaves and vibrations from construction activities, specifically blasting, could cause physical damage to nearby nests as well as nest abandonment.

Mitigation measures would include clear on-site construction limits, careful access route selection, adherence to prescribed buffer distances for nesting migratory birds of concern, eagles, and raptors, and placement of silt fencing to minimize the mobilization of sediment into waterbodies via stormwater runoff. Additionally, implementation of ramps could prevent wildlife entrapment during construction, and post-construction recontouring and planting would restore habitat connectivity. Overall, the project aims to balance effects on biological resources from modernization of the PBC with ecological considerations.

1. INTRODUCTION

As a part of the preparation of the Environmental Impact Statement (EIS) for the Pilot Butte Canal (PBC) Piping Project (Project), this technical report has been prepared to identify and evaluate impacts from the project on vegetation, wildlife, aquatic species, and wetlands and waters within the Project's Study Area.

1.1 Project Location

The Central Oregon Irrigation District (COID or District) is analyzing piping approximately 18 to 21 miles of the PBC from NE 17th Street in Redmond, Oregon, to the diversion point from the Deschutes River in Bend, Oregon (Figure 1). The piping would extend from the piped section of the PBC approved under the 2020 Smith Rock-King Way Infrastructure Modernization Project Final Watershed Plan-Environmental Assessment. Additional portions along the existing alignment that have been piped or converted to box culverts during previous construction projects include:

- Major freeway or roadway crossings of US 97, Hwy 20, and Hwy 126, in Bend and Redmond (0.2 miles)
- Within the City of Bend and Deschutes County for the Juniper Ridge hydroelectric facility (3.3 miles)
- Within Deschutes County north of the Juniper Ridge hydroelectric plant (0.1 mile)
- Within urbanized Redmond (1.5 miles)

The portions that are proposed to be piped as part of this Project are shown in Figure 1.

Central Oregon Irrigation District
Pilot Butte Canal EIS
Draft Biological Resources Technical Report
Central Oregon Irrigation District

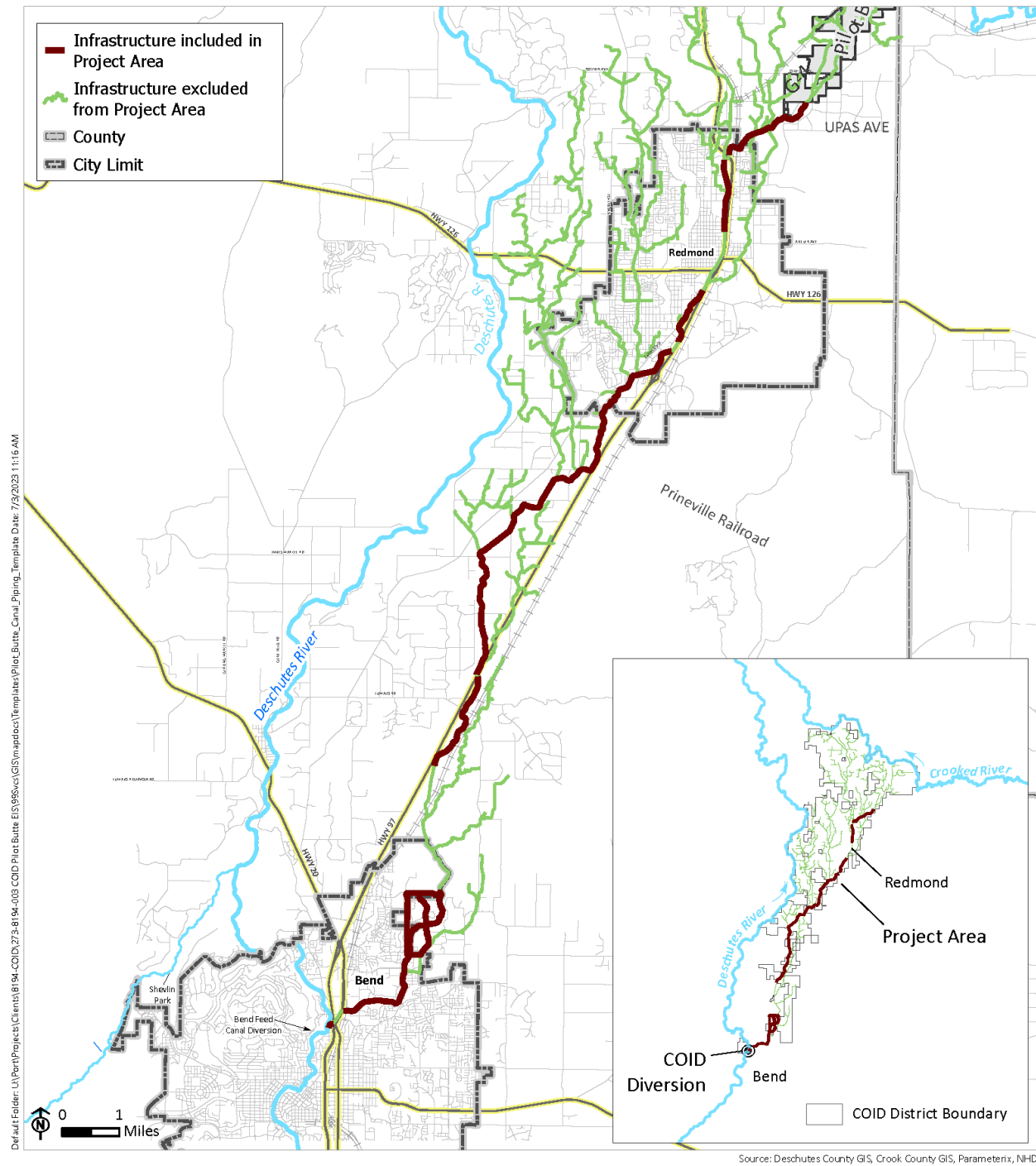


Figure 1. Project Area

1.2 Project Purpose and Need

The purpose of this Project is agricultural water management through irrigation water conservation (canal to pipe) in District-owned infrastructure, improvement of water delivery reliability to District patrons, and reduction of long-term operation and maintenance costs on approximately 21 miles of the District-owned PBC. The project is needed to address the following watershed problems and resource concerns: water loss in District conveyance systems and water delivery, operation, and maintenance inefficiencies. Implementation of the proposed action would address the District's objectives and goals to reduce seepage loss; provide better-managed water diversions for farm use; support agricultural land use; and increase public safety.

2. PROJECT ALTERNATIVES

2.1 No Action (Future without Federal Investment)

Under the No Action Alternative, the District would continue to operate and maintain the existing delivery system within the Project Area in its current condition. This alternative assumes that modernization of the District's infrastructure would not be reasonably certain to occur, as funding at the scale necessary to modernize District infrastructure is not anticipated from other sources. The No Action Alternative would be a continuation of the District's current operations and maintenance.

The No Action Alternative would not meet the project purpose and need. Water would continue to be lost to seepage and evaporation in District infrastructure. Inefficiencies in water delivery reliability for farmers; streamflow and habitat conditions for fish and aquatic species; public safety; and sediment levels in irrigation water would not improve. The No Action Alternative would fail to achieve the goal of maximizing sustainable economic development, as identified in the Federal Objective to protect the environment. It would not resolve current water supply problems stemming from the loss of water from District infrastructure. Further, it would not foster the economic well-being of present and future generations through sustainable use and management of water resources to provide water supply and water quality for irrigated agriculture in the Deschutes Basin.

2.2 Modernization Alternative (Future with Federal Investment)

The Modernization Alternative would focus on a single priority infrastructure modernization project: the District would replace the existing open PBC within the Project Area with a pressurized, closed conduit pipeline system (see Figure 2). When completed, the pipe would extend over approximately 18 to 21 miles of the COID system from the diversion point from the Deschutes River in Bend, Oregon, to NE 17th Street in Redmond, Oregon. Pipeline construction would begin in the northern portion of the Project Area at the piped section of the PBC that was approved under the 2020 Smith Rock-King Way Infrastructure Modernization Project Final Watershed Plan-Environmental Assessment (USDA, NRCS 2020), and progress south to the North Canal Dam. Construction of the Modernization Alternative would occur over the course of 3 years; two project groups would be constructed each construction season. The six project groups are described in Table 1.

Table 1. Project Group Construction Sequence

Project Groups	Project Group Length (feet)	Construction Year	Construction Start	Construction End
1 – King Way	11,000	0	October 2026	April 2027
2 – Redmond				
Pilot Butte Canal Alignment Option	13,500	1	October 2027	April 2028
Watermaster Road Alignment Option	13,500	1	October 2027	April 2028
NW Canal Boulevard Alignment Option	13,500	1	October 2027	April 2028
3 – Veterans Way	16,700	2	October 2028	April 2029
4 – Canal	13,900	2	October 2028	April 2029
5 – Deschutes Market	22,000	1	October 2027	April 2028
6 – Rivers Edge				
Pilot Butte Canal Alignment Option	18,100	0	October 2026	April 2027
18th Street Alignment Option	19,300	0	October 2026	April 2027
Old Deschutes Road Alignment Option	19,800	0	October 2026	April 2027

Construction would occur during the non-irrigation season (October to April), with Project Group 1 (King Way) and Project Group 6 (Rivers Edge) construction beginning as early as the 2026–2027 non-irrigation season. The construction sequencing may be changed to provide flexibility for the construction contractor. Construction of each project group is anticipated to require one non-irrigation season to complete, and all six project groups would be completed over the course of three construction seasons. Two project groups—Redmond and Rivers Edge—each contain a segment with multiple alignment options. The alignment options are discussed below. Under the Modernization Alternative, federal funding through Public Law 83-566 would be available and would be expected to cover approximately 75% of total costs. The District would cover the remaining 25% of total costs.

A section of the PBC in Deschutes County just south of the Juniper Ridge hydroelectric facility, in the Rivers Edge project group, and another section in the downtown area of Redmond, in the Redmond project group, include historic features listed in the National Register of Historic Places (NRHP). In 2019, a Section 106 programmatic agreement was signed by COID, the Oregon State Historic Preservation Office, and the Bureau of Reclamation. The Natural Resources Conservation Service (NRCS) was added as a signatory in 2023. The programmatic agreement identified that COID will maintain the downtown Redmond reach “such that the historic integrity of and identification of the historic property as representative of an irrigation conveyance system will not be adversely affected.” The alignment options for the Deschutes County/North Bend (in the Rivers Edge project group) and the City of Redmond (in the Redmond project group) NRHP-listed historic sections of the Project Area are described in Section 2.2.1 and Section 2.2.2, respectively.

For the Modernization Alternative and all alignment options, blasting will be required and could potentially occur at any point along the pipe alignment. Preliminary geotechnical investigations in the northern portion of the alignment (King Way Project Group) have been evaluated during design. In order to reach approximately 15 feet of depth below existing grade for the pipe trench, the bottom 2 to 10 feet of the pipe trench would require blasting. The variation is due to different geologic conditions as the alignment progresses from south to north in the King Way Project Group. Although detailed

geological investigations have not been completed along the entire alignment, it is anticipated that similar ground conditions would be encountered through the entirety of the alignment.

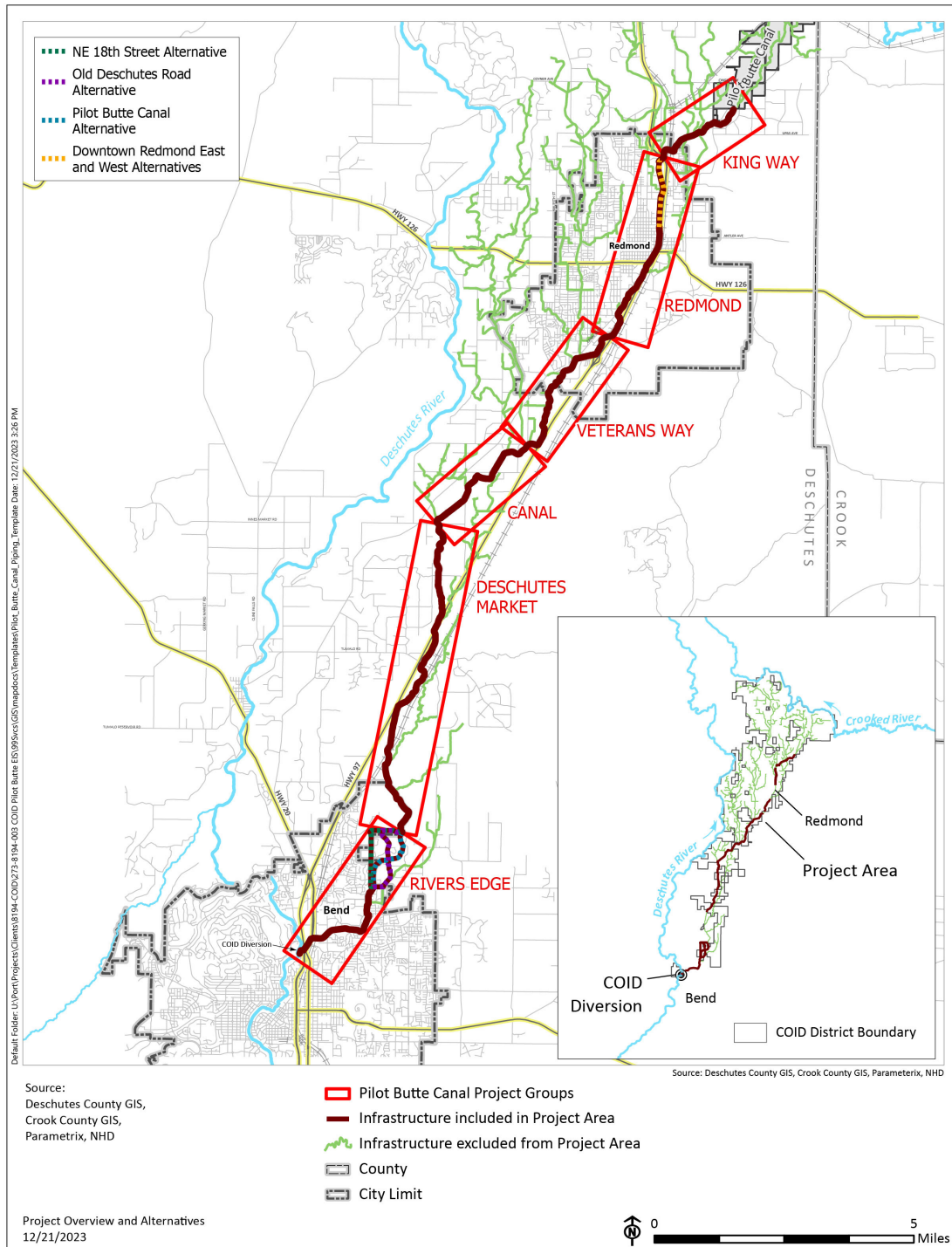


Figure 2. Project Groups

2.2.1 Deschutes County/North Bend Alignment Options

The Modernization Alternative has four options for piping between Yeoman Road and Cooley Road in Deschutes County and north Bend (see Figure 3).

- No Modernization within this Segment (no piping)
- Pilot Butte Canal Alignment (existing canal alignment)
- NE 18th Street Alignment
- Old Deschutes Road Alignment

2.2.1.1 No Modernization within this Segment (No Piping)

This alignment option would keep the 7,800-foot NRHP-listed stretch of the PBC between Yeoman and Cooley Roads in its current configuration and functionality as an open canal. This option would require a pressure reducing station south of Yeoman Road to slow the flow velocity as it exits the pressurized pipe so that the existing open canal can function as currently designed.

2.2.1.2 Pilot Butte Canal Alignment (Existing Canal Route)

This alignment option would replace the open channel with pipe directly within the existing open channel alignment. This alignment option would be built wholly within the section of canal that is listed in the NRHP. This option would not pipe the open channel section immediately south of the Juniper Ridge hydroelectric facility (approximately 170 feet), and it would require installing a pressure reducing station prior to where flow enters the hydroelectric facility.

2.2.1.3 NE 18th Street Alignment

This option would pipe the PBC within a new alignment beginning at the intersection of the existing alignment and Yeoman Road. It would travel west and then north to follow NE 18th Street to its intersection with Cooley Road. At Cooley Road, the alignment option would make an approximately 90-degree turn to follow an alignment extending from near the eastern terminus of Cooley Road to the existing PBC. This option would avoid impacts to a portion of the PBC that is listed in the NRHP. The historic section of canal would be left in place, but it would no longer receive irrigation water from the COID system.

2.2.1.4 Old Deschutes Road Alignment

The Old Deschutes Road Alignment option would place pipe in a new alignment beginning at Yeoman Road. It would travel east along Yeoman Road and then northeast to follow Old Deschutes Road. The alignment would travel generally north, cross the existing PBC, then continue north to Cooley Road. The alignment would make an approximately 90-degree turn to follow Cooley Road to the existing PBC. This option would avoid impacts to the NRHP-listed portion of PBC. The historic section of canal would be left in place, but it would no longer receive irrigation water from the COID system.

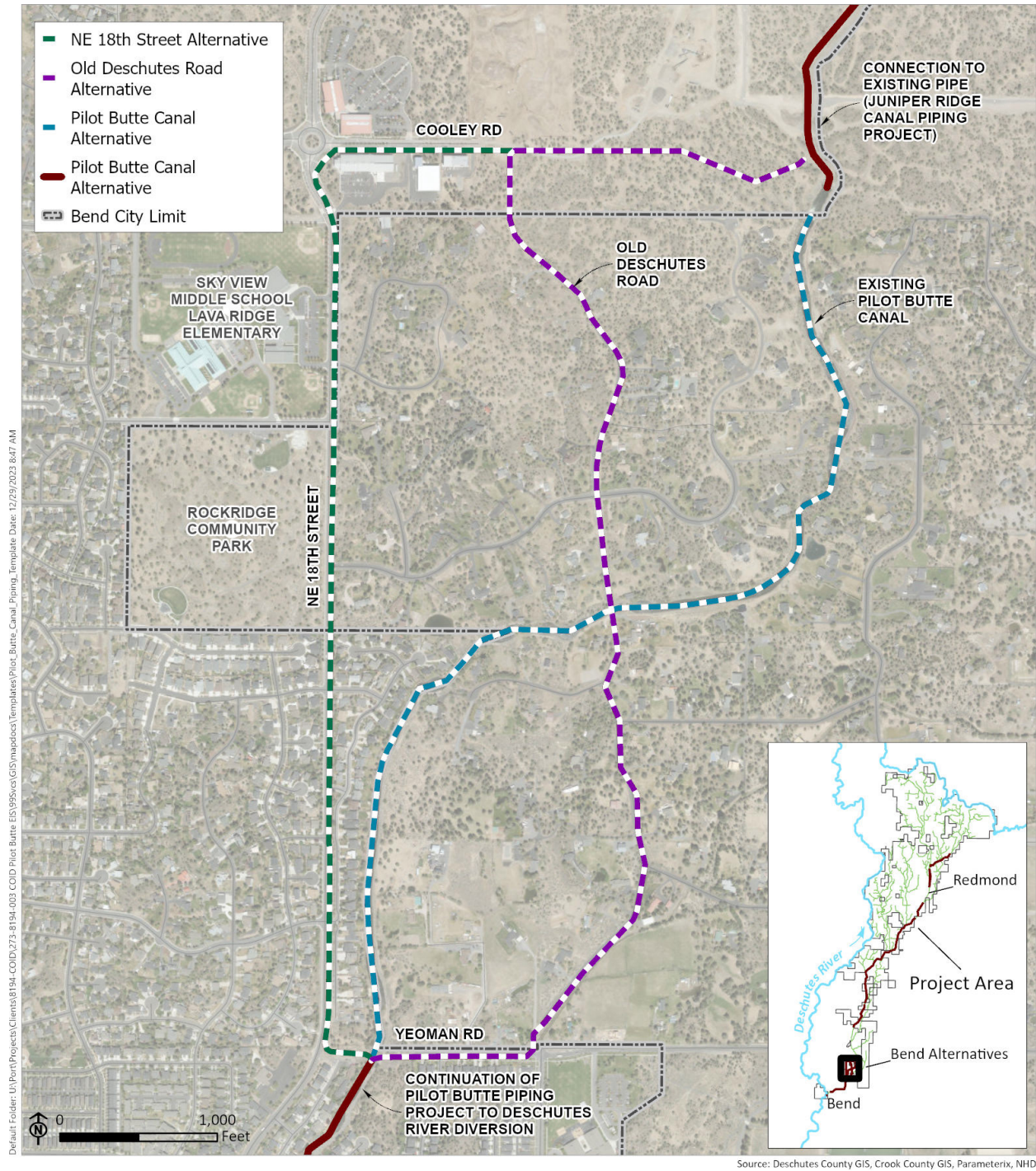


Figure 3. Deschutes County/North Bend Alignment Options

2.2.2 City of Redmond Alignment Options

The Modernization Alternative has four options for piping within the NRHP-listed historic Downtown Redmond section between NW Dogwood Avenue and NW Quince Avenue (see Figure 4).

- No Modernization within this Segment (no piping)
- Pilot Butte Canal Alignment (existing canal alignment)
- Piping to the east in the Watermaster's Access Road
- Piping to the west within Northwest Canal Boulevard

2.2.2.1 No Modernization within this Segment (No Piping)

This alignment option would keep the 6,800-foot NRHP-listed stretch of the PBC in Redmond in its current configuration and functionality as an open canal. This option would require installing a pressure reducing station near the intersection of SW Veteran's Way and US 97 to slow the flow velocity as it exits the pressurized pipe so that the existing open canal can function as currently designed.

2.2.2.2 Pilot Butte Canal Alignment (Existing Canal Route)

This alignment option would replace the open channel with pipe directly within the existing open channel alignment. This alignment option would be built wholly within the section of canal that is listed in the NRHP.

2.2.2.3 Piping to the east in the Watermaster's Access Road

This alignment option would install pipe to the east of the existing PBC and avoid impacts to the section of canal that is listed in the NRHP. The historic section of canal would be left in place, but it would no longer receive irrigation water from the COID system.

2.2.2.4 Piping to the west within Northwest Canal Boulevard

This alignment option would pipe to the west of the existing PBC, primarily within Northwest Canal Boulevard, and avoid impacts to the section of canal that is listed in the NRHP. The historic section of canal would be left in place, but it would no longer receive irrigation water from the COID system.

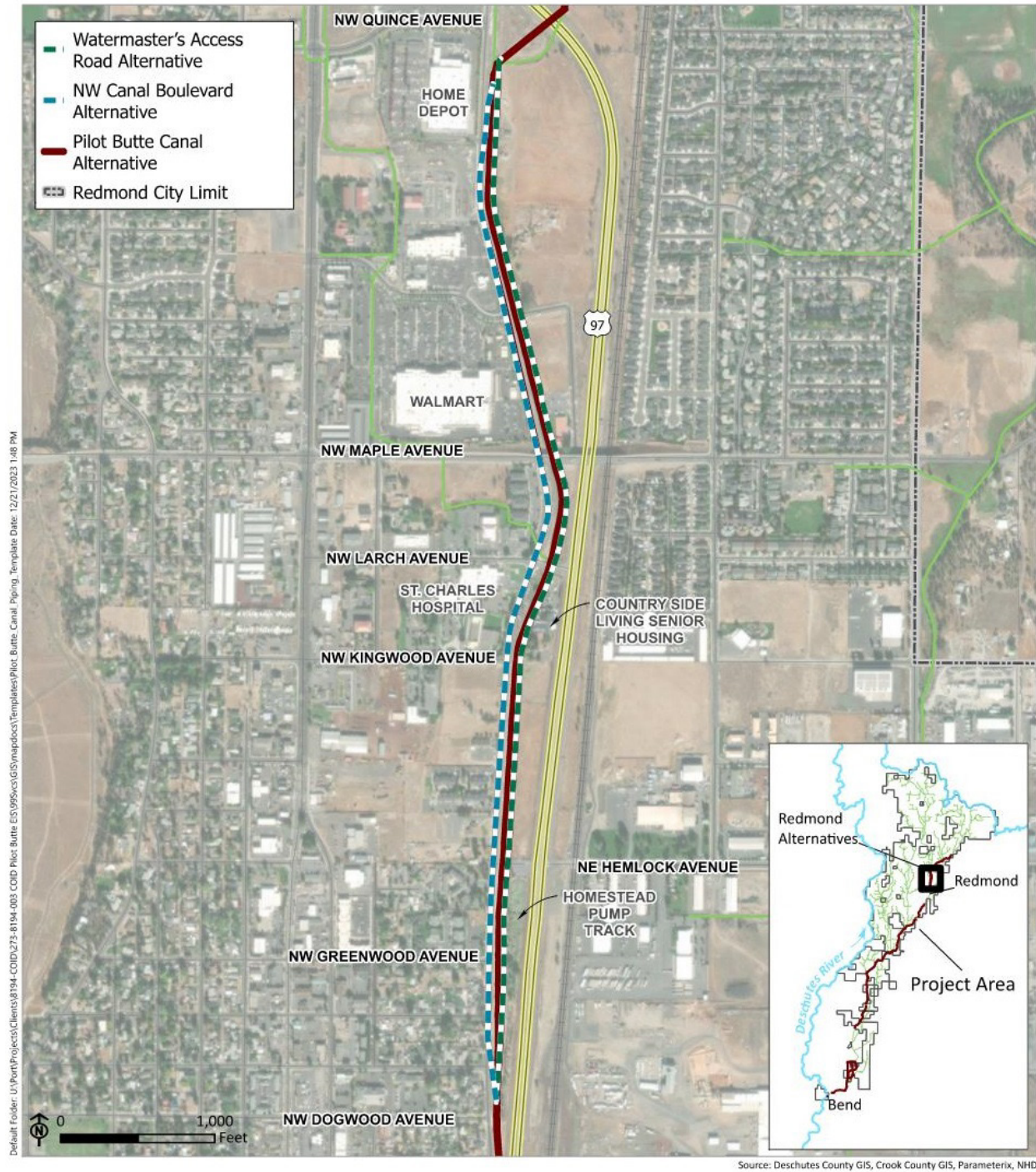


Figure 4. Redmond Alignment Options

3. DEFINITIONS

The following terminology is used when discussing geographic areas in this technical report.

Project Area. The area within which improvements associated with the project alignment options would occur and the area needed to construct these improvements. The Project Area includes the area needed to construct all permanent infrastructure, including adjacent parcels where modifications would be required for associated work such as utility realignments or upgrades.

Study Area. This is the general geographic area within which physical impacts to the environment could occur with the project alternatives. The Study Area is resource-specific and differs depending on the environmental topic being addressed. For all topics, the Study Area encompasses the Project Area, and for some topics (such as for utilities), the geographic extent of the Study Area is the same as that for the Project Area. For other topics (such as transportation) the Study Area is substantially larger to account for impacts that could occur outside of the Project Area. The Study Area for biological resources is defined in Section 5.1.

Project vicinity. The environs surrounding the Project Area. The project vicinity does not have a distinct geographic boundary but is used in general discussion to denote the larger area.

4. LEGAL REGULATIONS AND STANDARDS

4.1 Laws, Plans, Policies, and Regulations

Sensitive biological resources—including vegetation, wildlife, aquatic species, wetlands and waters, and associated habitats in the Study Area—are regulated by a number of state, local, and regional laws, plans, policies, and regulations.

4.1.1 Federal

4.1.1.1 Endangered Species Act of 1973

The Endangered Species Act (ESA) provides a framework to conserve and protect endangered and threatened species and their habitats from a project's effects such as modernization of irrigation infrastructure. Section 7 of the ESA requires federal agencies to ensure that actions they authorize, fund, or carry out do not jeopardize the existence of any species listed under the ESA, or destroy or adversely modify designated critical habitat of any listed species. The ESA is administered by the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries).

4.1.1.2 Deschutes Basin Habitat Conservation Plan

The *Deschutes Basin Habitat Conservation Plan* (DBHCP) was approved by USFWS and NOAA Fisheries (National Marine Fisheries Service, or NMFS) on December 31, 2020. Conservation measures in the DBHCP are designed to minimize and mitigate impacts caused by the incidental take of listed species that may result from the storage, release, diversion, and return of irrigation water by the irrigation districts in the Upper Deschutes Basin and the City of Prineville for a period of 30 years. The

conservation measures in the DBHCP adjust the allowed timing, volume, and duration of irrigation releases to better align with the life history needs of Oregon spotted frog (*Rana pretiosa*), bull trout (*Salvelinus confluentus*), and steelhead (*Oncorhynchus mykiss*) while continuing to deliver water for irrigation. The DBHCP conservation measures require management of Crane Prairie and Wickiup Reservoirs for specific minimum and maximum water surface levels, as well as incrementally increased releases from Wickiup Reservoir during the non-irrigation season to enhance Oregon spotted frog habitat. The DBHCP increases minimum winter flows downstream from Wickiup Reservoir to 100 cubic feet per second (cfs) for the first 7 years (2021–2027), then increases to 300 cfs for years 8 through 12 (2028–2032), and finally increases to 400 cfs at year 13, in 2033. See the Water Resources Technical Report for detailed discussion of the DBHCP.

4.1.1.3 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) established requirements for including Essential Fish Habitat (EFH) descriptions in federal fishery management plans, and it requires federal agencies to consult with NMFS on activities that may adversely affect EFH (Public Law 104-297). EFH can include all streams, lakes, ponds, wetlands, and other viable waterbodies and most of the habitat historically accessible to salmon necessary for spawning, breeding, feeding, or growth to maturity.

4.1.1.4 Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act (MBTA) is administered by USFWS and protects migratory birds, making it illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid federal permit.

4.1.1.5 Bald and Golden Eagle Protection Act of 1940

The BGEPA is administered by USFWS and protects two species of eagle through the prohibition of “take,” including parts (including feathers), nests, or eggs of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*).

4.1.1.6 Fish and Wildlife Coordination Act of 1934

The Fish and Wildlife Coordination Act protects fish and wildlife when federal actions result in the control or modification of a natural stream or body of water. The Fish and Wildlife Coordination Act protects fish and wildlife by requiring consultation when a federal agency modifies a body of water. It also provides the opportunity to evaluate impacts from development on fish and wildlife.

4.1.1.7 Environmental Impact Statement

Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA): 40 CFR Part 1502 requires the preparation of an EIS.

4.1.1.8 U.S. Department of Interior Executive Order 13751

The U.S. Department of Interior Executive Order 13751 safeguards the nation from impacts of invasive species. This order does so by both preventing their introduction and facilitating their control, aiming to

reduce the economic, ecological, and human health consequences associated with these invasive species.

4.1.1.9 Clean Water Act, 1977 as Amended, 33 USC 1251-1376

The Clean Water Act (CWA) requires states to set water quality standards for all contaminants in surface waters based on the “beneficial” or “designated” uses for the waterbody and makes it unlawful for a person to discharge a pollutant from a point source into navigable waters unless a permit was obtained under its provisions. It also recognizes the need to address the problems posed by nonpoint source pollution. The permitting processes within the purview of the CWA are summarized below.

Section 401 Water Quality Certification

Section 401 requires an applicant for a federal license, or a Section 404 permit applicant planning to conduct an activity that may result in a discharge to waters of the state or U.S., to obtain a certification that the activity complies with state water quality requirements and standards. Applicants must submit a pre-filing meeting request to the certifying state agency at least 1 month prior to submitting the Section 404 application to the U.S. Army Corps of Engineers. After the Section 404 application is submitted, the application is then forwarded to the certifying state agency by the U.S. Army Corps of Engineers. The state agency then certifies whether the project meets state water quality standards and does not endanger waters of the state or U.S. or wetlands and forwards the application to the EPA for review. Comments on the Section 404 application would be addressed by the applicant. Upon completion of the EPA review, the Section 401 certification is issued by the Oregon Department of Environmental Quality.

Section 404 for Permitting Discharges or Dredge or Fill Material

Section 404 requires a permit authorization from the U.S. Army Corps of Engineers for activities involving the discharge of dredge or fill material into waters of the U.S., including wetlands. This permit would be required for work associated with the project that would occur within a jurisdictional wetland or below the ordinary high-water mark of waterbodies within the Study Area.

4.1.2 State of Oregon

4.1.2.1 Oregon Administrative Rule (OAR) Division 412: Fish Passage

Oregon Administrative Rule (OAR) Division 412: Fish Passage prohibits the construction of an artificial obstruction across any waters in the state and outlines fish passage requirements.

4.1.2.2 Oregon Sensitive Species Rule

The Oregon Sensitive Species Rule (OAR 635-100-0040) focuses fish and wildlife conservation, management, and research on species that need conservation attention.

4.1.2.3 Oregon’s Statewide Planning Goals and Guidelines

OAR 660-015 establishes 19 statewide planning goals that express the state’s policies on land use planning, which are enacted on a local level by comprehensive planning and zoning ordinances. The

following goal is especially relevant to the PBC piping project and the biological resources impacts analysis:

- Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces. Goal 5 protects natural resources and conserves scenic and historic areas and open spaces.

4.1.2.4 Oregon Removal-Fill Law

ORS 196.795-990, Oregon's Removal-Fill Law, requires individuals or entities that plan to remove or fill material in wetlands or waterways of the state to obtain a removal-fill permit from the Department of State Lands (DSL). The Removal-Fill Law applies to all landowners, whether private individuals or public agencies. The purpose of the law is to ensure protection and the best use of Oregon's water resources for home, commercial, wildlife habitat, public navigation, fishing, and recreational uses. A permit is required if an activity will involve filling or removing 50 cubic yards or more of material in a wetland or waterway of the state. For activities in state-designated Essential Salmonid Habitat, State Scenic Waterways, and compensatory mitigation sites, a permit is required for any amount of removal or fill.

4.1.3 Deschutes County

4.1.3.1 Comprehensive Plan

The *Deschutes County Comprehensive Plan*, adopted in 2011, contains issues, goals, and policies to guide the County's land use planning decisions and public investments over a 20-year planning horizon, including goals and policies for wildlife, aquatic species, and vegetation.

4.1.3.2 County Code

Deschutes County Code protects the health, safety, and welfare citizens; and contribute to vital neighborhoods.

- Chapter 18.88, Wildlife Areas Combining Zone, conserves important wildlife areas in Deschutes County; protects an important environmental, social, and economic element of the area; and permits development compatible with the protection of wildlife resource.
- Chapter 18.89, Greater Sage-Grouse Area Combining Zone, protects the greater sage-grouse habitat and breeding population.
- Chapter 18.90, Sensitive Bird and Mammal Habitat Combining Zone, ensures that sensitive habitat areas identified in the County's Goal 5 sensitive bird and mammal inventory as critical for the survival of the northern bald eagle, great blue heron, golden eagle, prairie falcon, osprey, great grey owl, and Townsend's big-eared bat are protected from the effects of conflicting uses or activities which are not subject to the Forest Practices Act, which sets standards for all commercial activities involving the establishment, management, or harvesting of trees on Oregon's forestlands (ODF n.d.).

4.1.4 City of Bend

4.1.4.1 Comprehensive Plan

The *Bend Comprehensive Plan*, most recently updated in 2023, is a long-range planning guide for making land use decisions regarding future development and growth within Bend's urban growth boundary. Chapter 2 of the comprehensive plan includes goals and polices for natural features and open space.

4.1.5 City of Redmond

4.1.5.1 Comprehensive Plan

Adopted in 2020, the *Redmond Comprehensive Plan* is a guide to future growth, development, and redevelopment of the Redmond urban area. The comprehensive plan includes goals and policies for natural resources, scenic and historic areas, and open spaces.

4.2 Design Standards

The Project Area is located in a wide range of zoning designations throughout its existing alignment and the proposed alignment options in Bend, Redmond, and unincorporated Deschutes County. Zoning districts—and their respective development standards as enumerated in the Bend, Redmond, and Deschutes County development codes—are discussed in further detail in the Land Use Technical Report. Further guidance regarding development in or alongside COID canal alignments is available in the *COID Development Handbook* (COID 2008). All relevant design standards will be reviewed in detail during the permitting process for the piping project.

5. AFFECTED ENVIRONMENT

5.1 Study Area

The Study Area for biological resources includes all land adjacent to or intersected by the existing PBC alignment and all alignment options, including a 200-foot buffer on either side of the canal alignment to account for potential construction impacts. Additionally, the Study Area includes waters associated with District operations: Crane Prairie Reservoir, Wickiup Reservoir, and the Deschutes River.

5.2 Resource Identification and Evaluation Methods

5.2.1 Published Sources and Databases

Sources used to conduct this vegetation, wildlife, and aquatic species analysis include the following:

- Bend Comprehensive Plan
- City of Bend GIS
- City of Redmond 2040 Comprehensive Plan

- City of Redmond GIS
- Department of State Lands
- Deschutes County Comprehensive Plan
- Deschutes County GIS
- Deschutes County Municipal Code
- Google Earth Aerial Imagery
- National Oceanic and Atmospheric Administration (NOAA) Essential Habitat Mapper
- USFWS National Wetlands Inventory (NWI) Wetlands Mapper
- NOAA Protected Resources App
- Oregon Biodiversity Information Center (ORBIC)
- Oregon Department of Agriculture (ODA) Noxious Weeds
- ODA Oregon Listed Plants by County
- ODA Oregon Listed and Candidate Plants Database
- ODA WeedMapper
- Oregon Department of Fish and Wildlife (ODFW) Fish Habitat Distribution and Barriers Webmap
- ODFW Threatened, Endangered, and Candidate Fish and Wildlife Species List
- Oregon Department of State Lands (DSL) 2023 Essential Salmonid Habitat Map
- Oregon Watershed Plans Environmental Assessments (EAs)
- StreamNet Mapper
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Web Soil Survey
- U.S. Fish and Wildlife Service (USFWS) Critical Habitat Mapper
- USFWS Environmental Conservation Online System (ECOS)
- USFWS Information, Planning, and Consultation (IPaC) System

5.2.2 Field Visits and Surveys

A reconnaissance-level site visit of the Project Area was conducted to collect general observations of wetlands, waters, and biological resources. On October 14 and 15, 2021, Parametrix scientist Irina Lapina, Professional Wetland Scientist, walked the length of the PBC and recorded visual observations. Herbaceous wetlands were observed along the canal, exhibiting varying degrees of continuity, often exceeding 6 feet in width. No potentially jurisdictional waters were observed. Wetland plant species (spp.) including sedges (*Carex* spp.), rushes (*Juncus* spp.), cattail (*Typha* spp.), bulrush (*Scirpus* spp.), iris (*Iris* spp.), and horsetail (*Equisetum* spp.) were prevalent. Wetland plant species observed less frequently included willow (*Salix* spp.) and saltgrass (*Distichlis spicata*). Aquatic bed vegetation was

noted in areas where water was retained in canal bottoms after the water supply was shut off. Wildlife sightings during the survey included a red fox, a mink (or related species), and deer, along with numerous songbirds, ducks, and plovers observed in areas where the presence of water was evident. No fish or aquatic species were observed.

5.3 Existing Conditions

Baseline conditions of the vegetation, wildlife, aquatic species, wetlands and waters, and habitats determined to be present or having the potential to occur within the Study Area are described below.

5.3.1 Vegetation

Vegetation provides ecological functions to a variety of environments. It provides habitat and food sources for wildlife, improves air quality, provides in-stream shade, filters stormwater, and contributes to flood control. It also provides societal benefits by connecting people with nature and reducing stress (Oregon Watershed Plans 2020). Even though substantial portions of the Study Area are highly developed, the existing vegetation provides important ecological functions to the immediate surroundings, supporting biological resources.

5.3.1.1 Common Vegetation

The common natural upland vegetation found within the Study Area includes western juniper, big sagebrush and low sagebrush, rabbit brush, wild rye and bunch grasses, and other plant species such as forbs commonly found in the dry Central Oregon steppe environment (Oregon Watershed Plans 2020). Agricultural crop grasses and forbs have also established along sections of the PBC that are adjacent to agricultural activities. Table 2 below provides a list of common vegetation species in the area (Oregon Watershed Plans 2020; ODA n.d.).

Table 2. Common Vegetation within the Study Area

Vegetation Species	Scientific Name
Big sagebrush	<i>Artemisia tridentata</i>
Bitterbrush	<i>Pseudoroegneria spicata</i>
Black cottonwood	<i>Populus balsamifera</i>
Bulrush	<i>Scirpus</i> spp.
Canada thistle	<i>Cirsium arvense</i>
Dalmatian toadflax	<i>Linaria dalmatica</i>
Idaho fescue	<i>Festuca idahoensis</i>
Low sagebrush	<i>Artemisia arbuscula</i>
Ponderosa pine	<i>Pinus ponderosa</i>
Rabbit brush	<i>Ericameria nauseosa</i>
Sandberg bluegrass	<i>Poa sandbergii</i>
Spotted knapweed	<i>Centaurea stoebe</i>
Western juniper	<i>Juniperus occidentalis</i>

The District mows annually along the main canal and main laterals where canal roads and conditions allow for wheeled tractor access. In operational areas where vegetation management is necessary, weed trimming, tree removal, and delimbing are performed. On a 2- to 3-year basis, canals are cleared of encroaching vegetation (grasses, reeds, shrubs).

A fringe of hydrophytic plants occurs sporadically along the margins of the top of the canal bank in some areas and is represented predominantly by species such as sedges, rushes, reed canarygrass, irises, bulrush, and willow. Where present, this vegetation is 6 feet wide or wider in scattered locations. However, this vegetation community provides low ecological functions due in part to the high level of disturbance resulting from infrastructure maintenance activities. During the warmer months of July and August, submerged aquatic plants (species of pond weed and algae) thrive in the slower-flowing segments of the canal system and are mechanically removed by COID (Oregon Watershed Plans 2020).

5.3.1.2 Special Status Species

No ESA endangered, threatened, or candidate plant species or their designated critical habitats, or Oregon special status plant species are known to occur within the Project Area or Study Area.

The majority of the Project Area lies within Deschutes County, where two special status species potentially occur: Oregon threatened pumice grape-fern (*Botrychium pumicola*) and Oregon threatened Peck's milkvetch (*Astragalus peckii*; ODA 2023). Pumice grape-fern occurs in alpine and montane habitats on rocky rims and ridges with relatively flat to gently sloping topography at elevations ranging from 4,240 to 9,065 feet (ODA 2018). Based on the USFWS IPaC database (USFWS n.d.c), ORBIC observation data (ORBIC 2023), District observations, ODA identification of species population centers, and the elevation and plant communities this species generally inhabits, pumice grape-fern is absent within the Project Area. Therefore, this special status plant species is not discussed further.

Peck's milkvetch occurs in sagebrush-juniper woodlands, ponderosa pine forests, and lodgepole pine forests, preferring sandy soils with minimal organic matter and pumice, generally at 3,000 to 5,000 feet in elevation. In Oregon, Peck's milkvetch is broadly grouped by ODA into three population centers: barren pumice flats near Chemult (62 miles south of the Project Area), east of Chiloquin in open ponderosa pine stands (92 miles south of the Project Area), and along US 97 between Sisters and Bend (within the Project Area) (ODA 2018). The Bureau of Land Management has designated a 14,114-acre Area of Critical Environmental Concern (ACEC) for the preservation of this species within the Blue Mountains ecoregion (2.5 miles west of the Project Area; Forest Science Labs 2023). However, the District has not documented any Peck's milkvetch within the Study Area. Additionally, the Study Area is located throughout highly developed and disturbed areas where existing potential habitat is fragmented. Based on the USFWS IPaC database, ORBIC observation data, District observations, ODA identification of species population centers, and the landscapes this species generally inhabits, Peck's milkvetch is absent within the Project Area. Therefore, this special status plant species is not discussed further.

According to ORBIC data, federal species of concern (SOC) Howell's thelypody (*Thelypodium howellii* ssp. *howellii*) was most recently observed in Bend in 1894 and is considered possibly extirpated. This SOC habitat consists of desert shrub communities and alkaline meadows and flats at 3,280 to 5,249 feet in elevation. Specific habitats include open wet to dry meadows, pastures, moist alkaline soils, near tule swamps, sandy banks, river valleys, and at the margins of ponds and lakes (Oregon Flora 2019).

According to USDA NRCS, the Study Area is not comprised of moist alkaline soils, rather it is comprised of non-hydric soils with low availability to water supply (NRCS, USDA n.d.). Additionally, the landscape

within the Study Area is highly fragmented by commercial and residential development. According to USFWS ECOS (USFWS n.d.b), this species is not known or believed to occur in Deschutes County. Therefore, this SOC plant species is not discussed further.

5.3.1.3 Common and Noxious Weeds

The Deschutes Basin Board of County Commissioners determines a weed to be noxious if it is “injurious to public health, agriculture, recreation, wildlife, or any public or private property,” and “impacts and displaces desirable vegetation.” Furthermore, it is recognized that certain noxious weeds are so pervasive that they have been classified by ORS 569.350 to be a menace to public welfare (ODA 2022). A variety of noxious weeds, including spotted knapweed (*Centaurea stoebe*), dalmatian toadflax (*Linaria dalmatica*), and Canada thistle (*Cirsium arvense*), are found within the Study Area (ODA n.d.). Table 3 lists the noxious and common weeds found in the Study Area.

Table 3. Noxious Weeds Potentially Occurring in the Study Area

Vegetation Species	Scientific Name	Deschutes County Noxious Weed Rating
Bull thistle	<i>Cirsium vulgare</i>	C
Cheatgrass	<i>Bromus tectorum</i>	C
Common mullein	<i>Verbascum thapsus</i>	C
Diffuse knapweed	<i>Centaurea diffusa</i>	B
Kochia	<i>Bassia scoparia</i>	C
Poison hemlock	<i>Conium maculatum</i>	B
Russian thistle	<i>Salsola</i> spp.	C
Spotted knapweed	<i>Centaurea stoebe</i>	B
Yellow flag iris	<i>Iris pseudacorus</i>	B
Yellow floating heart	<i>Nymphoides peltata</i>	A
Water hemlock	<i>Cicuta douglasii</i>	C

Source: Deschutes County 2022.

In the spring and fall of each year, COID applies herbicide along the PBC where ditch roads are accessible and spot-sprays noxious weeds on the opposite side of the canal.

The District routinely contracts with Deschutes County Vegetation Management (and occasionally other qualified contractors) for weed treatment. Aquatic weeds, such as yellow floating heart, cannot be treated with herbicide in the PBC and laterals during the irrigation season because the water is used for crop irrigation (Oregon Watershed Plans 2020). For this reason, the open PBC presents opportunities for the spread of noxious weeds.

5.3.2 Wildlife

5.3.2.1 General Wildlife

There are five general habitat types within the Study Area: riparian, aquatic, rural, urban/developed, and agricultural. Generally, wildlife present within the Study Area consists of habitat generalists or edge species with the ability to adapt to or exploit the agricultural environment. These species are tolerant to disturbance and include deer, coyote, skunk, gray squirrel, raccoon, and red-tailed hawk (Oregon Watershed Plans 2020).

Wildlife within the Study Area may use the canal as a water source and dispersal corridor. Additionally, where not cleared, vegetation along the PBC can provide food, cover, and breeding sites for many wildlife species throughout the year. In portions of the Study Area located within a more highly urbanized setting, such as in Bend and downtown Redmond, habitat connectivity has been modified by the construction of streets, buildings, and other transportation facilities. Development reduces vegetation and food sources, thereby decreasing wildlife occurrence. Potential habitat used by urban-adapted species in the developed areas may include bioswales, street trees, green roofs, and yards. Table 4 lists wildlife species that are likely to occur in the Study Area.

Table 4. Wildlife Species Potentially Occurring within the Study Area

Wildlife Species Common Name	Scientific Name
Bat	<i>Vespertilionidae</i> spp.
Coyote	<i>Canis latrans</i>
Desert horned lizard	<i>Phrynosoma platyrhinos</i>
Golden-mantled ground squirrel	<i>Spermophilus lateralis</i>
Mule deer	<i>Odocoileus hemionus</i>
Northern flicker	<i>Colaptes auratus</i>
Osprey	<i>Pandion haliaetus</i>
Pygmy rabbit	<i>Brachylagus idahoensis</i>
Pygmy short-horned lizard	<i>Phrynosoma douglasii</i>
Raccoon	<i>Procyon lotor</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Rufous hummingbird	<i>Selasphorus rufus</i>
Turkey vulture	<i>Cathartes aura</i>
Western gray squirrel	<i>Sciurus griseus</i>
Western rattlesnake	<i>Crotalus viridis</i>
Western skink	<i>Eumeces skiltonianus</i>
Yellow pine chipmunk	<i>Neotamias amoenus</i>

Source: Oregon Watershed Plans 2020

Notes: This is a partial list of wildlife species that potentially occur within the Project Area.

5.3.2.2 MBTA/BGEPA Species

Multiple migratory birds protected under MBTA or BGEPA may be present in the Study Area. Although migratory birds are known to travel through the Project Area and its vicinity, limited habitat is provided within the Project Area and the COID right-of-way due to maintenance activities that remove vegetation on an annual basis. The birds listed in Table 5 are of particular concern because they are either designated as USFWS Birds of Conservation Concern or are protected by the BGEPA.

Deschutes County maintains a database of known golden and bald eagle nesting sites. The area along the Deschutes River, between SW Coyote Avenue and SW McVey Avenue, contains the only known eagle nesting site within approximately 1 mile of the proposed project (Deschutes County Community Development n.d.). No other bald or golden eagle territories are known to be within a half-mile of the proposed project, although it is also possible that a nest could be located near irrigation ponds and/or a proposed pipeline during construction of the project.

Table 5. Migratory Birds of Particular Concern with a Potential Range (Continental U.S. and Alaska) in the Study Area

Common Name	Scientific Name	Birds of Conservation Concern	Bald and Golden Eagle Protection Act	Breeding Period
American white pelican	<i>Pelecanus erythrorhynchos</i>	Yes – Bird Conservation Region	No	April 1–August 31
Bald eagle	<i>Haliaeetus leucocephalus</i>	No	Yes	January 1–September 30
California gull	<i>Larus californicus</i>	Yes – Rangewide	No	March 1–July 31
Cassin's finch	<i>Carpodacus cassinii</i>	Yes – Rangewide	No	May 15–July 15
Evening grosbeak	<i>Coccothraustes vespertinus</i>	Yes – Rangewide	No	May 15–August 10
Golden eagle	<i>Aquila chrysaetos</i>	No	Yes	January 1–August 31
Lewis's woodpecker	<i>Melanerpes lewis</i>	Yes – Rangewide	No	April 20–September 30
Long-eared owl	<i>Asio otus</i>	Yes – Rangewide	No	March 1–July 15
Olive-sided flycatcher	<i>Contopus cooperi</i>	Yes – Rangewide	No	May 20–August 31
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>	Yes – Rangewide	No	February 15–July 15
Rufous hummingbird	<i>Selasphorus rufus</i>	Yes – Rangewide	No	April 15–July 15
Sage thrasher	<i>Oreoscoptes montanus</i>	Yes – Bird Conservation Regions	No	April 15–August 10

Common Name	Scientific Name	Birds of Conservation Concern	Bald and Golden Eagle Protection Act	Breeding Period
Western grebe	<i>Aechmophorus occidentalis</i>	Yes – Rangewide	No	June 1–August 31

Source: Adapted from USFWS. n.d.c. and USFWS 2021a.

5.3.2.3 Federally Listed Species

A review of available USFWS data showed federal threatened and endangered terrestrial wildlife species and federal species of concern with potential to occur within the Project Area. Federally listed aquatic species are discussed in Section 5.3.3.2.

According to ORBIC data, there are no records of ESA-listed threatened or endangered wildlife species present in the Project Area. According to IPaC data, there is one federal endangered mammal species, one federal threatened bird species, and one federal candidate invertebrate species with potential ranges that include the Project Area; however, their respective critical habitats are outside of the Project Area (Table 6). The potential ranges are broad geographic ranges, such as “Oregon” or “found wherever,” although there may not be suitable habitat in the entire range. For example, gray wolf habitat does not include urban environments; therefore, it is not expected to be present within portions of the Project Area. Although the Project Area may not include suitable habitat for the terrestrial species listed in Table 6, they were taken into consideration as part of the potentially affected environment in this report.

Table 6. Federally Listed Species with a Potential Range in the Project Area

Description	Common Name (Scientific Name)	Federal Listing	Occurrence Potential ^a
Mammal	Gray wolf (<i>Canis lupus</i>)	Endangered	Not Likely to Occur
Bird	Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Threatened	Absent
Invertebrate animal	Monarch butterfly (<i>Danaus plexippus</i>)	Candidate	Absent

Source: Adapted from Deschutes County 2023, USFWS n.d.b, USFWS n.d.c, USFWS n.d.e, and National Park Service 2020.

a Not Likely to Occur = Habitat is only marginally suitable or is suitable but not within species geographic range.

May Occur = Species is expected to occur and habitat meets special requirements.

Absent = Habitat does not meet species requirements as currently understood in the scientific community.

Gray wolf (*Canis lupus*) is listed as a federal endangered species. The nearest known population occurs approximately 30 miles south of the Project Area (USFWS n.d.c, USFWS n.d.d). Given the current population growth and dispersal capabilities of wolves, it is possible for a wolf to show up in almost any part of the state. However, since the Project Area is surrounded by urban development and agricultural land use, this species is not likely to occur within the Project Area.

Yellow-billed cuckoo (*Coccyzus americanus*) is listed as a threatened federal species. This species is known to occupy wooded habitat with dense cover and water nearby, including woodlands with low, scrubby vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes (USFWS n.d.b, USFWS n.d.c, USFWS n.d.e). The Project Area landscape is not dominated by wooded habitat with dense cover and does not include a perennial water source. Therefore, this species is assumed not likely to be present within the Project Area due to lack of suitable habitat.

Monarch butterfly (*Danaus plexippus*), a candidate listed federal species, occurs in the vicinity (USFWS n.d.b, USFWS n.d.c, USFWS n.d.e). However, due to a lack of suitable habitat (i.e., milkweed [*Asclepias* spp.] plants and large trees) for feeding, migration, or overwintering, the monarch butterfly is not likely to be present within the Project Area.

5.3.2.4 State-Listed Species

ODFW maintains a list of native wildlife species in Oregon determined to be either threatened or endangered according to criteria set forth by rule (OAR 635-100-0105; ODFW 2021). According to ORBIC data, which is based on recorded observations, no state-listed threatened or endangered species are present in the Project Area. According to IPaC, there are no state-listed threatened or endangered terrestrial species known to occur within the Project Area. Two state-listed sensitive mammal species, one state-listed sensitive critical mammal species, and one state-listed sensitive critical bird species are known to occur within the Project Area (see Table 7).

The potential ranges are broad geographic ranges, such as “Washington” or “Western North America,” although there may not be suitable habitat in the entire range. For example, pygmy rabbit habitat does not include urban environments; therefore, it is not expected to be present within portions of the Project Area. Although the Project Area may not include suitable habitat for the terrestrial species listed in Table 7, they were taken into consideration as part of the potentially affected environment in this report.

Table 7. State Listed Species with a Potential Range in the Project Area

Description	Common Name (Scientific Name)	State Listing	Occurrence Potential ^a
Mammal	Pygmy rabbit (<i>Brachylagus idahoensis</i>)	Sensitive	Absent
	Spotted bat (<i>Euderma maculatum</i>)	Sensitive	Not Likely to Occur
	Townsend big-eared bat (<i>Corynorhinus townsendii</i>)	Sensitive Critical	Not Likely to Occur
Bird	Lewis’s woodpecker (<i>Melanerpes lewis</i>)	Sensitive Critical	Not Likely to Occur

Source: Adapted from Deschutes County 2023, USFWS n.d.b., and National Park Service 2020.

- a Not Likely to Occur = Habitat is only marginally suitable or is suitable but not within species geographic range;
May Occur = Species is expected to occur and habitat meets special requirements;
Absent = Habitat does not meet species requirements as currently understood in the scientific community;
Present = Known recent records. Species observed during recent survey.

Pygmy rabbit (*Brachylagus idahoensis*) is listed as a state sensitive species and was observed within the City of Redmond in 1972 (Table 6). It is known to occur in areas that include tall, dense stands of sagebrush and deep, loose soils (USFWS n.d.b, n.d.c, n.d.e). Large-scale fragmentation and loss of native shrub-steppe habitat has played a primary role in the long-term decline of the Columbia Basin species. The Project Area consists of urban development and fragmented native-shrub-steppe habitat; however, sagebrush is located throughout the Project Area. Pygmy rabbit habitat does not include urban environments, and the species is not expected to be present within those portions of the Project Area. According to Compass data, the closest estimated extent of pygmy rabbit range is approximately 7 miles north of the Project Area (ODFW n.d.a). Coordination with ODFW indicated that the rabbit's range within Deschutes County is currently limited to the County's farthest eastern extent, outside of the Bend metro area (A. Welch, ODFW personal communication, January 30, 2024). This species is therefore assumed to be absent from the Project Area.

Spotted bat (*Euderma maculatum*) is listed as a state sensitive species. This species roosts in cliff and canyon wall crevices and in trees adjacent to meadows (USFWS n.d.b). They typically forage in meadows, shrub-steppe, or along riparian corridors and water sources. While suitable habitat may be located within the Project Area, this species is sensitive to disturbance at roosts. Based on the urban development and noise levels within the Project Area, this species is not likely to occur within the Project Area.

Townsend big-eared bat (*Corynorhinus townsendii*) is listed as a state sensitive critical species. This species is known to use caves, mines, isolated buildings, hollow trees, and bridges for roosting (National Park Service 2020). They have highly specific roost requirements and are very sensitive to disturbance, and therefore, are not likely to occur within the Project Area.

Lewis's woodpecker (*Melanerpes lewis*) is listed as a state sensitive critical species. This species occurs in oak woodlands, oak-pine woodlands, cottonwood riparian forests, and areas burned by wildfires. While cottonwood is present within the Project Area, the landscape is primarily occupied by shrubs and grasses (USFWS n.d.b). Therefore, this species is not likely to occur within the Project Area.

5.3.3 Aquatic Species

5.3.3.1 General Fish and Aquatic Species

The PBC does not support game fish, salmonids, or threatened and endangered fish species. Fish screens compliant with Oregon Department of Fish and Wildlife (ODFW) standards were installed on the canal diversion from the Deschutes River at North Canal Dam (RM 164.8) in 2004 (ODFW n.d.b). These fish screens separate water diverted for consumptive use from water left in-stream, and they prevent fish from entering the District's irrigation conveyance system. However, amphibians may be present in the open irrigation canal and on adjacent banks where there is suitable vegetation.

Waterbodies associated with the Study Area, including the Crane Prairie Reservoir, Wickiup Reservoir, and Deschutes River, provide habitat to 22 documented species of fish, both native and non-native. Fish species present in these rivers include resident fish such as bull trout, spring and fall Chinook salmon (*Oncorhynchus tshawytscha*), mountain whitefish (*Prosopium williamsoni*), summer steelhead, rainbow trout (*Oncorhynchus mykiss*), redband trout (*Oncorhynchus mykiss* ssp.), and sockeye/kokanee (*Oncorhynchus nerka*). Non-native nuisance fish present include smallmouth bass (*Micropterus dolomieu*; ODFW 2023a).

In addition to fish, other aquatic species are potentially found within or along waterbodies associated with District operations, including the PBC. These aquatic species include resident amphibians such as western toad (*Anaxyrus boreas*), Pacific treefrog (*Pseudacris regilla*), and long-toed salamander (*Ambystoma macrodactylum*). These species are native to Oregon and may be present in open irrigation canals and adjacent banks where there is suitable vegetation (Oregon Watershed Plans 2020). Non-native nuisance aquatic species present include bullfrog (*Lithobates catesbeianus*) (Oregon Watershed Plans 2020). All these amphibians are listed as species of least concern by the International Union for Conservation of Nature (IUCN 2023).

Additional fish species present in the Study Area include introduced game fish, anadromous salmonids, and non-salmonids, some of which are listed as threatened, endangered, or candidate species under the ESA. Table 8 lists resident aquatic species found in the Study Area (Oregon Watershed Plans 2020).

Table 8. Fish and Aquatic Species Found in the Study Area

Common Name	Scientific Name	Deschutes ¹	Crooked ²	Origin	Threatened/ Endangered Status
Black crappie	<i>Pomoxis nigromaculatus</i>	No	Yes	Introduced	-
Bluegill	<i>Lepomis macrochirus</i>	No	Yes	Introduced	-
Bridgelip sucker	<i>Catostomus columbianus</i>	Yes	Yes	Native	-
Brook trout	<i>Salvelinus fontinalis</i>	Yes	No	Introduced	-
Brown bullhead catfish	<i>Ictalurus nebulosus</i>	Yes	Yes	Introduced	-
Brown trout	<i>Salmo trutta</i>	Yes	No	Introduced	-
Bullfrog	<i>Lithobates catesbeianus</i>	Yes	Yes	Introduced	-
Bull trout	<i>Salvelinus confluentus</i>	Yes	Yes	Native	State threatened
Chinook salmon (spring and summer)	<i>Oncorhynchus tshawytscha</i>	Yes	Yes	Native	-
Chiselmouth	<i>Acrocheilus alutaceus</i>	Yes	Yes	Native	-
Dace species	<i>Rhinichthys</i> spp.	Yes	Yes	Native	-
Largemouth bass	<i>Micropterus salmoides</i>	No	Yes	Introduced	-
Largescale sucker	<i>Catostomus macrocheilus</i>	Yes	Yes	Native	-

Common Name	Scientific Name	Deschutes ¹	Crooked ²	Origin	Threatened/ Endangered Status
Long-toed salamander	<i>Ambystoma macrodactylum</i>	Yes	Yes	Native	-
Mountain whitefish	<i>Prosopium williamsoni</i>	Yes	Yes	Native	-
Northern pike minnow	<i>Ptychocheilus oregonensis</i>	Yes	Yes	Native	-
Northwestern pond turtle	<i>Actinemys marmorata</i>	Yes	No	Native	Federal threatened
Oregon spotted frog	<i>Rana pretiosa</i>	Yes	Yes	Native	Federal threatened State threatened
Pacific treefrog	<i>Pseudacris regilla</i>	Yes	Yes	Native	-
Rainbow trout	<i>Oncorhynchus mykiss</i>	Yes	Yes	Introduced	-
Redband trout	<i>Oncorhynchus mykiss</i>	Yes	Yes	Native	-
Sculpin species	<i>Cottus</i> spp.	Yes	Yes	Native	Subspecies • <i>grotto</i> – federal endangered • <i>pygmy</i> – federal threatened
Smallmouth bass	<i>Micropterus dolomieu</i>	No	Yes	Introduced	-
Sockeye salmon/ kokanee	<i>Oncorhynchus nerka</i>	Yes	No	Native	-
Summer steelhead	<i>Oncorhynchus mykiss</i>	Yes	Yes	Native	Federal threatened
Three-spined stickleback	<i>Gasterosteus aculeatus</i>	Yes	Yes	Introduced	-
Tui chub	<i>Gila (Siphateles) bicolor</i>	Yes	No	Introduced	Federal threatened State threatened
Western toad	<i>Anaxyrus boreas</i>	Yes	Yes	Native	-

Adapted from Oregon Watershed Plans 2020 and StreamNet Mapper.

¹ Deschutes River from Wickiup Reservoir (river mile [RM] 226.8) to North Canal Dam (RM 164.8), North Canal Dam (RM 164.8) to Lake Billy Chinook (RM 120).

² Crooked River (RM 27.7) to mouth.

5.3.3.2 Fish Habitat and Migration

All the fish species listed in Table 8 are potentially present in the Deschutes River from Steelhead Falls (RM 128) to Lake Billy Chinook (RM 120) and in the Crooked River from RM 27.7 to its confluence with Lake Billy Chinook. Lake Billy Chinook is formed through the impoundment of the Crooked, Deschutes, and Metolius Rivers at the Pelton-Round Butte Dam Complex. The summer steelhead, Chinook salmon, and sockeye salmon in these waterbodies are part of a reintroduction effort that began in 2009 to mitigate for blocked fish passage at the Pelton-Round Butte Dam Complex (Oregon Watershed Plans 2020). Partners actively manage fish passage at the dam complex as a part of this effort.

Chinook and sockeye salmon are unable to navigate Steelhead Falls at RM 128, which creates the uppermost distribution limit for salmon in the Deschutes River (DSL 2023). Summer steelhead are able to pass upstream of Steelhead Falls but are unable to navigate upstream of Big Falls at RM 132. Big Falls is considered the uppermost limit of anadromous fish distribution (Oregon Watershed Plans 2020). Within the reach of the Crooked River that is associated with District operations (RM 0 to 27.7), there was one fish passage barrier, the Opal Springs Dam at RM 6.7, which was the second-highest-priority fish passage barrier in the state of Oregon. Upstream and downstream fish passage has been restored at the dam, eliminating the need for trap and haul methods.

Both native and introduced fish species are potentially present in the Deschutes River. Mountain whitefish and redband trout are native salmonid species found in the Deschutes River from North Canal Dam (RM 164.8) to the upper end of Lake Billy Chinook (RM 120). Bridgelip sucker, chiselmouth, largescale sucker, longnose dace, northern pike minnow, and sculpin species are native non-salmonid species found between Big Falls (RM 132) and Lake Billy Chinook (RM 120). Brook trout, brown trout, and rainbow trout are introduced salmonid species that are also found in the Deschutes River waterbodies associated with COID operations. Brown trout and brook trout were introduced to the Deschutes Basin by state and federal agencies in the early 1900s. Rainbow trout is a managed species that has been stocked in the Deschutes River and its lakes and tributaries for over 100 years. In the 1990s, ODFW adopted the Wild Fish Policy and stopped stocking rivers with hatchery-origin coastal rainbow trout to protect populations of native redband trout (Oregon Watershed Plans 2020). Rainbow trout are still found in areas of the Deschutes River.

The Crooked River from Lake Billy Chinook (RM 0) to RM 27.7 is expected to have similar fish species as the Deschutes River between North Canal Dam and Lake Billy Chinook. In 2004, the U.S. Geological Survey conducted visual assessments of fish assemblages in reaches of the Crooked River from RM 7.8 to RM 19.6. Mountain whitefish, sculpin species, dace species, chiselmouth, three-spined stickleback, rainbow trout, and northern pike minnow were observed during these surveys (Oregon Watershed Plans 2020). Since the late 1800s, changes to the Deschutes and Crooked Rivers' surface water flows, construction of fish passage barriers, and reservoir management have created a very different aquatic environment with resulting changes to the fish species assemblages.

Wickiup Reservoir operations have historically reduced outflow into the upper Deschutes River from September to November and released a regulated low flow of approximately 20.8 cfs during the non-irrigation season to promote winter water storage. Fall reductions in outflow from Wickiup Reservoir have contributed to streambeds and streambanks—especially inside channel habitats—becoming dewatered and exposed, thus diminishing suitable habitat for fish and other aquatic species (Oregon Watershed Plans 2020). During the remainder of the non-irrigation season, the regulated low flows in the main channel of the upper Deschutes River have, at times, exacerbated cold water

temperatures and, in severe winters, have enabled ice formation in-stream. Extremely cold and icy conditions can induce long periods of stress, promote direct fish mortality, or cause fish to crowd into deeper pools where they may be more susceptible to predation (Oregon Watershed Plans 2020).

Water management for irrigation use has typically resulted in low summer flows below Bend due to irrigation diversions. Elevated water temperatures in the upper and middle Deschutes River during the irrigation season negatively affect salmonid growth and survival (Oregon Watershed Plans 2020). The availability of cold water refugia for temperature-sensitive fish species is important when river temperatures rise above acceptable standards. Water temperatures that are out of the normal range for a given fish species can increase physiological stress, increase susceptibility to predators, and negatively influence growth rates, feeding, metabolism, and development.

5.3.3.3 Federally listed Fish and Aquatic Species

The ESA protects threatened and endangered species through a Section 7 consultation to ensure that proposed project-related actions are not likely to jeopardize the existence of any species (or a species' designated critical habitat) on the list. The ESA consultation process is under the jurisdiction of USFWS and NOAA Fisheries. An endangered species is defined by the ESA as "any species which is in danger of extinction throughout all or a significant portion of its range" (NOAA Fisheries n.d.a). A threatened species is defined by the ESA as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (NOAA Fisheries n.d.a).

Federally listed fish and aquatic species that are known to occur in the waterbodies associated with District operations or within the vicinity of the Project Area include Oregon spotted frog (USFWS n.d.a), northwestern pond turtle (*Actinemys marmorata*; ODFW n.d.c), and bull trout (USFWS n.d.c). None of these species are known to occur within the PBC.

Oregon Spotted Frog

USFWS lists Oregon spotted frog as threatened under the ESA. Oregon spotted frog and its designated critical habitat occur in the Deschutes River upstream of Bend (river mile [RM] 173) including in Wickiup and Crane Prairie Reservoirs (Oregon Watershed Plans 2020). Critical habitat for Oregon spotted frog is not mapped within the existing PBC or the locations of the proposed alternatives. USFWS has identified primary constituent elements (PCEs) for Oregon spotted frog critical habitat (Oregon Watershed Plans 2020). PCEs represent the biological and physical features that are essential to the conservation of a species and describe habitat components that support one or more life stages of the species. PCEs for Oregon spotted frog describe areas that have appropriate water depths and refuge from predators, aquatic connectivity, and absence of non-native predators. A detailed list of Oregon spotted frog Critical Habitat PCEs is provided in Table 9.

Table 9. Primary Constituent Elements for Oregon Spotted Frog Critical Habitat

Primary Constituent Element Number	Habitat Description	Characteristics
PCE 1	Nonbreeding (N), breeding (B), rearing (R), and overwintering habitat (O). Ephemeral or permanent bodies of fresh water, including, but not limited to, natural or humanmade ponds, springs, lakes, slow-moving streams, or pools within or oxbows adjacent to streams, canals, and ditches.	- Inundated for a minimum of 4 months per year (B, R) (timing varies by elevation but may begin as early as February and last as long as September). - Inundated from October through March (O). - If ephemeral, areas are hydrologically connected by surface water flow to a permanent waterbody (e.g., pools, springs, ponds, lakes, streams, canals, or ditches) (B, R). - Shallow water areas (less than or equal to 12 inches, or water of this depth over vegetation in deeper water (B, R). - Total surface area with less than 50% vegetative cover (N). - Gradual topographic gradient (less than 3% slope) from shallow water toward deeper, permanent water (B, R). - Herbaceous wetland vegetation (i.e., emergent, submergent, and floating-leaved aquatic plants) or vegetation that can structurally mimic emergent wetland vegetation through manipulation (B, R). - Shallow water areas with high solar exposure or low (short) canopy cover (B, R). - An absence or low density of non-native predators (B, R, N).
PCE 2	Aquatic movement corridors. Ephemeral or permanent bodies of fresh water.	- Less than or equal to 3.1 miles linear distance from breeding areas. - Impediment-free (including, but not limited to, hard barriers such as dams, impassable culverts, or lack of water; biological barriers such as abundant predators; or lack of refuge from predators).
PCE 3	Refugia Habitat	Nonbreeding, breeding, rearing, or overwintering habitat or aquatic movement corridors with habitat characteristics (e.g., dense vegetation and/or an abundance of woody debris) that provide refuge from predators (e.g., non-native fish or bullfrogs).

Source: Adapted From: Oregon Watershed Plans 2020

Northwestern Pond Turtle

USFWS lists northwestern pond turtle as threatened under the ESA, and critical habitat is not designated. Northwestern pond turtle habitat requires aquatic features such as ponds, lakes, and streams for breeding, feeding, overwintering, sheltering, and dispersal; basking sites that allow for thermoregulation; and terrestrial or upland features adjacent to the aquatic habitat for nesting, overwintering and aestivation, and dispersal and connectivity between populations (88 FR 68370). Northwestern pond turtle is omnivorous and considered a dietary generalist, consuming a wide variety of food items including small aquatic invertebrates (insect larvae) and vertebrates (fish, tadpoles, and frogs), carrion, and plant material (88 FR 68370). In Oregon, it is primarily found west of the Cascades at elevations lower than 6,000 feet. The largest populations are located in the drainages of the Willamette, Umpqua, Rogue, and Klamath Rivers, but smaller populations are scattered throughout lowland aquatic habitats of western Oregon and the east Cascades (Oregon Conservation Strategy n.d.). According to Compass data, the closest distribution range of this species is located approximately 39 miles west of the Project Area (ODFW n.d.a).

Bull Trout

USFWS lists bull trout as threatened under the ESA, and critical habitat for this species is designated. Within the project vicinity, bull trout are known to be present in the Deschutes River from Big Falls (RM 132) to Lake Billy Chinook (RM 120) (Oregon Watershed Plans 2020). According to ORBIC data, bull trout occur within the Study Area in the Deschutes River upstream of Bend (RM 173) and in Wickiup and Crane Prairie Reservoirs. Designated critical habitat for bull trout does not occur within the Study Area, but it does occur in the Deschutes River downstream of the Study Area from Big Falls (RM 132) to Lake Billy Chinook (RM 120) (RM 27.7; Oregon Watershed Plans 2020). The Critical Habitat PCEs for bull trout describe habitat that has aquatic connectivity, complex habitat structure, water temperatures ranging from 35.6 to 59 degrees Fahrenheit (F), natural variability in streamflow, a sufficient food base, and the absence of non-native predatory and competing fish (Oregon Watershed Plans 2020). A detailed list of Critical Habitat PCEs for bull trout is provided in Table 10. Although critical habitat for bull trout is designated in the Deschutes River from Big Falls to Lake Billy Chinook, a 2014 study found no evidence of bull trout in this section of the Deschutes River (Oregon Watershed Plans 2020).

Table 10. Primary Constituent Elements for Bull Trout Critical Habitat

Primary Constituent Element Number	Habitat Description and Characteristics
PCE 1	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.
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.
PCE 3	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

Primary Constituent Element Number	Habitat Description and Characteristics
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.
PCE 5	Water temperatures ranging from 2 to 15 degrees Celsius (C; 36 to 59 degrees 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.
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.
PCE 7	A natural hydrograph including peak, high, low, and base flows within historical and seasonal ranges, or if flows are controlled, minimal flow departure from a natural hydrograph.
PCE 8	Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.
PCE 9	Sufficiently low levels of occurrence of non-native 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.

Source: Adapted From: Oregon Watershed Plans 2020

Steelhead

Steelhead populations listed as threatened under ESA (Middle Columbia River [MCR] steelhead distinct population segment [DPS]) can potentially access the Deschutes River as far upstream as Big Falls (RM 132.0, 32 river miles downstream from the PBC diversion). They are assumed to be present up to that point (Oregon Watershed Plans 2020). The MCR steelhead population in the middle Deschutes River above the Pelton-Round Butte Project was re-introduced as a nonessential experimental population under Section 10(j) of the ESA. The 10(j) designation was removed on January 15, 2025, and the population is currently listed as threatened (89 FR 15168). Designated critical habitat for steelhead does not occur within the Study Area, but it does occur in the Deschutes River downstream of the Study Area from Warm Springs (RM 97) to Heritage Landing (RM 0.4) and throughout Shitike Creek (NOAA Fisheries 2023c), approximately 29 miles north of the Study Area. Steelhead require cold-water streams with adequate dissolved oxygen, generally preferring fast water in small-to-large mainstem rivers and medium-to-large tributaries. Spawning habitat consists of gravel substrate free of excessive silt (USFS 2023). According to Oregon Fish Habitat Distribution and Barriers (ODFW n.d.b), steelhead historically

used segments of the Deschutes River located within the Study Area; however, they do not currently use these segments of the Deschutes River.

Chinook Salmon

Chinook salmon in the Deschutes River are grouped into fall and spring runs. Deschutes fall Chinook begin entering the river in August and peak in late September and early October. Spawning typically begins in October and continues until late December. Fall Chinook are often observed spawning from 2 feet to several feet deep in the Deschutes River from RM 0 at the confluence with the Columbia River to RM 100, just upstream from Warm Springs (ODFW 2023b). Spring Chinook are less abundant than fall Chinook and spawn in more limited areas. Adult fish return to the Deschutes River in April and May and head toward two tributaries on the lower river: the Warm Springs River and Shitike Creek. Spring Chinook historically spawned in the Upper Deschutes Basin, but the construction of the Pelton-Round Butte hydropower complex closed off the upper watershed to Spring Chinook in 1968 (Oregon Explorer 2023). While listed as a threatened species in other parts of its range, and Upper Columbia River spring-run Chinook salmon is listed as endangered, the species is not listed in the Deschutes Basin. It is not expected to become listed in the basin in the foreseeable future. As with steelhead, Chinook salmon is the subject of an ongoing reintroduction upstream of Pelton-Round Butte Hydroelectric Project (USFWS and NMFS 2020).

5.3.3.4 State Listed Species

ODFW maintains a list of native wildlife species in Oregon that have been determined to be either threatened or endangered according to criteria set forth by OAR 635-100-0105 (ODFW 2021). There are no threatened, endangered, or candidate fish or aquatic species known to occur within the waterbodies associated with COID operations or within the Project Area. However, bull trout, discussed in Table 10, is designated as a species of concern in the state of Oregon; northwestern pond turtle, discussed above, is designated as a sensitive critical species in the state of Oregon; and western toad, discussed further below, is designated as a sensitive species in the state of Oregon. Bull trout and northwestern pond turtle are not known to occur within the PBC within the Project Area.

Western toad is listed as a state sensitive critical species. They are known to occur in a variety of aquatic and upland habitats near waterbodies, including mountain meadows, desert flats, and forested areas (ODFW. n.d.c). They typically breed in shallow, sandy margins of small waterbodies including wetlands, ponds, and lakes. They prefer extensive, sunny shallows with short, sparse, or no vegetation for egg-laying and for tadpole schools to move widely as they forage on organic mud and surface diatoms. According to the ODFW Compass database, this species occurs throughout the length of the existing PBC (ODFW n.d.a).

5.3.4 Wetlands

Wetlands perform a number of valuable functions including water storage, water filtration, and biological productivity. They can also support complex food chains that provide sources of nutrients to plants and animals and provide specialized habitat for a wide variety of aquatic and terrestrial species. Because the project area is limited to the existing PBC alignment and the alignment options, jurisdictional waters are not assumed to be present in the project area. Wetlands in the area associated with the proposed action may be subject to federal or state regulations depending on their

characteristics. Within the state of Oregon, wetlands are managed under two regulations: the CWA and Oregon Removal-Fill Law.

5.3.4.1 Study Area

Water typically flows through the PBC during the irrigation season (April to October). Water may also occasionally flow through the canal outside of the irrigation season for stock water deliveries or be present as standing water following rain or snow events. Hydrophytic plants are sometimes found along the banks of the PBC within the Project Area, or in adjacent low-lying areas outside of the Project Area, as the hydrology provided by the PBC can create favorable growing conditions during a portion of the year. See Table 11.

Through analysis of the NWI Wetlands Mapper and aerial imagery, four potential sites in or adjacent to the Project Area were identified as freshwater emergent wetlands that could be affected by the proposed project (Appendix B). The NWI data were used as a first-step approach in identifying and evaluating potential wetlands in the Project Area. Parametrix performed an informal off-site wetland inventory in October 2021 and identified only artificial wetlands that were non-jurisdictional under federal or state regulation.

An adjacent 9.99-acre palustrine freshwater emergent wetland is mapped on the east side of the PBC along Northwest Canal Boulevard, north of NW Maple Avenue and south of Oak Tree Lane, in Redmond (USFWS n.d.d). The land is currently developed with a commercial building and a parking lot. According to NRCS, hydric soils are not present (NRCS, USDA n.d.). During the 2021 informal off-site wetland inventory, upland conditions were observed. Based on the absence of hydric soils, existing commercial development, and likely upland conditions, it is presumed the adjacent NWI-mapped feature is not a wetland.

A 13.23-acre palustrine freshwater emergent wetland is mapped within the Study Area approximately 125 feet east of the PBC between NW Quince Avenue and Oak Tree Lane in Redmond (USFWS n.d.d). The land is currently undeveloped and bounded by commercial and residential development. According to NRCS, hydric soils are not present (NRCS, USDA n.d.). During the 2021 informal off-site wetland inventory, upland conditions were observed. Based on the absence of hydric soils, surrounding development, and likely upland conditions, it is presumed the project-vicinity NWI-mapped feature is not a wetland.

A 0.37-acre palustrine freshwater pond and 1.23-acre palustrine freshwater emergent wetland are mapped in the project vicinity south of NE King Way between NE 5th Street and NE 17th Street in Redmond (USFWS n.d.d). These features are bounded by agricultural land and residential properties. According to NRCS, hydric soils are not present (NRCS, USDA n.d.). According to a review of aerial imagery, a unique aerial signature was noted in the location of the mapped NWI features indicating the presence of a wetland (Google Earth 2023). Based on a review of aerial imagery, it is presumed that the adjacent NWI feature is a wetland.

A 1.11-acre palustrine freshwater emergent wetland, 0.65-acre palustrine freshwater scrub-shrub wetland, and 0.69-acre palustrine freshwater pond are mapped within the Study Area north of the PBC and south of the intersection of SW 46th Street and SW 43rd Street in Redmond (USFWS n.d.d). The features are mapped in an area of agricultural and residential development. According to NRCS, hydric soils are not present (NRCS, USDA n.d.). During the 2021 informal off-site wetland inventory,

hydrophytic plants and the mapped NWI features were observed. Based on the presence of hydrology and hydrophytic plants, it is presumed the adjacent NWI features are wetlands.

Table 11. Wetland Features Identified within the Study Area

Site Location	Size (acres)	Mapped Cowardin Classification (NWI)	Wetland Indicators Observed	Presumed Wetland	Presumed Jurisdictional
East side of PBC at NW Canal Boulevard, north of NW Maple Avenue and south of Oak Tree Lane, Redmond	9.99	Palustrine emergent (PEM)	None (upland conditions observed)	No	No
125 feet east of PBC between NW Quince Avenue and Oak Tree Lane, Redmond	13.23	Palustrine emergent (PEM)	None (upland conditions observed)	No	No
South of NE King Way between NE 5th Street and NE 17th Street, Redmond	0.37	Freshwater pond	N/A. Unique aerial signature indicating the presence of a wetland (Google Earth 2023). Not field verified.	Yes	No
	1.23	Palustrine emergent (PEM)	N/A. Unique aerial signature indicating presence of a wetland (Google Earth 2023). Not field verified.	Yes	No
North of PBC, south of the intersection of SW 46th Street and SW 43rd Street, Redmond	1.11	Palustrine emergent (PEM)	Wetland hydrology, hydrophytic plants	Yes	No
	0.65	Palustrine scrub-shrub (PSS)	Wetland hydrology, hydrophytic plants	Yes	No
	0.69	Freshwater pond	Wetland hydrology, hydrophytic plants	Yes	No

5.3.4.2 North Unit Main Canal

The North Unit Main Canal parallels the PBC for approximately 1.5 miles downstream from its diversion at the North Canal Dam. The two canals are in close proximity over this distance and at times are less than 50 feet apart. Vegetation along the North Unit Main Canal is minimal due to the North Unit Irrigation District (NUID) vegetation management program. Hydrophytic plants are sporadically found along the banks of the canal and in adjacent low-lying areas, predominantly consisting of grasses and weeds such as reed canarygrass and sedges. Vegetation adjacent to the canal is influenced by seepage from the canal (Oregon Watershed Plans 2020). Based on review of aerial imagery and NWI Wetlands Mapper data, jurisdictional wetlands are assumed not to be present (USFWS n.d.d). After the initial

1.5-mile-reach beginning at the diversions from the Deschutes River, the PBC and North Unit Main Canal diverge substantially, and the North Unit Main Canal is no longer located within the Study Area.

5.3.4.3 Wetlands Associated with District Operations

Wetlands are found within and adjacent to Crane Prairie Reservoir, Wickiup Reservoir, and segments of the Deschutes River associated with District operations. The types of wetlands that are found include marshes and wet meadows that are dominated by herbaceous plants, as well as swamps dominated by herbaceous plants, shrubs, or trees (Oregon Watershed Plans 2020). Riparian areas of varying size and quality occur adjacent to natural waterbodies associated with District operations. Low streamflow in late fall, winter, and early spring associated with upstream reservoir storage limits riparian vegetation in the Deschutes River (Oregon Watershed Plans 2020). Low streamflow along these reaches can expose the channel bed and riverbanks, facilitating increased erosion and fine sediment delivery following freeze-thaw processes and increased spring streamflow (Oregon Watershed Plans 2020). Because streamflow is strongly correlated with critical physical and biological characteristics of the river, it influences the functions of the associated riparian areas (Oregon Watershed Plans 2020). As riparian areas become hydrologically disconnected from their adjacent stream channels, they lose many of their ecological functions.

6. IMPACT ASSESSMENT METHODOLOGY AND DATA SOURCES

6.1 Long-Term Impact Assessment Methods

Vegetation, wildlife, aquatic species, and wetlands within the Project Area were evaluated for potential long-term impacts. Project design and engineering and anticipated acquisitions and displacements were evaluated alongside property boundary maps to determine potential physical impacts. Additional impacts to other resources, including visual and noise and vibration effects, were also considered. The analysis of direct long-term vegetation, wildlife, aquatic species, and wetlands impacts considered the following:

- Effects on water sources for wildlife and the resulting effects on wildlife distribution patterns.
- Effects on wetland hydrology currently provided by the canal and the resulting effects on aquatic species and habitat.
- Modification of habitat connectivity and/or habitat removal and the resulting effects on terrestrial wildlife and aquatic species.
- Effects of changes in human presence on wildlife.

6.2 Short-Term (Construction) Impacts Assessment Methods

Short-term impacts are primarily related to the effects of construction during the PBC piping project that would be temporary in nature. The analysis of direct short-term species impacts considered the following:

- Construction impacts to water quality and the effects on vegetation, wildlife, and aquatic species.

- Increased human presence and its effects on wildlife.
- Ground disturbance effects on vegetation and wildlife.

6.3 Indirect Impact Assessment Methods

Indirect impacts are impacts that would result from the Project, that would occur later in time or beyond the Project Area, and that would be reasonably foreseeable. Potential indirect impacts to vegetation, wildlife, aquatic species, wetlands, and waters were assessed, taking into account how displacements could affect future dispersal and migration in the project vicinity and how piping of the PBC could impact species that have historically relied on the canal as a water source.

6.4 Cumulative Impact Assessment Methods

Cumulative impacts result from the incremental impact of a specific action when added to other past, present, and reasonably foreseeable future actions. The cumulative impacts analysis considered the long-term and short-term impacts of the alignment options to vegetation, wildlife, aquatic species, and wetlands and waters. Based on the list of foreseeable transportation and other development projects that are anticipated to occur in the project vicinity within the same timeframe, as well as relevant past actions that have defined the project vicinity, a qualitative analysis examined potential cumulative effects for vegetation, wildlife, aquatic species, and wetlands and waters. The analysis of potential cumulative vegetation, wildlife, and aquatic species impacts addresses both short-term construction effects and long-term operational impacts.

7. ENVIRONMENTAL CONSEQUENCES

7.1 Long-Term Impacts

7.1.1 No Action Alternative

Under the No Action Alternative, existing conditions would remain unchanged. If construction did not take place, there would be minimal to no overall impacts to vegetation, wildlife, aquatic species, or wetlands and waters beyond those resulting from existing water management under current conditions.

7.1.2 Modernization Alternative (Full Piping)

Under the Modernization Alternative, piping the PBC would remove the influence of the existing open canal on vegetation, wildlife, aquatic species, and wetlands within the study area.

Vegetation

Full piping of the PBC would remove a source of hydrology for existing hydrophytic vegetation along portions of the canal. The Project Area would transition from an open canal (with or without water, depending on season) with adjacent plant species characteristic of wet sites to upland vegetation, similar to the native vegetated habitats that were present prior to construction of the canal. While wetland vegetation currently present along the canal would be permanently lost, natural wetland

habitat exists elsewhere in the Deschutes River system, and piping the PBC would not be expected to affect the population-level viability of native wetland plant species overall.

There is potential for Peck's milkvetch to be present within the Study Area. However, to date the District has recorded no observations of this species in the Study Area. Potential future occurrences of Peck's milkvetch are anticipated to be limited in number, and the Modernization Alternative would not be expected to affect the species on a population level.

Implementation of the Modernization Alternative would remove opportunities for aquatic noxious weeds in the Project Area to be transported to other areas of the District. After construction, disturbed areas adjacent to the canal would be restored to near-previous contours, and the area over the pipe would be graded to blend with the surrounding landscape. Disturbed areas, including those areas above the newly buried pipes, would be recontoured with topsoil and vegetated with an NRCS-approved seed mix of grasses and forbs. Tree removal, where unavoidable, would be mitigated through on-site and in-kind replacement to the greatest extent feasible. Where permanent tree removal would be necessary due to potential pipe damage from tree roots, alternative mitigation approaches would be implemented in accordance with the Bend, Redmond, or Deschutes County tree protection code through coordination with the appropriate city or county jurisdiction. Revegetation of the corridor could require future monitoring and management. Overall, implementation of the Modernization Alternative would have a minor long-term effect on vegetation, because disturbance would occur over about 1% of the District and measures designed to minimize effects on vegetation would be implemented.

Wildlife

Over time, the Modernization Alternative could lead to minor long-term effects on terrestrial wildlife. The removal of a seasonal water source could result in changes in the distribution patterns of wildlife on the landscape as they seek water sources elsewhere. The Modernization Alternative would potentially reduce human presence throughout the Project Area, as fewer trips to maintain the PBC and headgates would be necessary. This would result in lower potential for human wildlife conflicts and improve seclusion for wildlife. Piping the PBC would remove a barrier to movement of ungulates and other terrestrial wildlife and eliminate potential adverse effects on wildlife due to the risk of becoming trapped in the canal and drowning. Habitat fragmentation would be reduced, and small animal habitat would have greater connectivity. Reseeding with NRCS-approved seed mix of grasses and forbs would also create habitat benefits for some terrestrial wildlife species.

Aquatic Species

The COID irrigation diversions are screened and the conveyance systems do not provide passage or habitat for fish (ODFW n.d.b). Therefore, implementation of the Modernization Alternative would have no effect on fish within the COID irrigation infrastructure.

Implementation of the Modernization Alternative would result in a minor long-term impact to some common aquatic and riparian species in the PBC such as western toad, Pacific treefrog, and long-toed salamander. These species would lose habitat currently provided by the PBC. However, the existing habitat is low quality, available only when the canals carry water, and it is not considered critical to the long-term survival of these species.

Following completion of the Modernization Alternative, the water saved would be used to fulfill COID and NUID patrons' water rights. This would result in more reliable water delivery to irrigators, given the requirements for compliance with the DBHCP conservation measures, but generally would not alter

available streamflow for aquatic species within the Deschutes River after the first year of Project operation. Because the first project group would be completed immediately prior to the 2027 irrigation season (i.e., during Year 7 of DBHCP implementation), water savings would begin accruing for winter release from Wickiup Reservoir while the DBHCP required flow regime for Years 1-7 is in effect. The water saved during the 2027 irrigation season would be allocated for winter release from Wickiup Reservoir in addition to the 100 cfs minimum release for Years 1 through 7. Because the Modernization Alternative would increase winter streamflows below Wickiup Reservoir beyond the minimum required by the DBHCP, it would have beneficial effects on Oregon spotted frog and its habitat in the Deschutes River upstream of Bend for the first winter of Project operation.

Beginning in 2028 (Year 8 of DBHCP implementation), the DBHCP-mandated minimum winter releases from Wickiup Reservoir would increase to 300 cfs. After this time, the water saved during the irrigation season under the Modernization Alternative would simply be allocated to supplying a portion of the stored water in Wickiup Reservoir that would be used to generate the total 300 cfs winter release volume. From 2028 on, the Modernization Alternative would not affect streamflow levels and therefore is not expected to have any beneficial or adverse effects on aquatic species within waterbodies affected by District operations.

Wetlands

Implementation of the Modernization Alternative would result in a negligible long-term impact to wetlands located adjacent to the PBC. While the canal is currently dry outside of the irrigation season, the implementation of the Modernization Alternative would create a minor long-term impact by removing water from the canal on a permanent basis, thus removing a water resource that may serve the adjacent wetlands. After completion of pipe installation, seepage losses would be eliminated, potentially limiting the water available to the wetlands if they depend upon canal seepage for hydrology.

While the effects of this alternative could reduce water availability to wetlands and hydrophytic vegetation occurring near the Project Area, the anticipated effects on wetlands would be negligible, as the surrounding area is highly developed, disturbed, and fragmented by urbanization.

Artificial fringe wetlands that may be present receive hydrology directly from irrigation flows and are likely less than 1 acre; are likely not jurisdictional. Therefore, while implementation of the Modernization Alternative would remove the current source of hydrology for these artificial wetlands, it would not be expected to have effects on jurisdictional wetland resources.

7.1.2.2 Deschutes County/North Bend Options

No Modernization within this Segment (No Piping)

Under this option, the PBC alignment in this area would remain as-is and there would be no impacts to vegetation, wildlife, or aquatic species.

Pilot Butte Canal Alignment (Existing Canal Route)

Piping within the existing PBC in this segment would have similar effects to those described in Section 7.1.2 (full piping), and it would remove the influence of the existing open canal on vegetation, wildlife, aquatic species, and wetlands within the Study Area.

NE 18th Street Alignment

Vegetation

Under the NE 18th Street alignment option, the existing PBC would remain in its current state in this portion of its alignment, but would no longer receive water from COID facilities. While the canal is currently dry outside of the irrigation season, this option would create a minor long-term impact by removing water from the canal on a permanent basis, potentially altering existing vegetation and habitat present. Because implementation of this alignment would take place along NE 18th Street where native vegetation is largely absent, it would largely impact lawns and streetscape plantings that would be replanted following construction. Therefore, implementation of this option would not result in long-term impacts to vegetation along NE 18th Street.

Wildlife

Under the NE 18th Street option, the existing PBC would remain in its current state in this portion of its alignment but it would no longer receive water from COID facilities. While the canal is currently dry outside of the irrigation season, this option would create minor long-term impact by removing water from the canal on a permanent basis, potentially altering wildlife distribution patterns. However, the pipe in NE 18th Street would be underneath the location of the existing street. It would not have long-term noise, visual, access, or other impacts to wildlife beyond the existing conditions related to the street's presence and usage.

Aquatic Species

Under the NE 18th Street option, the existing PBC would remain in its current state in this portion of its alignment, but it would no longer receive water from COID facilities. While the canal is currently dry outside of the irrigation season, this option would create a minor long-term impact by removing water from the canal on a permanent basis, thus removing habitat currently provided to aquatic species. However, the current habitat is low quality, and long-term impacts from leaving this portion of the canal waterless would be negligible. Additionally, under this alignment option the pipe would be located beneath the existing NE 18th Street right-of-way and would not have long-term noise, visual, access, or other impacts to fish species.

Wetlands

Wetlands are not anticipated to be present in this alignment option. Artificial fringe wetlands that may be present adjacent to the PBC in this segment receive their hydrology directly from irrigation flows and are likely less than 1 acre; they are likely not jurisdictional. The pipe in NE 18th Street would be under the location of the existing street, and it would not have long-term noise, visual, access, or other impacts to wetlands. Therefore, implementation of this alternative would not result in impacts to jurisdictional wetlands.

Old Deschutes Road Alignment

Vegetation

Under the Old Deschutes Road option, the existing PBC would remain in its current state in this portion of its alignment but would no longer receive water from COID facilities. While the canal is currently dry outside of the irrigation season, this option would create minor long-term impacts by removing water from the canal on a permanent basis, altering the existing vegetation and habitat present. Minor short-term impacts to herbaceous vegetation would result from pipe installation, because vegetation

removal and excavation would be required in currently undeveloped areas of this alignment. Disturbed areas would be recontoured with topsoil and vegetated with an NRCS-approved seed mix of grasses and forbs. Tree removal, where unavoidable, would be mitigated through on-site and in-kind replacement to the greatest extent feasible. Where permanent tree removal would be necessary due to potential pipe damage from tree roots, alternative mitigation approaches would be implemented in accordance with Bend's tree protection code through coordination with the City of Bend. Revegetation could require future vegetation monitoring and management. Overall, implementation of the Modernization Alternative would have a minor long-term effect on vegetation, because disturbance would occur over about 1% of the District and measures designed to minimize effects on vegetation would be implemented.

Wildlife

Under the Old Deschutes Road option, the existing PBC would remain in its current state in this portion of its alignment but would no longer receive water from COID facilities. While the canal is currently dry outside of the irrigation season, this alternative would create a minor long-term effect by removing water from the canal on a permanent basis, potentially altering wildlife distribution patterns. Minor short-term effects would result from the temporary removal of vegetated habitat in currently undeveloped areas of the alignment where ground clearing and excavation are necessary to install the pipe. These areas would be backfilled, restored to previous contours, and seeded with a NRCS-approved seed mix. In the long term, the pipe would be located underground, and it would not have long-term noise, visual, access, or other impacts to wildlife.

Aquatic Species

Under the Old Deschutes Road option, the existing PBC would remain in its current state in this portion of its alignment but would no longer receive water from COID facilities. While the canal is currently dry outside of the irrigation season, this alternative would create minor long-term impacts by removing water from the canal on a permanent basis, thus removing habitat currently provided to aquatic species. However, the current habitat is low quality, and long-term impacts from piping of the canal would be negligible. Additionally, the pipe would be located underground, and it would not have long-term noise, visual, access, or other impacts to fish species.

Wetlands

Jurisdictional wetlands are not anticipated to be present in this alignment option. Artificial fringe wetlands that may be present receive hydrology directly from irrigation flows and are likely less than 1 acre; they are likely not jurisdictional. Therefore, implementation of this alternative would not result in impacts to wetland resources.

7.1.2.3 City of Redmond Options

No Modernization within this Segment (No Piping)

Under this option, the PBC alignment in this segment of the Project Area would remain as-is and there would be no impacts to vegetation, wildlife, or aquatic species.

Pilot Butte Canal Alignment (Existing Canal Route)

Piping within the existing PBC in this segment would have similar effects to those described in Section 7.1.2 (full piping) and would remove the influence of the existing open canal to vegetation, wildlife, aquatic species, and wetlands within the Study Area.

Piping to the East in the Watermaster's Access Road

Vegetation

Under the Watermaster's Access Road option, the existing PBC would remain in its current state in this portion of its alignment but would no longer receive water from COID facilities. While the canal is currently dry outside of the irrigation season, this option would create a minor long-term impact by removing water from the canal on a permanent basis, altering the existing vegetation and habitat present. Ground disturbance during pipe construction would have temporary effects on herbaceous vegetation; however, these areas would be recontoured with topsoil and re-seeded with an NRCS-approved seed mix. If permanent tree removal became necessary in or adjacent to the proposed alignment and tree replacement was not feasible due to the potential for roots to damage the pipe, minor and localized long-term effects on vegetation would result. These unavoidable long-term effects would be mitigated according to the tree protection provisions of the Redmond Development Code. Overall long-term effects would be minor because the types of vegetated habitats that would be affected are not limited on the overall landscape.

Wildlife

Under the Watermaster's Access Road option, the existing PBC would remain in its current state in this portion of its alignment but would no longer receive water from COID facilities. While the canal is currently dry outside of the irrigation season, this option would create a minor long-term impact by removing water from the canal on a permanent basis, causing wildlife to seek alternate water sources elsewhere. Disturbance to vegetated habitat along this alignment during pipe construction would have temporary effects on wildlife that use these habitats, because they would be displaced from the area. Where permanent tree removal may be necessary in or adjacent to the proposed alignment, and tree replacement is not feasible due to the potential for roots to damage the pipe, avian and small mammal species that use the trees would be permanently displaced. However, effects would be minor because this habitat type is not limited on the landscape. Because the pipe would be underground, beneath the location of the existing Watermaster's Access Road, it would not have long-term noise, visual, access, or other impacts to wildlife beyond the existing conditions related to the road's presence and usage.

Aquatic Species

Under the Watermaster's Access Road option, the existing PBC would remain in its current state in this portion of its alignment but would no longer receive water from COID facilities. While the canal is currently dry outside of the irrigation season, this option would create minor long-term impacts by removing water from the canal on a permanent basis, removing habitat currently provided to aquatic species. However, the current habitat is low quality and long-term impacts from piping of the canal would be negligible. Additionally, the pipe would be located beneath the existing Watermaster's Access Road and would not have long-term noise, visual, access, or other impacts to fish and other aquatic species.

Wetlands

Jurisdictional wetlands are not anticipated to be present in this alignment. Existing fringe wetlands that may be present receive hydrology directly from irrigation flows and are likely less than 1 acre; they are likely not jurisdictional. Implementation of this option would not be expected to result in impacts to jurisdictional wetlands.

Piping to the West within Northwest Canal Boulevard

The effects of this alignment would generally be similar to those described for the Watermaster's Access Road alignment above. Because the Northwest Canal Boulevard alignment would traverse a more developed roadway corridor than the Watermaster's Access Road option, less habitat is available and fewer resources are present. Therefore, while similar to the effects of the Watermaster's Access Road alignment option, the effects of piping to the west within Northwest Canal Boulevard would be relatively less pronounced.

7.2 Short-term Impacts (Construction Impacts)

7.2.1 Modernization Alternative (Full Piping)

For the Modernization Alternative and all piping options, construction activities would include vegetation clearing, trenching, equipment mobilizing and staging, and backfilling of trenches after pipe installation. Blasting could potentially be required anywhere along the pipe alignment to allow for pipe construction in areas of shallow bedrock. Vegetation clearing would be minimized to the extent practicable, and reseeding would be completed after construction. Tree removal would be avoided as much as possible and would only occur where no feasible alternative is available due to construction requirements, worker safety, or potential risk of damage to the pipeline. Blasting impacts would be minimized through the use of BMPs identified in Section 8 below and discussed in detail in the Noise and Vibration Technical Report.

Vegetation

Construction impacts to vegetation would include temporary disturbance to surrounding vegetation from construction activities and equipment. During construction, herbaceous, shrub, and woody vegetation along the canal and within the Project Area would be disturbed through activities such as clearing, crushing, and digging. Mature trees would only be removed if they presented a safety risk to crews during construction if access to the construction site was infeasible without tree removal, or if a tree's close proximity to the pipe posed a risk of damage to the pipe from ongoing root growth. Tree protection would be installed during construction to assist construction crews in avoiding impacts to existing mature trees to the greatest extent feasible. Opportunistic hydrophytic plants that occur sporadically along the margins of the PBC would be permanently removed. There is potential to spread noxious weeds through the movement of construction vehicles which could provide opportunities to transport weeds to new locations. Best management practices (BMPs) would be implemented during construction to reduce this risk.

Although vegetation would be removed, it would be replaced with NRCS-approved plant species as part of the Project's mitigation. In the long term, this would result in a net increase in herbaceous vegetation where the pipe is placed within the existing PBC alignment because the area above the pipe would be backfilled, recontoured with topsoil, and vegetated with a seed mix of NRCS-approved grasses and forbs.

In areas where tree removal could not be avoided, trees would be replaced on-site and in-kind wherever possible. Where permanent tree removal would be required to avoid potential pipe damage from root growth, appropriate mitigation measures would be determined through coordination with the appropriate jurisdiction (Bend, Redmond, or Deschutes County) based on the applicable tree protection code.

Disturbance due to off-road construction vehicles or equipment could threaten the persistence of Peck's milkvetch in the Study Area. However, there have been no observations by the District of Peck's milkvetch in the Study Area. Additionally, the Study Area does not encroach on the Peck's milkvetch ACEC.

Wildlife

Construction impacts to wildlife would include temporal loss of habitat and noise impacts from construction activities, equipment, and human disturbance. Terrestrial wildlife could experience noise disturbance due to heavy equipment operation or habitat removal due to ground disturbance, tree cutting, or vegetation removal. However, most wildlife in the area are accustomed to noise and these disturbances are anticipated to be minor. Blasting noise could cause terrestrial wildlife to avoid areas of active blasting and the surrounding vicinity for the duration of blasting activities, resulting in minor to moderate adverse effects. Because the habitats used by terrestrial wildlife near the PBC are not limited on the regional landscape, it is expected that wildlife could relocate to other areas of suitable habitat. Following completion of construction activities, it is expected that wildlife species would return to their previously used terrestrial habitats near the PBC.

Wintering or migrating birds would be minimally affected by construction disturbance because they have the flexibility to move away from disturbances to other suitable areas. There is no expected effect on breeding migratory songbirds or waterbirds as construction activities would occur outside of the nesting season.

However, construction disturbance, especially blasting, could result in minor to moderate adverse effects to raptors and eagles as construction activities may overlap with their primary nesting season. Shockwaves and vibrations from blasting activities could cause physical damage to nearby nests, potentially dislodging them from trees or structures. Additionally, the disturbance caused by blasting could lead to abandonment of nests, leaving eggs or chicks vulnerable to predation or exposure. For details on proposed measures and BMPs to minimize and mitigate blasting impacts, refer to Section 8 below and the Noise and Vibration Technical Report.

As the PBC system in the Project Area is piped, a linear loss of surface water and some of the vegetation associated with the open canal would occur. The removal of this water source could alter the distribution patterns of wildlife within the Project Area. However, the PBC is not naturally occurring and only supports those species that are able to accommodate a level of human interaction. Additionally, the Modernization Alternative would be implemented over time, allowing ungulates and other terrestrial wildlife ample time to adjust to the conditions and find new water sources. Overall, construction activities would cause negligible short-term effects on wildlife due to increased human presence.

Aquatic Species

The Modernization Alternative would have no construction impacts on aquatic species within the Deschutes River or other waterbodies associated with District operations because no activities would

take place within or adjacent to these waters. No construction impacts to fish would be expected, as ODFW-compliant fish screens prevent fish from entering the PBC system.

Construction impacts to non-fish aquatic species such as toads, frogs, and salamanders within the PBC would include loss of habitat, noise impacts from construction activities and equipment, and potential death or injury from construction activities. However, the current habitat is low quality, available only at times when the canals carry water, and is not considered critical to the long-term survival of these species (Oregon Watershed Plans 2020).

Wetlands

Construction impacts to adjacent wetlands could include sedimentation from stormwater runoff and accidental fuel spills. Implementation of BMPs such as silt fencing would be used to minimize effects.

Artificial fringe wetlands that may be present receive hydrology directly from irrigation flows and are likely less than 1 acre; they are likely not jurisdictional. Therefore, implementation of this alternative would not result in impacts to artificial fringe wetlands.

7.2.1.2 Deschutes County/North Bend Option

No Modernization within this Segment (No Piping)

No impacts to vegetation, wildlife, or aquatic species would be expected in this segment under this option as no construction would occur.

Pilot Butte Canal Option

Construction-phase impacts to vegetation, wildlife, fish and aquatic species, and wetlands would be the same under this option as those described in Section 7.2.1 for the Modernization Alternative with full piping.

NE 18th Street Option

Vegetation

Construction of this option would temporarily disturb surrounding vegetation. However, the majority of this alignment runs along existing paved areas where vegetation would not be disturbed. After construction, there would be a net increase in herbaceous vegetation because the area above the pipe would be recontoured with topsoil and vegetated with a seed mix of NRCS-approved grasses and forbs. COID would implement BMPs to minimize the spread of noxious weeds.

Wildlife

Construction impacts to wildlife under this option could include noise disturbance due to heavy equipment, habitat removal due to cutting of trees and other vegetation removal, or injury due to collision with construction equipment or habitat removal. However, the PBC is located in both urban and agricultural settings where wildlife are accustomed to noise and these disturbances are anticipated to be minor. Additionally, construction of this option would occur along existing paved areas where wildlife are not anticipated to be present.

Potential blasting impacts to birds, specifically raptors and eagles, would be the same under this option as those described in Section 7.2.1 for the Modernization Alternative with full piping.

Aquatic Species

No construction impacts to fish would be expected as ODFW-compliant fish screens prevent fish from entering the PBC system.

No construction impacts to aquatic species would be expected as this alignment is located along a paved road where suitable habitat is not present.

Wetlands

Jurisdictional wetlands are not anticipated to be present in this alignment. Artificial fringe wetlands that may be present receive hydrology directly from irrigation flows and are likely less than 1 acre; they are likely not jurisdictional. Therefore, implementation of this option would not result in impacts to wetland resources.

Old Deschutes Road Option

Vegetation

A substantial portion of this alignment runs along existing paved areas where vegetation would not be disturbed; however, in currently undeveloped areas of the proposed alignment, excavation, pipe construction, and construction equipment access and operation would temporarily disturb vegetation. After construction, the area above the pipe would be recontoured with topsoil and vegetated with an NRCS-approved seed mix of grasses and forbs. BMPs would be used to reduce the amount of potential adverse impacts such as the spread of noxious weeds. Pipe installation would avoid tree removal to the extent practicable; however, where unavoidable, trees removed would generally be replaced. Permanent tree removal would result where tree roots could potentially damage the pipe. For mitigation details, including BMPs, see Section 8 below.

Wildlife

Construction impacts to wildlife under this option could include noise disturbance due to heavy equipment, habitat removal due to cutting of trees and other vegetation removal, or injury due to collision with construction equipment or habitat removal. However, the PBC is located in an urban setting where wildlife are accustomed to noise and these disturbances are anticipated to be minor. Overall, construction activities would cause negligible short-term effects on wildlife due to increased human presence.

Potential blasting impacts to birds, specifically raptors and eagles, would be the same under this option as those described in Section 7.2.1 for the Modernization Alternative with full piping.

Aquatic Species

No construction impacts to fish would be expected as ODFW-compliant fish screens prevent fish from entering the PBC system.

No construction impacts to aquatic species would be expected as this alignment is located along a paved road where suitable habitat is not present.

Wetlands

Wetlands that may be present along this alignment likely consist of artificial fringe wetlands that receive hydrology directly from irrigation flows and are less than 1 acre. These wetlands are likely not

jurisdictional. Therefore, implementation of this option would not be expected to result in impacts to jurisdictional wetlands.

7.2.1.3 City of Redmond Option

No Modernization within this Segment (No Piping)

No impacts to vegetation, wildlife, or aquatic species would be expected in this segment under this option as no construction would occur.

Pilot Butte Canal Alignment (Existing Canal Route)

Construction-phase impacts to vegetation, wildlife, fish and aquatic species, and wetlands would be the same under this option as those described in Section 7.2.1 for the Modernization Alternative with full piping.

Piping to the East in the Watermaster's Access Road

Vegetation

Construction impacts to vegetation would include tree removal and temporary disturbance to herbaceous vegetation and shrubs from pipe construction activities and operation of construction vehicles and equipment. After construction, the area above the pipe would be recontoured with topsoil and vegetated with an NRCS-approved seed mix of grasses and forbs. BMPs would be used to reduce potential adverse impacts such as the spread of noxious weeds. Tree protection would also be installed to prevent tree damage to the greatest extent feasible. However, tree removal would likely not be completely avoidable because of the close proximity of this alignment to existing trees within adjacent business landscaping. Trees would generally be replaced on-site or relocated if feasible. Where tree replacement or relocation is not feasible due to potential for tree roots to damage the pipe, COID would coordinate with the City of Redmond to determine the appropriate course of mitigation action per City of Redmond Zoning Code. For mitigation details, including BMPs, see Section 8 below.

Wildlife

Construction impacts to wildlife under this option could include noise disturbance due to construction activities and equipment. However, the PBC is located in an urban setting where wildlife are accustomed to noise and these disturbances are anticipated to be minor. Overall, construction activities would cause negligible short-term effects on wildlife due to increased human presence.

Potential blasting impacts to birds, specifically raptors and eagles, would be the same under this option as those described in Section 7.2.1 for the Modernization Alternative with full piping.

Aquatic Species

Construction of this option would have no impact on fish as applicable habitat is not present. However, construction activities could kill or injure common aquatic species, and following implementation, habitat that is currently available to common aquatic species would be lost.

Wetlands

Wetlands are not anticipated to be present in this alignment. Artificial fringe wetlands may be present. These wetlands typically receive hydrology directly from irrigation flows and are likely less than 1 acre.

As a result, they are likely not jurisdictional. Therefore, implementation of this alternative is not expected to result in impacts to jurisdictional wetlands.

Piping to the West within North Canal Boulevard

Vegetation

Construction of this option would occur primarily along existing paved areas where vegetation would not be disturbed. Construction impacts where vegetation is present would include temporary disturbance from construction activities and equipment. After construction, areas where vegetation was disturbed would be recontoured with topsoil and vegetated with a seed mix of NRCS-approved grasses and forbs. BMPs would be used to reduce the amount of potential adverse impacts such as the spread of noxious weeds. For mitigation details, including BMPs, see Section 8 below.

Wildlife

Construction of this option would occur primarily along existing paved areas where wildlife would not be disturbed. Construction impacts to wildlife under this option could include noise disturbance due to construction activities and equipment. However, the PBC is located in an urban setting where wildlife are accustomed to noise and these disturbances are anticipated to be minor. Additionally, construction of this option runs along existing paved areas where wildlife are not anticipated to be present.

Potential blasting impacts to birds, specifically raptors and eagles, would be the same under this option as those described in Section 7.2.1 for the Modernization Alternative with full piping.

Aquatic Species

Construction of this option would have no impact to fish or aquatic species as suitable habitat is not present.

Wetlands

Wetlands are not anticipated to be present along this alignment. Artificial fringe wetlands may be present. These wetlands typically receive hydrology directly from irrigation flows and are likely less than 1 acre. As a result, they are likely not jurisdictional. Therefore, implementation of this alternative is not expected to result in impacts to jurisdictional wetlands.

7.2.2 Potential Off-Site Staging Areas

The construction contractor may use one or more off-site staging areas outside the Study Area to store or assemble materials that would then be transported by truck to the construction site. Off-site staging could occur with any of the alignment options. Whether, where, and how to use such sites would be the choice of the contractor; therefore, the actual site or sites cannot be known at this time. Given this uncertainty, detailed analysis of impacts is not possible at this time. It is assumed that because of regulatory and time constraints on the contractor, any site they choose would need to be already developed with road access. It is also assumed that the contractor would be responsible for relevant permitting or mitigation that could be required for use of a chosen site. The EIS identifies the types of impacts that could occur from off-site staging, based on the above assumptions. This analysis is not intended to “clear” any specific site, but rather to ensure disclosure of the general types of impacts.

The following types of impacts could occur from off-site staging:

- Additional construction noise would be generated by equipment at the staging/stockpiling areas and along material haul routes, adding to the total project noise levels.
- Mobilization of soils, sediments, and contaminants in stormwater runoff from the site.

If a contractor chooses to use an off-site staging area, the following local, state, and federal regulations could apply. The time during the day that construction staging can occur is between the hours of 7 a.m. and 10 p.m. Work outside of that time window would require a noise variance from either the City of Bend, the City of Redmond, or Deschutes County. Additionally, use of an undeveloped site could trigger the requirement for National Pollutant Discharge Elimination System compliance; a 1200-C construction stormwater permit from the Oregon Department of Environmental Quality would be required.

7.2.3 Cumulative Effects

The combined, incremental effects of past, present, and reasonably foreseeable actions are referred to as cumulative effects. While they may be insignificant by themselves, cumulative effects accumulate over time from one or more sources and can result in the degradation of important resources. The PBC piping project could potentially contribute to cumulative effects on biological resources when considered in combination with other past, present, and reasonably foreseeable actions in the Upper Deschutes Basin.

7.2.3.1 No Action Alternative

Under the No Action Alternative, no federal funding would be forthcoming to support the Project and modernization of the PBC system would not take place. No direct effects on vegetation, wildlife, or aquatic species would result from the Project, and existing conditions would remain unchanged. The project would, therefore, not contribute to cumulative impacts to vegetation, wildlife, or aquatic species.

7.2.3.2 Modernization Alternative (Full Piping)

Vegetation

Agricultural activities, livestock grazing, vegetation control along roads, and urban and suburban development are responsible for most of the past and ongoing effects on vegetation in the Study Area and in the region. Livestock grazing can introduce and spread weed species, degrade native vegetation communities, and trample riparian and wetland areas. In addition, vegetation control activities generally include herbicide applications to control vegetation and noxious weeds, and the mechanical cutting of vegetation. The amount of vegetation that would be affected by the proposed action is small compared to the area affected by past and ongoing agricultural activities, livestock grazing, vegetation control along roads, and other utility corridors in the area. In addition, these past actions are not expected to change measurably from current conditions, resulting in minor cumulative effects.

Wildlife

Agricultural, urban, and suburban development have affected wildlife and wildlife habitat in the Study Area and project vicinity since the late 1800s. Agricultural activities have substantially altered the habitat in some parts of the project vicinity and the surrounding region by removing native vegetation communities and diverting streamflow. Livestock grazing occurs in much of the region around the

Project Area and can result in the introduction and spread of weed species, the degradation of native habitat, and trampling of riparian and wetland areas. Some native habitats have been replaced with disturbance-tolerant or introduced species assemblages that may support different wildlife than previously existed. These ongoing activities would continue to affect wildlife and wildlife habitat in the Project Area.

Raptor and eagle nesting sites have the potential to occur within or near the Project Area. Implementation of the proposed action may overlap with the primary nesting season for raptors and eagles. Shockwaves and vibrations from construction activities, specifically blasting, could cause physical damage to nearby nests, potentially dislodging them from trees or structures. Additionally, the disturbance caused by blasting and similar activities could lead to abandonment of nests, leaving eggs or chicks vulnerable to predation or exposure. The cumulative effects on raptors and eagles from implementation of the proposed action would range from negligible to minor and adverse.

Some wildlife currently use the PBC as a water source. Implementation of the proposed action would cause wildlife to find other water sources, as they did prior to installation of the canals, but would also create connected habitat corridors through which wildlife could travel. Since effects of the proposed action on wildlife would happen incrementally over the several years needed to complete the Project, animals would be able to adapt. Furthermore, because other past, present, and reasonably foreseeable future actions affect wildlife across a broad geographic area in the Deschutes Basin, the cumulative effects on wildlife from implementation of the proposed action would be minor.

In addition, vegetation control activities, including herbicide applications to control noxious weeds and the mechanical cutting of vegetation, are ongoing actions that contribute to wildlife habitat changes. In conjunction with past and ongoing agricultural activities, livestock grazing, vegetation control, and urban and suburban development in the area, the proposed action would have a negligible cumulative effect on wildlife habitat available.

Aquatic Species

Past actions, including road construction, road maintenance, and urban and suburban development projects, would have minor effects on fish in combination with the proposed action. The potential effects from these past projects in COID and the Deschutes Basin, such as sediment entering waterbodies or aquatic habitat disturbance, would be temporary and likely complete before construction of the proposed action.

Because the COID irrigation diversions are screened and the conveyance systems do not provide adequate habitat for fish and aquatic species, implementation of the Modernization Alternative would not have a direct effect on fish and aquatic species within the COID irrigation infrastructure. Irrigation diversions and reservoir operations are responsible for most of the past and ongoing direct and indirect effects related to water availability and seasonality on fish communities and associated riverine habitat in the area affected by District operations.

Ongoing land use activities in the Project Area are not expected to change from current conditions. Future land development projects may cause indirect effects on fish, such as sediment inputs, mobilization of contaminants in stormwater runoff from new impervious surfaces, or aquatic habitat disturbance, and could potentially affect waters within the same watershed as the proposed action.

Ongoing and future water management activities would be expected to improve aquatic habitat conditions. These actions include the installation of other irrigation piping projects in the Upper

Deschutes Basin and the phase-in to full implementation of the DBHCP. With phase-in of the DBHCP, to protect threatened aquatic species, irrigation districts in the Upper Deschutes Basin will be modifying their operations generally to leave more flow in-stream, as well as seasonally to create higher overall winter streamflows and lower overall summer streamflows. This will leave less water available to support for agricultural production. The cumulative water savings made available by modernization of other districts' conveyance systems is expected to conserve substantial amounts of water, allowing more reliable water delivery to agricultural producers while complying with the requirements of the DBHCP conservation measures. The water that would be saved by modernizing the COID conveyance system would have an additive effect on the increased water delivery reliability for agricultural producers but would not contribute to cumulative effects on aquatic species or their habitats within the Deschutes River system. As a result, implementation of the proposed action, when combined with other future actions, is anticipated to have a moderate, beneficial cumulative effect on fish, aquatic species, and available habitat for these species. The Modernization Alternative would not contribute adversely or beneficially to overall cumulative effects. See the Water Resources Technical Report for additional detail on the streamflow conservation requirements of the DBHCP and the water savings effects of the proposed action in combination with other past, ongoing, and reasonably foreseeable irrigation modernization projects in the Upper Deschutes Basin.

Wetlands

Past actions that may have affected wetlands, riparian areas, and floodplains consist of the original construction of the irrigation canals as well as agricultural activities, livestock grazing, vegetation control, and development. Seepage from the PBC has contributed to localized vegetation and three freshwater emergent wetlands (USFWS n.d.d) within or adjacent to the Project Area. The proposed project would reduce the amount of water available to vegetation and these potential wetland features during the irrigation season. These sites, however, are expected to be non-jurisdictional. Reasonably foreseeable future actions in the Project Area that could affect wetland vegetation along irrigation canals include agricultural activities, livestock grazing, vegetation control along roads and utility corridors, and urban and suburban development.

The ongoing implementation and the future full phase-in of the DBHCP will require increased streamflow in the upper and middle Deschutes River during the non-irrigation season. Water savings from the proposed action would enable more reliable water delivery to irrigators in light of the DBHCP requirements for conservation of in-stream flow. Increased streamflow resulting from the DBHCP is expected to have beneficial effects on riparian vegetation and Oregon spotted frog habitat in the upper Deschutes River and negligible effects on riparian vegetation and Oregon spotted frog habitat in Wickiup Reservoir. Other ongoing and anticipated future irrigation modernization actions (see the Aquatic Species discussion above), in combination with implementation of the DBHCP, are anticipated to contribute to increased streamflow and associated beneficial effects on riparian vegetation in the Deschutes River system. The Modernization Alternative would contribute no adverse or beneficial effects to the overall cumulative effects on wetlands. Refer to the Water Resources Technical Report for additional detail on the streamflow conservation requirements of the DBHCP and the water savings effects of the proposed action in combination with other irrigation modernization projects.

The cumulative effect of the proposed action and other past, present, and reasonably foreseeable future projects on wetlands and opportunistic hydrophytic vegetation is expected to be minor.

7.3 Compliance with Laws, Regulations, and Standards

The Project would comply with all federal, state, and local laws and regulations that would be triggered by the Project's construction activities. Permits would be applied for and acquired before Project construction begins. The permits identified below would be required for the Project regardless of the alignment option.

7.3.1 Federal

7.3.1.1 Endangered Species Act

Federal permits that would be required for the Project include the Section 7 Consultation required for potential impacts to ESA-listed species. A biological assessment would be prepared for consultation with USFWS. It is anticipated that the project may affect ESA-listed species - notably Oregon spotted frog - but would be not likely to adversely affect ESA-listed species or designated critical habitat, and therefore, a letter of concurrence would be requested from USFWS. Consultation with NOAA Fisheries is not likely to be required for MCR steelhead, because the closest extent of potential presence of this species is more than 32 miles south of the PBC diversion. Any hydrological effects within the Deschutes River resulting from the Project would be below the level of biological detection for MCR steelhead at such a distance. A No Effect determination is anticipated to be made for this species.

7.3.1.2 Bald and Golden Eagle Protection Act

The Project Take of bald or golden eagles is not anticipated by since no nests would be disturbed and construction would occur outside of the nesting season. Should the potential for take of these species occur, compliance with the BGEPA would be required under the jurisdiction of USFWS.

7.3.1.3 Magnuson-Stevens Fishery Conservation and Management Act

As the proposed project would not affect EFH, consultation under the Magnuson-Stevens Act would not be required.

7.3.1.4 Migratory Bird Treaty Act

Per 50 CFR 21.10, compliance with the MBTA under the jurisdiction of USFWS is required for the potential take of all protected migratory bird species. It is anticipated that construction timing could avoid the primary nesting season for migratory birds of concern, but it would potentially overlap with the primary nesting season for raptors. Therefore, compliance with MBTA would be required under the jurisdiction of USFWS.

7.3.1.5 Section 401 Water Quality Certification

The proposed project would align with the intent of Section 401 because it would ultimately have beneficial effects on water quality. Because work associated with the proposed action would not take place within the Deschutes River or other jurisdictional waters, and construction of the Modernization Alternative would be undertaken during the non-irrigation season when no water is flowing through the PBC, it would not directly affect wetlands or waters of the United States or trigger requirements for federal clean water permits.

7.3.1.6 Section 404 for Permitting Discharges or Dredge or Fill Material

Under Section 404(f)(1)(c) of the CWA, discharges of dredged or fill material associated with construction or maintenance of irrigation ditches or the maintenance (but not construction) of drainage ditches are not prohibited by, or otherwise subject to, regulation under Section 404. Discharges of dredged or fill material associated with siphons, pumps, headgates, wingwalls, weirs, diversion structures, and such other facilities as are appurtenant to and functionally related to irrigation ditches and included in the exemption for irrigation ditches. Under 33 CFR 323.4(a)(1)(i)(c)(C)(1)(i), “[c]onstruction and maintenance of upland (dryland) facilities such as ditching and tiling, incidental to the planting, cultivating, protecting, or harvesting of crops, involve no discharge of dredged or fill material into Waters of the United States, and as such never require a Section 404 permit.” The construction and maintenance of irrigation ditches and maintenance of drainage ditches may require the construction and/or maintenance of a farm road. Subsection 404(c)(1)(E) exemption for discharges of dredged or fill material associated with the construction or maintenance of farm roads applies where such related farm roads are constructed and maintained in accordance with BMPs. However, in 33 CFR 323.4(a)(6) and 40 CFR 232.3(c)(6), there must be assurance that flow and circulation patterns and chemical and biological characteristics of Waters of the United States are not impaired, that the reach of the Waters of the United States is not reduced, and that any adverse effect on the aquatic environment would be otherwise minimized.

Should the U.S. Army Corps of Engineers (USACE) determine that the project has potential for a significant impact to a Water of the United States, an individual permit would be required. Individual permits are reviewed by USACE, which evaluates applications under a public interest review, as well as the environmental criteria set forth in CWA Section 404(b)(1) Guidelines, regulations promulgated by the EPA.

Should USACE determine that the Project would only have minimal adverse effects, a general permit would be required. General permits are issued on a nationwide, regional, or state basis for particular categories of activities. The general permit process eliminates individual review and allows certain activities to process with little or no delay, provided that the general or specific conditions for the general permit are met.

7.3.2 State

7.3.2.1 Oregon Endangered Species Act

Compliance with the Oregon Endangered Species Act under the jurisdiction of ODFW and ODA is required for potential impacts to those species with a status of threatened or endangered in Oregon.

7.3.2.2 Oregon Fish Passage Law

No fish are present within the existing PBC, and no additional consultation or permitting is required for compliance with the Oregon Fish Passage laws.

7.3.2.3 Statewide Biological Resource Planning Goals

The Project would comply with the natural resources focus of Oregon Statewide Planning Goal 5, Natural Resources, Scenic and Historic Area, and Open Spaces. The Project would not permanently reduce fish and wildlife areas and habitats.

7.3.2.4 ORS 196.795-990, Oregon Removal-Fill Law

DSL implements the Removal-Fill Law (ORS 196.800-990) that regulates the removal or fill of material in wetlands or waterways, requiring any person who plans to “remove or fill” material within “waters of the state” to obtain a permit from DSL. Consultation with DSL to obtain a permit would be necessary.

7.3.3 Local

7.3.3.1 Deschutes County

Comprehensive Plan

The Project is consistent with the Open Spaces, Scenic Views and Sites goals and policies of the *Deschutes County Comprehensive Plan*. No portion of the PBC falls within inventoried Areas of Special Concern. Existing and future trails along the PBC alignment support the policy to create a comprehensive system of connected open spaces.

County Code

The Project is consistent with the County Zoning goals and policies of the Deschutes County Code. Per Chapters 18.88, 18.89, and 18.90, COID should coordinate with the County to ensure conservation of important wildlife areas, greater sage-grouse areas, and sensitive bird and mammal habitats, respectively. No portion of the PBC alignment currently falls within the protected areas noted above; however, it should be noted that these designated areas are subject to change and would need to be reconfirmed at the time of construction.

7.3.3.2 City of Bend

The Project is consistent with the Natural Features and Open Space goals and policies of the *Bend Comprehensive Plan*. The plan identifies irrigation canals as an example of “corridor or linear” open space that is found within the city. While piping of the PBC would remove the canal as a linear open space, the land above the piped canal alignment would remain a vegetated, undeveloped open space feature. Per Policy 2-10, the City would coordinate with COID to protect open space within the city. Per Policy 2-19, the City would coordinate with COID to protect designated wildlife areas within the city.

7.3.3.3 City of Redmond

The Project would comply with the *Redmond Comprehensive Plan* Open Spaces, Scenic and Historic Areas, and Natural Resources goals, policies, and principles. The Project is not currently located within Regionally Significant Fish and Wildlife Habitats. Per Policy 5-2-5, COID should coordinate with the City of Redmond to encourage development practices that are ecologically responsible and benefit local ecosystems.

7.4 Conclusion

The PBC is in proximity or adjacent to vegetation, wildlife, aquatic species, and wetlands in the Study Area. The canal acts as a seasonal water source for all of the above biological resources. Piping the canal would remove this water source and create long-term negligible to minor effects.

Long-term negligible impacts to aquatic species may occur as a result of piping the canal due to vegetation removal and habitat loss as landscapes revert to uplands.

Temporary adverse impacts to vegetation, terrestrial wildlife, and non-jurisdictional wetlands would occur due to ground disturbance during construction. Furthermore, temporary minor to moderate adverse impacts to nesting raptors and eagles could occur due to construction activities such as blasting. Impacts to nesting raptors and eagles would be minimized by adherence to USFWS management protocols and prescribed buffer distances, along with noise mitigation BMPs at blasting sites (see the Noise and Vibration Technical Report). Temporary negligible effects on terrestrial wildlife and amphibians would be caused by physical and noise impacts from nearby construction activities and equipment. Additional temporary negligible effects on vegetation and non-jurisdictional wetlands would be caused by noise impacts from nearby construction activities and equipment.

Long-term beneficial impacts to vegetation and terrestrial wildlife would occur as a result of piping the canal due to noxious weed management and increased habitat connectivity.

Modernization of the PBC would have no effect on jurisdictional wetlands because no jurisdictional wetlands were identified within the Project Area.

8. MITIGATION MEASURES

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

8.1 Construction

- Construction limits would be clearly flagged on-site to avoid unnecessary plant loss or ground disturbance.
- Temporary travel routes and construction staging areas would be selected to minimize effects on vegetation and avoid mature trees to the extent practicable.
- Construction would occur outside of USFWS-approved buffer distances for migratory birds and bald and golden eagle nests. If construction within the recommended buffer distance is not possible, it would be scheduled take place outside of the nesting season.
- Construction is anticipated to take place during February and March, outside of the primary nesting period for migratory birds of concern (April 15 through July 31). For occasions where project construction overlaps with the primary nesting period for raptors and eagles (February 15 through July 31), surveys would be conducted out to a radius of at least 2 miles of the construction site, per USFWS eagle nest survey protocol (USFWS n.d.f). Should an active nest be found, construction would not proceed prior to consultation with a local USFWS biologist to determine next steps.
- Blasting activities would adhere to management prescriptions in the USFWS National Bald Eagle Management Guidelines (USFWS 2007). These would include but may not be limited to avoiding blasting within a minimum of 0.5 mile of active nests, as well as avoiding blasting within 0.5 mile (or 1 mile in open areas) of communal roosts when eagles are congregating, without prior

coordination with USFWS and ODFW. See the Noise and Vibration Technical Report for additional discussion of BMPs and mitigation measures for blasting noise.

- In appropriate cases and under consultation with ODFW, ramps would be placed in open pipeline trenches during construction to avoid the potential for wildlife to become trapped overnight.
- After construction, the Project Area would be recontoured and planted with an NRCS approved seed mix. Planting would be conducted in consultation with NRCS.
- Construction would occur during the non-irrigation season so that there is no water within the canal.
- Silt fencing would be used to minimize effects to waterbodies from stormwater runoff to s.

8.2 Operations and maintenance

- Vegetation within the right-of-way and easements would be maintained according to the COID vegetation management program and NRCS Oregon and Washington's Guide for Conservation Seedlings and Plantings (Oregon Watershed Plans 2020).
- Weeds would be controlled within the right-of-way using hand pulling during the first year after reseeding, and a combination of hand pulling and spot spraying in the second year if weeds become problematic. Thereafter, weeds would be managed per county standards (Oregon Watershed Plans 2018).
- Water saved from the Piping Alternative would be protected as storage for winter release from Wickiup Reservoir, and would be used to provide DBHCP-mandated minimum in-stream flows in the Deschutes River during the non-irrigation season (Oregon Watershed Plans 2020).

9. CONTACTS AND COORDINATION

No individuals or organizations were contacted as part of the preparation of this technical report.

10. PREPARERS

Name	Professional Affiliation	Education	Years of Experience
Chloe Kott	Parametrix	EP Environmental Professional BA Fish, Wildlife, and Conservation Biology	6
Taya K. MacLean, PWS	Parametrix	BS Forestry and Natural Resources Management MS Biology	23
Jason Medema	Parametrix	BA International Affairs MS Environmental Studies	19

11. REFERENCES

- City of Bend. 2023. Bend Comprehensive Plan.
Available at <<https://bend.municipal.codes/CompPlan>>. Accessed August 2023.
- City of Bend. 2023. City of Bend Community Development Data Explorer. Available at
<<https://bendoregon.maps.arcgis.com/apps/webappviewer/index.html?id=e9ee48099785425f82f23bf92473b0de>>. Accessed August 2023.
- City of Redmond. 2020. Redmond Comprehensive Plan. Available at
<<https://www.redmondoregon.gov/home/showpublisheddocument/22576/637528649112970000>>. Accessed August 2023.
- City of Redmond. 2023. City of Redmond Web Map. Available at
<<https://redmondoregon.maps.arcgis.com/apps/webappviewer/index.html?id=e48ab340ca2c4c748acca76122155b41>>. Accessed August 2023.
- COID (Central Oregon Irrigation District). 2008. Development Handbook. Available at
<<https://coid.org/wp-content/uploads/2016/09/DEVELOPERHANDBOOK-10-15-08.pdf>>. Accessed October 2023.
- Deschutes County. 2011. Deschutes County Comprehensive Plan. Available at
<<https://www.deschutes.org/cd/webform/planning-zoning>>. Accessed August 2023.
- Deschutes County. 2022. Deschutes County Weed List. Available at
<<https://www.deschutes.org/road/page/noxious-weed-program>>. Accessed August 2023.
- Deschutes County. 2023. Deschutes County Data Portal Zoning Wildlife Area. Available at
<<https://data.deschutes.org/datasets/deschutes::zoning-wildlife-area-1/explore?location=44.057176%2C-121.298725%2C12.47>>. Accessed August 2023.
- Deschutes County Community Development. n.d. Deschutes County Wildlife Inventory Update. Available at
<<https://storymaps.arcgis.com/stories/bf3fc37e84b04670aa9941fa3eaa7d22>>. Accessed August 2023.
- DSL (Oregon Department of State Lands). 2023. 2023 Essential Salmonid Habitat Map. Available at
<<https://maps.dsl.state.or.us/esh/>>. Accessed August 2023.
- Forest Science Labs. 2023. Peck's Milkvetch ACEC. Available at
<https://www.fsl.orst.edu/rna/sites/Pecks_Milkvetch.html>. Accessed August 2023.
- Google Earth 7.3. 2023. 44°18'16.93"N, -121° 9'23.45"W, elevation 914M. Aerial Imagery.
<<http://www.google.com/earth/index.html>>. Accessed August 2023.
- International Union for Conservation of Nature (IUCN). 2023. Available at
<<https://www.iucnredlist.org/>>. Accessed August 2023.

NOAA Fisheries (National Oceanic and Atmospheric Administration National Marine Fisheries Service). n.d.a. Endangered Species Conservation: ESA Implementation. Available at <https://www.fisheries.noaa.gov/topic/endangered-species-conservation/endangered-species-act-implementation>>. Accessed August 2023.

NOAA Fisheries. n.d.b. Essential Fish Habitat Mapper. Available at https://www.habitat.noaa.gov/apps/efhmapper/?page=page_4&views=view_31>. Accessed August 2023.

NOAA Fisheries. n.d.c. Protected Resources App. Available at <https://www.webapps.nwfsc.noaa.gov/portal/apps/webappviewer/index.html?id=7514c715b8594944a6e468dd25aaacc9>>. Accessed August 2023.

National Park Service. 2020. Townsend's Big-eared Bat. Available at <https://www.nps.gov/chis/learn/nature/townsend-bats.htm#:~:text=The%20Townsend's%20big%20eared%20bat%20occurs%20throughout%20the%20west%20and,central%20and%20eastern%20United%20States>>. Accessed August 2023.

NRCS, USDA (Natural Resources Conservation Service, United States Department of Agriculture). 2020. Smith Rock-King Way Infrastructure Modernization Project. Available at https://img1.wsimg.com/blobby/go/4c8b915d-c9c0-4a10-86d6-3ac6eb749f65/downloads/COID%20Final%20Plan%20EA%207.8.2020_compress.pdf?ver=1608009561477>. Accessed October 8, 2023.

NRCS, USDA. n.d. Web Soil Survey. Available at <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>>. Accessed August 2023.

ORBIC (Oregon Biodiversity Information Center). 2023. Rare, threatened and endangered species in the vicinity of site. Institute for Natural Resources, Portland State University, Portland, Oregon. Generated August 10, 2023.

ODA. 2018. Oregon Listed and Candidate Plants Database. Available at <https://data.oregon.gov/Natural-Resources/Oregon-listed-and-candidate-plants-complete-list/8s3k-ygh2>>. Accessed August 2023.

ODA. 2022. Noxious Weed Policy and Classification. Noxious Weed Control Program. Available at <https://www.oregon.gov/oda/programs/Weeds/OregonNoxiousWeeds/Pages/Law.aspx>>. Accessed August 2023.

ODA. n.d. WeedMapper. Available at <https://www.oregon.gov/oda/programs/weeds/pages/weedmapper.aspx>>. Accessed August 2023.

ODA. 2023. Oregon listed plants by county. Available at <https://www.oregon.gov/ODA/programs/PlantConservation/Pages/ListedPlants.aspx>>. Accessed August 2023.

ODFW. n.d.a. Centralized Oregon Mapping Products and Analysis Support System (Compass). Available at < <https://compass.dfw.state.or.us/visualize/#x=-121.58&y=43.76&z=7&logo=true&basemap=ESRI+Satellite&tab=data&print=false>>. Accessed January 2024.

ODFW. n.d.b. Oregon Fish Habitat Distribution and Barriers. Available at <https://nrmp.dfw.state.or.us/FHD_FPB_Viewer/index.html>. Accessed August 2023.

ODFW. n.d.c. The Oregon Conservation Strategy. Available at <<https://www.oregonconservationstrategy.org/overview/>>. Accessed January 2024.

ODFW. 2021. Threatened, Endangered, and Candidate Fish and Wildlife Species. Available at <https://www.dfw.state.or.us/wildlife/diversity/species/docs/Threatened_and_Endangered_Species.pdf>. Accessed August 2023.

ODFW. 2023a. News Releases: Spearfishing and bait use for smallmouth bass temporarily allowed on Coquille River system. Available at <https://www.dfw.state.or.us/news/2023/06_Jun/060123b.asp>. Accessed August 2023.

ODFW. 2023b. Fall Chinook in the Deschutes River. Available at <https://www.dfw.state.or.us/fish/The_Dalles/fall_chinook_deschutes.asp>. Accessed November 16, 2023.

Oregon Department of Forestry (ODF). n.d. Forest Practices Act. Available at <<https://www.oregon.gov/odf/working/Pages/fpa.aspx>>. Accessed August 2023.

Oregon Explorer 2023. Chinook salmon in the Deschutes Basin. Available at <<https://oregonexplorer.info/content/chinook-salmon-the-deschutes-basin?topic=206&ptopic=179>>. Accessed November 16, 2023.

Oregon Flora. 2023. Taxa Search. Available at <<https://oregonflora.org/>>. Accessed August 2023.

Oregon Watershed Plans. 2018. Tumalo Irrigation District. Available at <<https://oregonwatershedplans.org/tumalo-id>>. Accessed August 2023.

Oregon Watershed Plans. 2020. Central Oregon Irrigation District. Available at <<https://oregonwatershedplans.org/central-oregon-id>>. Accessed August 2023.

StreamNet. n.d. StreamNet Mapper. Available at <<https://www.streamnet.org/home/data-maps/sn-mapper/>>. Accessed August 2023.

USFS. 2023. Native Salmon & Steelhead. Available at <https://www.fs.usda.gov/detail/r6/workingtogether/contracting?cid=fsbdev2_027105>. Accessed August 2023.

USFWS. n.d.a. Critical Habitat for Threatened and Endangered Species. Available at <<http://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77>>. Accessed August 2023.

USFWS. n.d.b. Environmental Conservation Online System, Threatened and Endangered Species. Available at <<https://ecos.fws.gov/ecp/>>. Accessed August 2023.

USFWS. n.d.c. IPaC (Information for Planning and Consultation) Resource list. Generated August 2, 2023. Available at <<https://www.fws.gov/oregonfwo/articles.cfm?id=149489416>>. Accessed August 2023.

USFWS. n.d.d. National Wetlands Inventory. Available at <<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>>. Accessed August 2023.

USFWS. n.d.e. Species Search. Available at <<https://www.fws.gov/species>>. Accessed August 2023.

USFWS. n.d.f. Updated Eagle Nest Survey Protocol. Available at <<https://www.fws.gov/sites/default/files/documents/eagle-nest-survey-guidance-updated-protocol.pdf>>. Accessed March 2024.

USFWS. 2007. National Bald Eagle Management Guidelines. May 2007. Available at <https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines_0.pdf>. Accessed March 2024.

USFWS. 2021a. Birds of Conservation Concern 2021. Available at <<https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf>> Accessed August 2023.

USFWS. 2021b. Deschutes Basin HCP: Conservation Measures and Monitoring Requirements. Summary of Measures. Available at <<https://www.fws.gov/sites/default/files/documents/USFWS%20HCP%20Conservation%20Measure%202021.pdf>>. Accessed September 3, 2023.

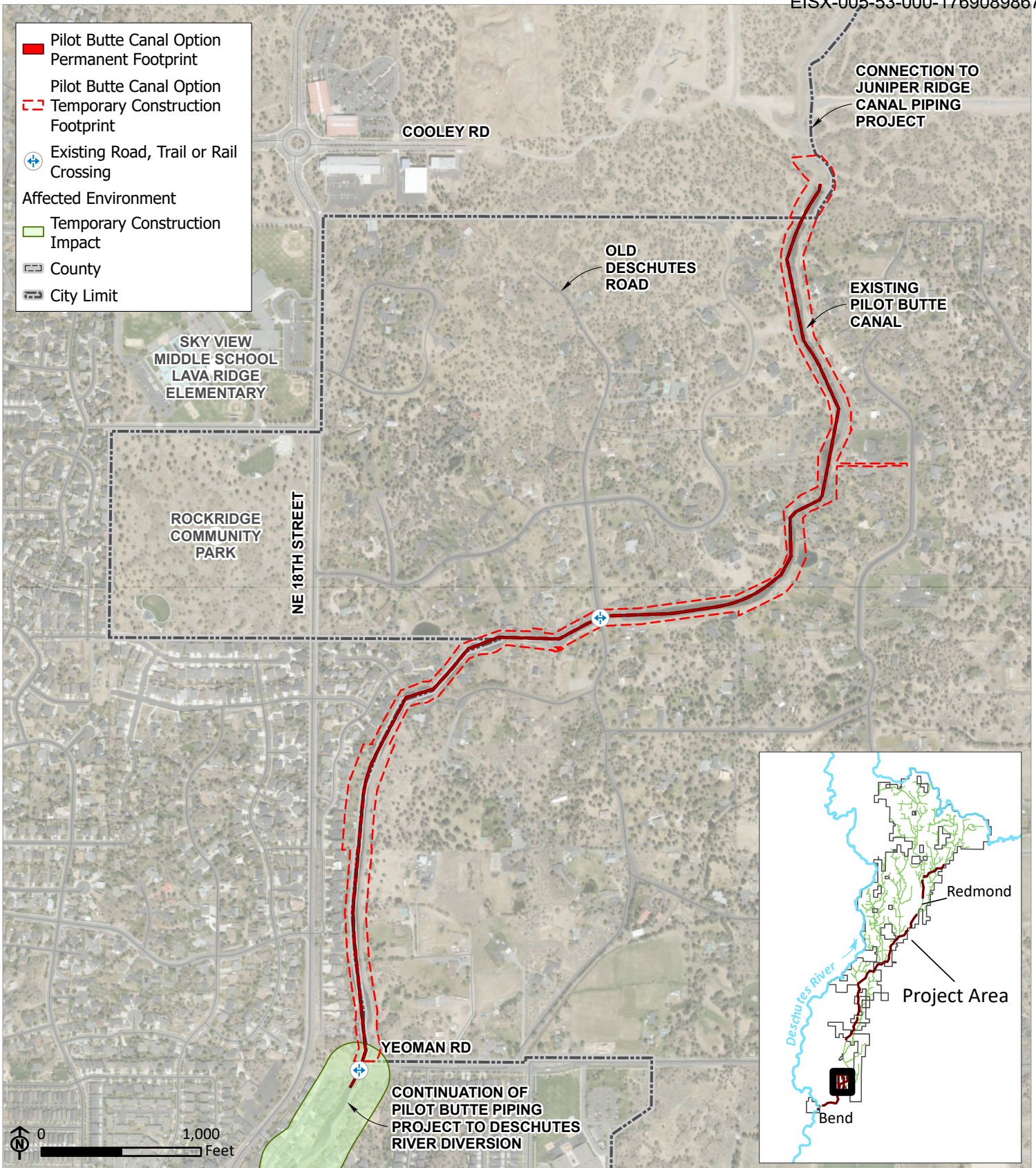
USFWS and NMFS. 2020. Final Deschutes Basin Habitat Conservation Plan. October 2020. Available at <https://www.fws.gov/sites/default/files/documents/DBHCP%20Volume%201%20December%2020_0.pdf>. Accessed September 3, 2023.

Appendix A

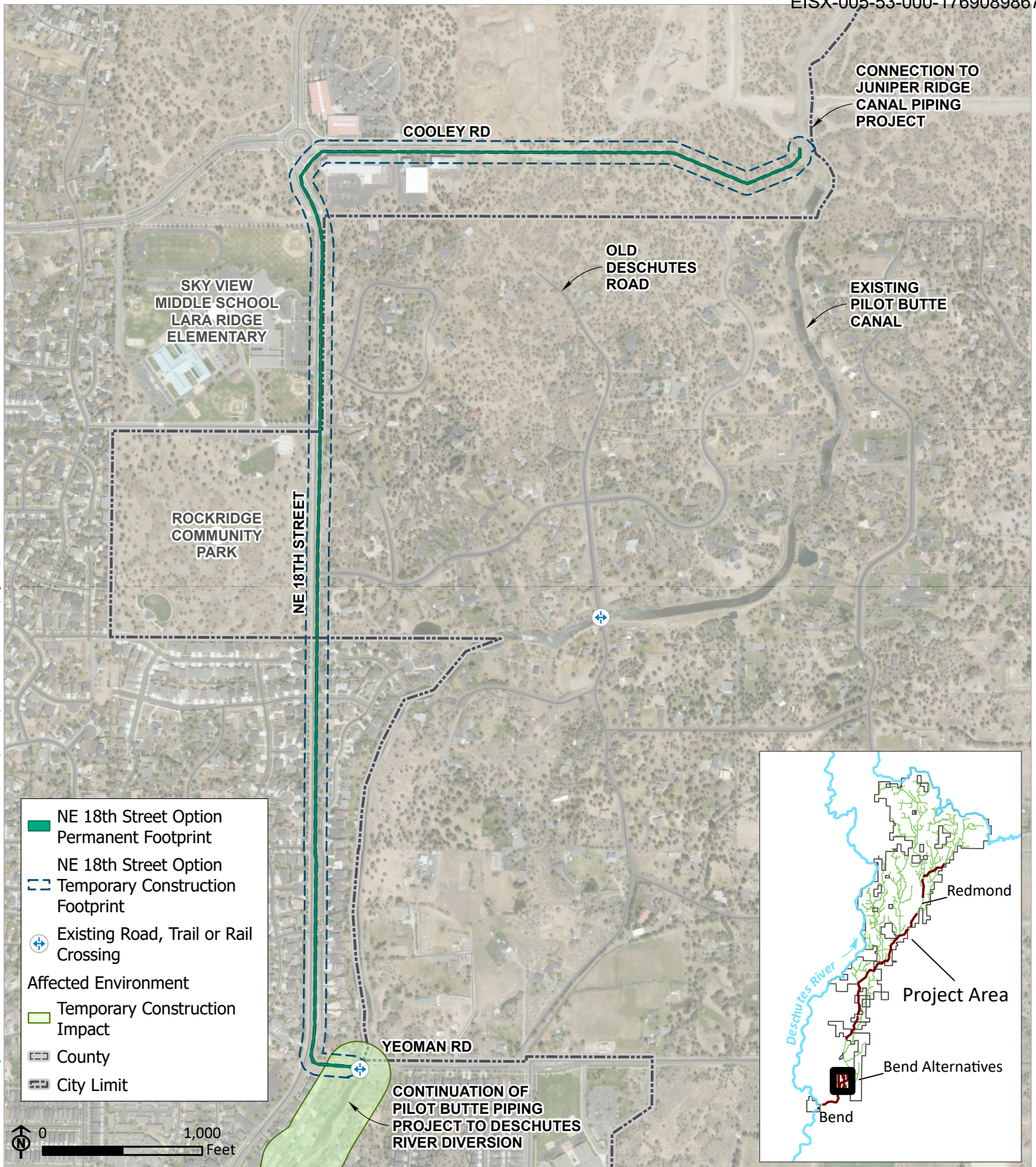
Figures



- Pilot Butte Canal Option
Permanent Footprint
- - - Pilot Butte Canal Option
Temporary Construction
Footprint
- + Existing Road, Trail or Rail
Crossing
- Affected Environment
- Temporary Construction
Impact
- County
- City Limit

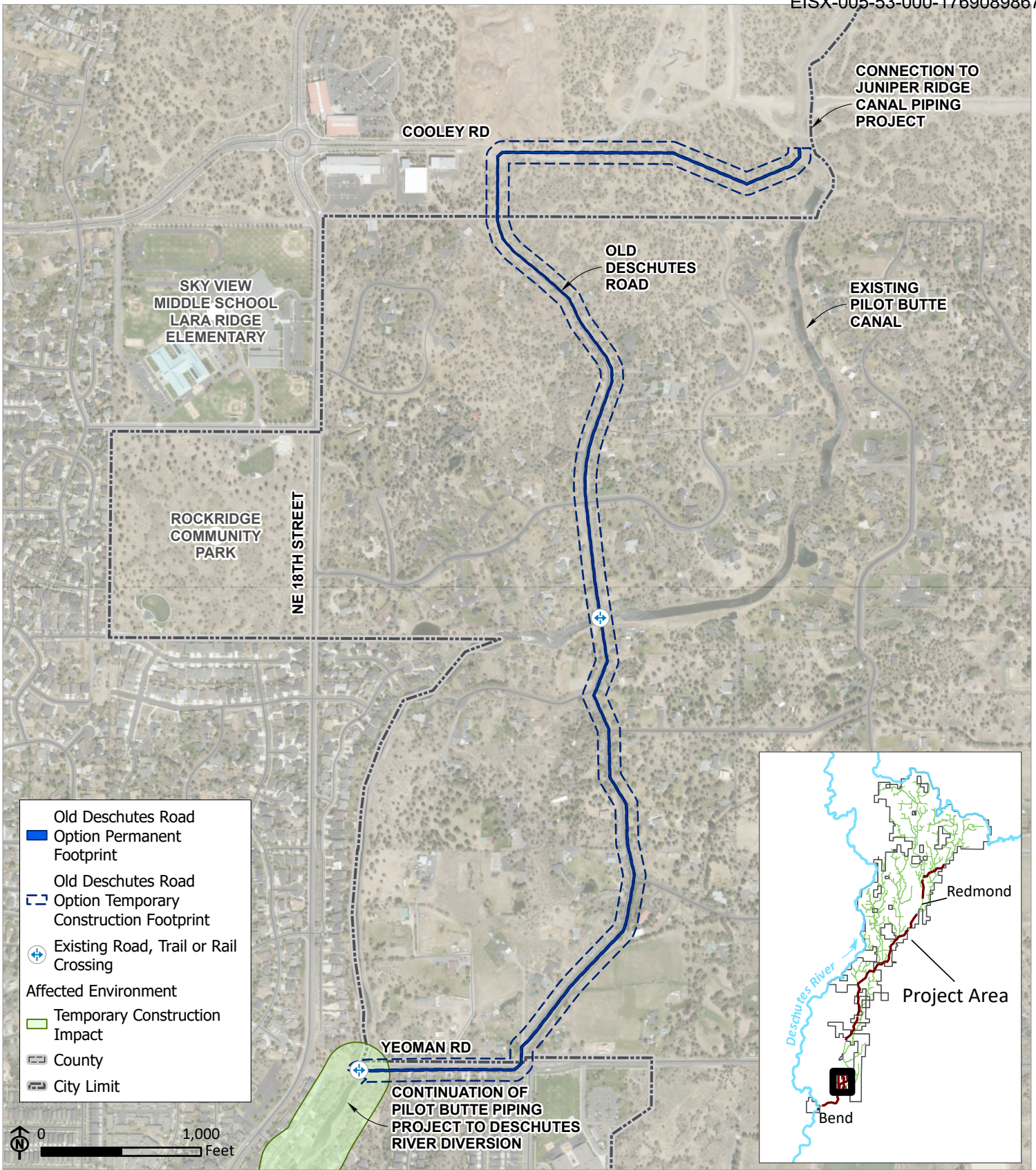


Default Folder: U:\Port\Projects\Clients\8194-COVID\73-8194-003 COVID Pilot Butte EIS\995\GIS\mapdocs\Templates\Pilot Butte_Canal_Piping_Template Date: 10/2/2023 2:45 PM

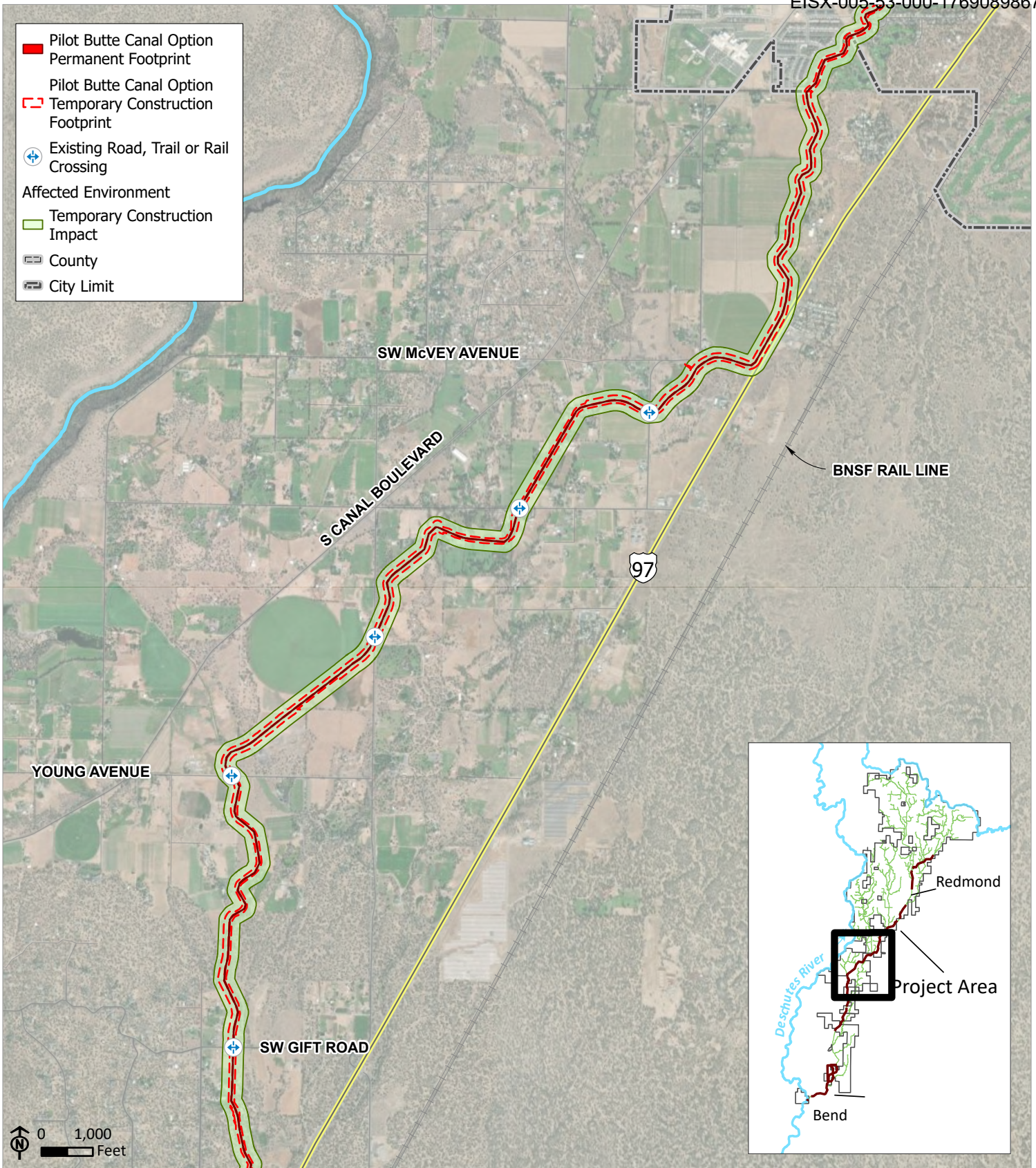


Default Folder: U:\Port\Projects\Clients\8194-COVID\73-8194-003 COVID Pilot Butte EIS\995\GIS\mapdocs\Templates\Pilot Butte_Canal_Piping_Template Date: 10/2/2023 2:45 PM

Default Folder: U:\Port\Projects\Clients\8194-COIDD\73-8194-003 COID Pilot Butte EIS\995\GIS\mapdocs\Templates\Pilot Butte_Canal_Piping_Template Date: 10/2/2023 2:45 PM

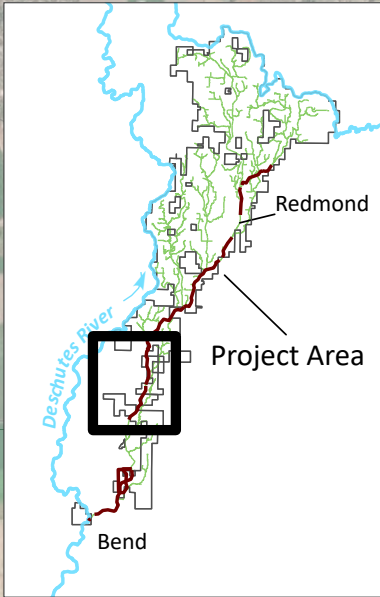


- Pilot Butte Canal Option Permanent Footprint
- ▬ Pilot Butte Canal Option Temporary Construction Footprint
- ⊕ Existing Road, Trail or Rail Crossing
- Affected Environment
- ▬ Temporary Construction Impact
- ▬ County
- ▬ City Limit



Default Folder: U:\Port\Projects\Clients\8194-COVID\273-8194-003 COVID Pilot Butte EIS\995\cs\GIS\mapdocs\Templates\Pilot Butte_Canal_Piping_Template Date: 10/2/2023 2:45 PM

- Pilot Butte Canal Option Permanent Footprint
- ▬ Pilot Butte Canal Option Temporary Construction Footprint
- + Existing Road, Trail or Rail Crossing
- Affected Environment**
- ▬ Temporary Construction Impact
- County
- City Limit



YOUNG AVENUE

97

BNSF RAIL LINE

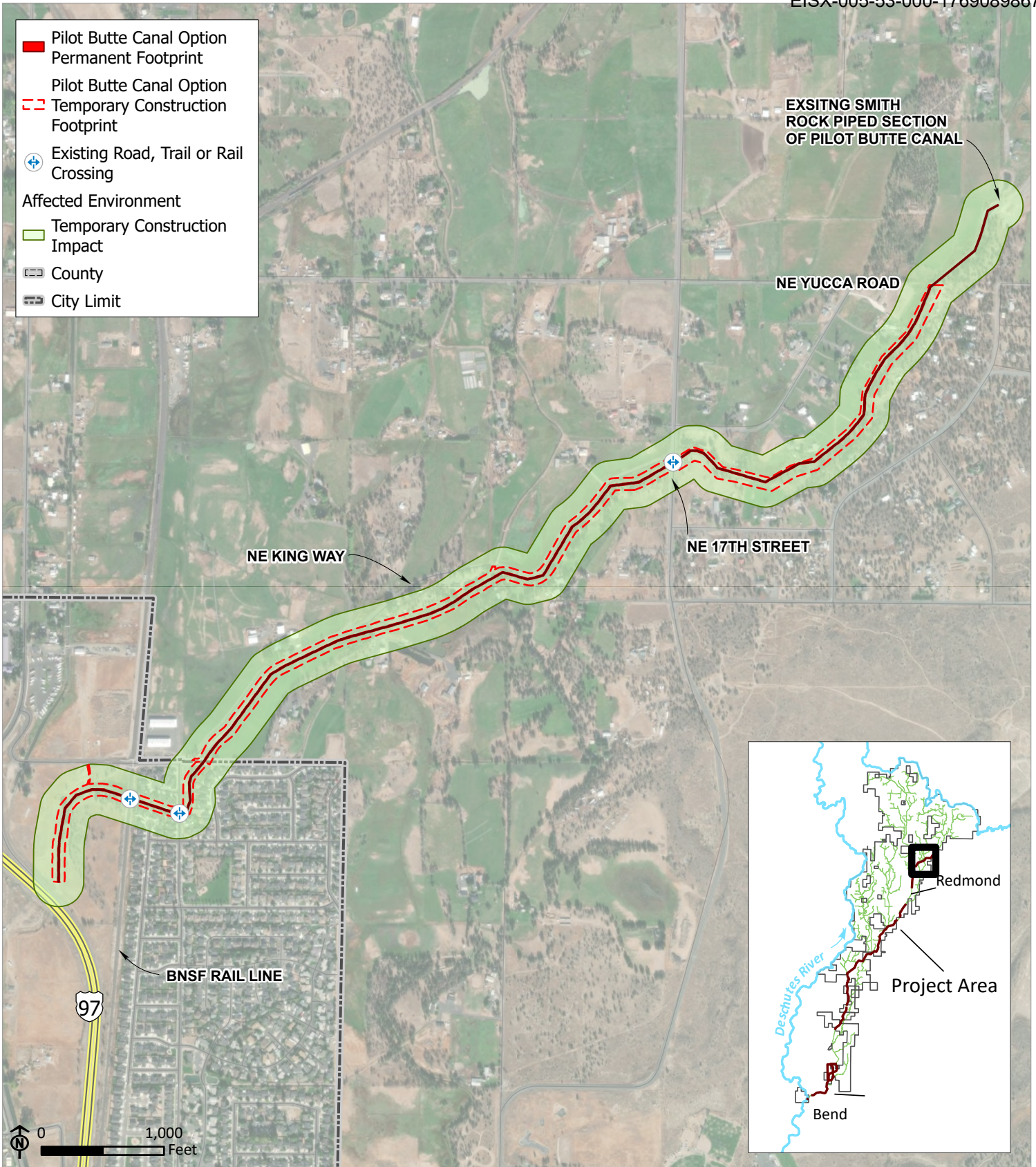
TUMALO ROAD

CONSTRUCTION ACCESS

EXISTING JUNIPER RIDGE PIPED SECTION OF PILOT BUTTE CANAL

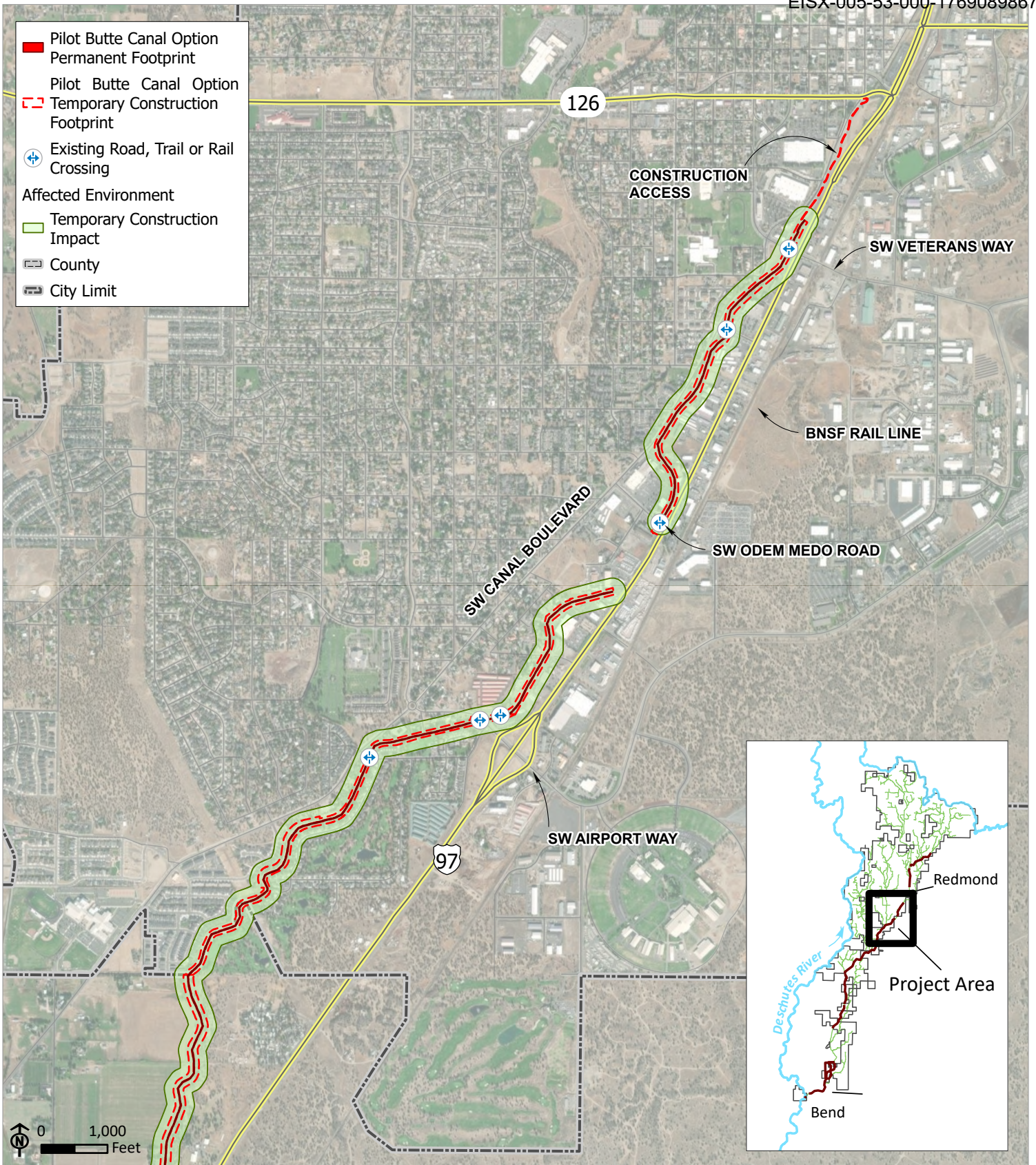
0 1,000 Feet

- Pilot Butte Canal Option
Permanent Footprint
- Pilot Butte Canal Option
Temporary Construction
Footprint
- + Existing Road, Trail or Rail
Crossing
- Affected Environment
- Temporary Construction
Impact
- County
- City Limit



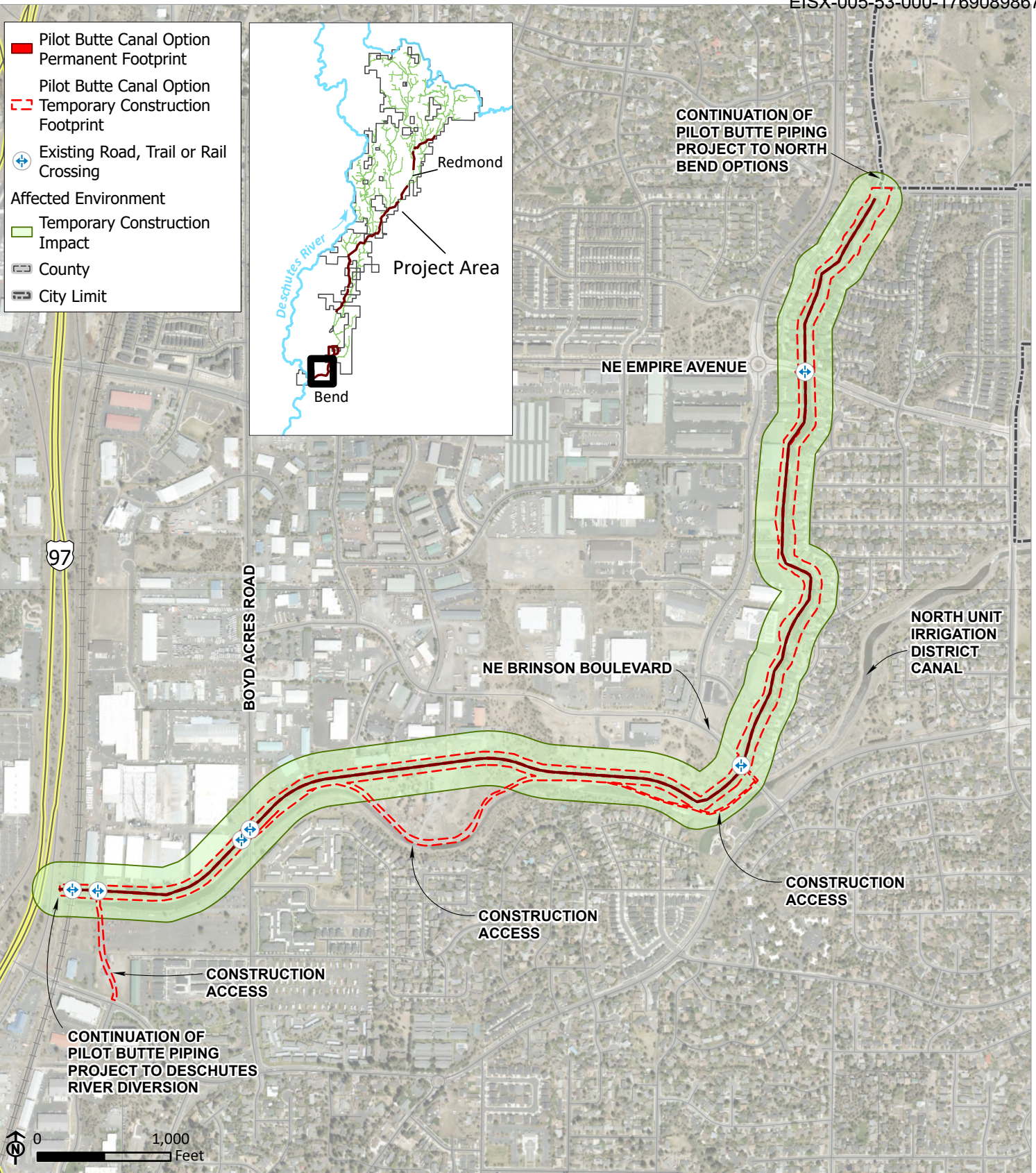
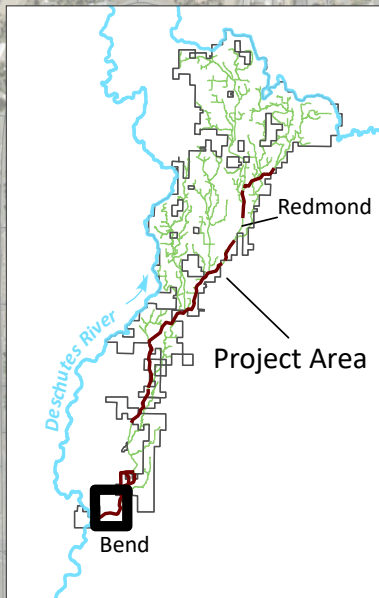
Default Folder: U:\Port\Projects\Clients\8194-COVID\273-8194-003 COVID Pilot Butte EIS\995\GIS\mapdocs\Disciplines\Templates\Pilot Butte Canal Piping_Template Date: 10/2/2023 2:45 PM

- Pilot Butte Canal Option Permanent Footprint
- - - Pilot Butte Canal Option Temporary Construction Footprint
- ⊕ Existing Road, Trail or Rail Crossing
- Affected Environment
- Temporary Construction Impact
- ▬ County
- ▬ City Limit



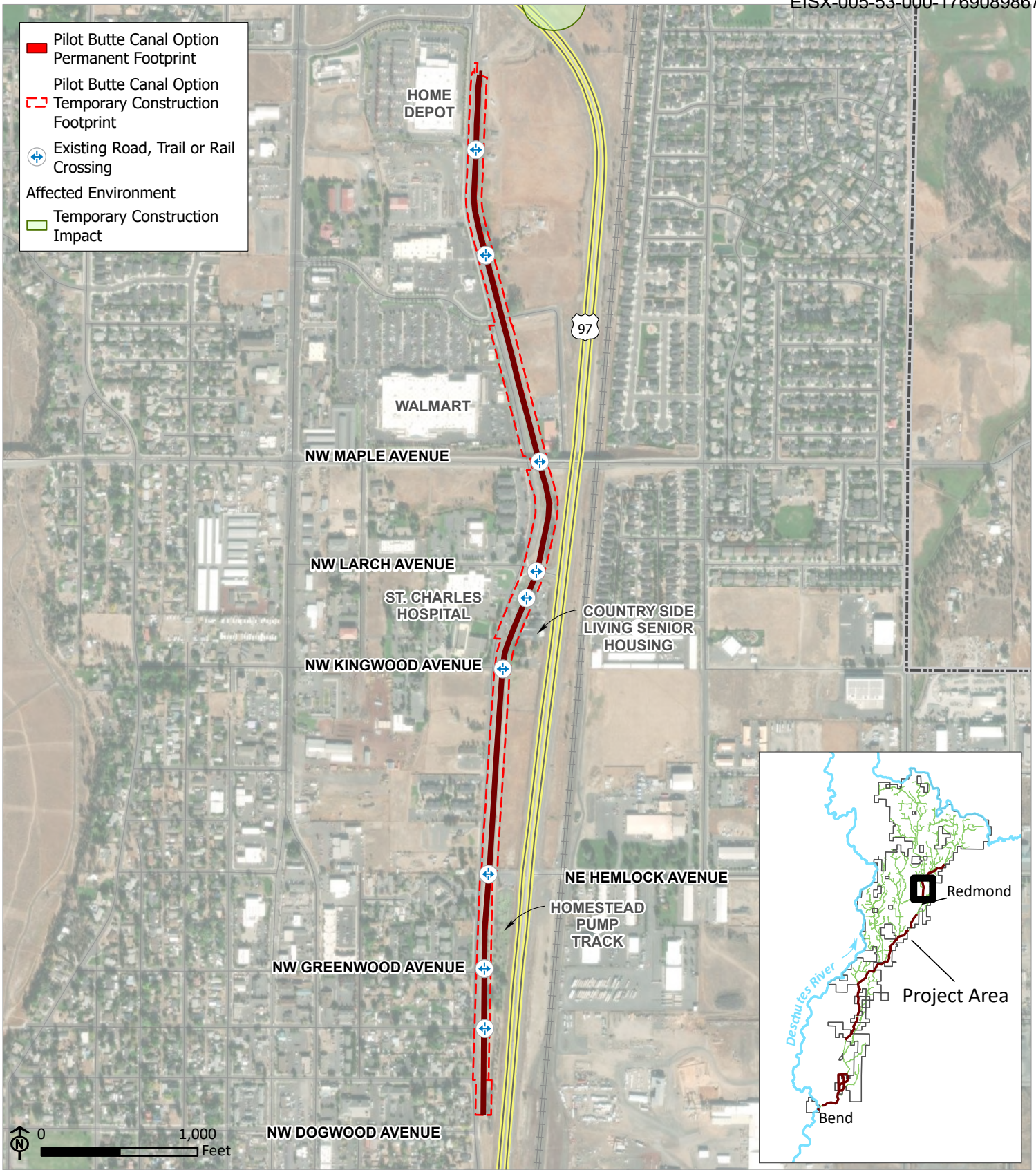
Default Folder: U:\Port\Projects\Clients\8194-COVID\273-8194-003 COVID Pilot Butte EIS\995\GIS\mapdocs\Disciplines\Templates\Pilot Butte Canal Piping_Template Date: 10/5/2023 11:01 AM

- Pilot Butte Canal Option
Permanent Footprint
- - - Pilot Butte Canal Option
Temporary Construction Footprint
- ⊕ Existing Road, Trail or Rail
Crossing
- Affected Environment
Temporary Construction
Impact
- ▭ County
- ▭ City Limit



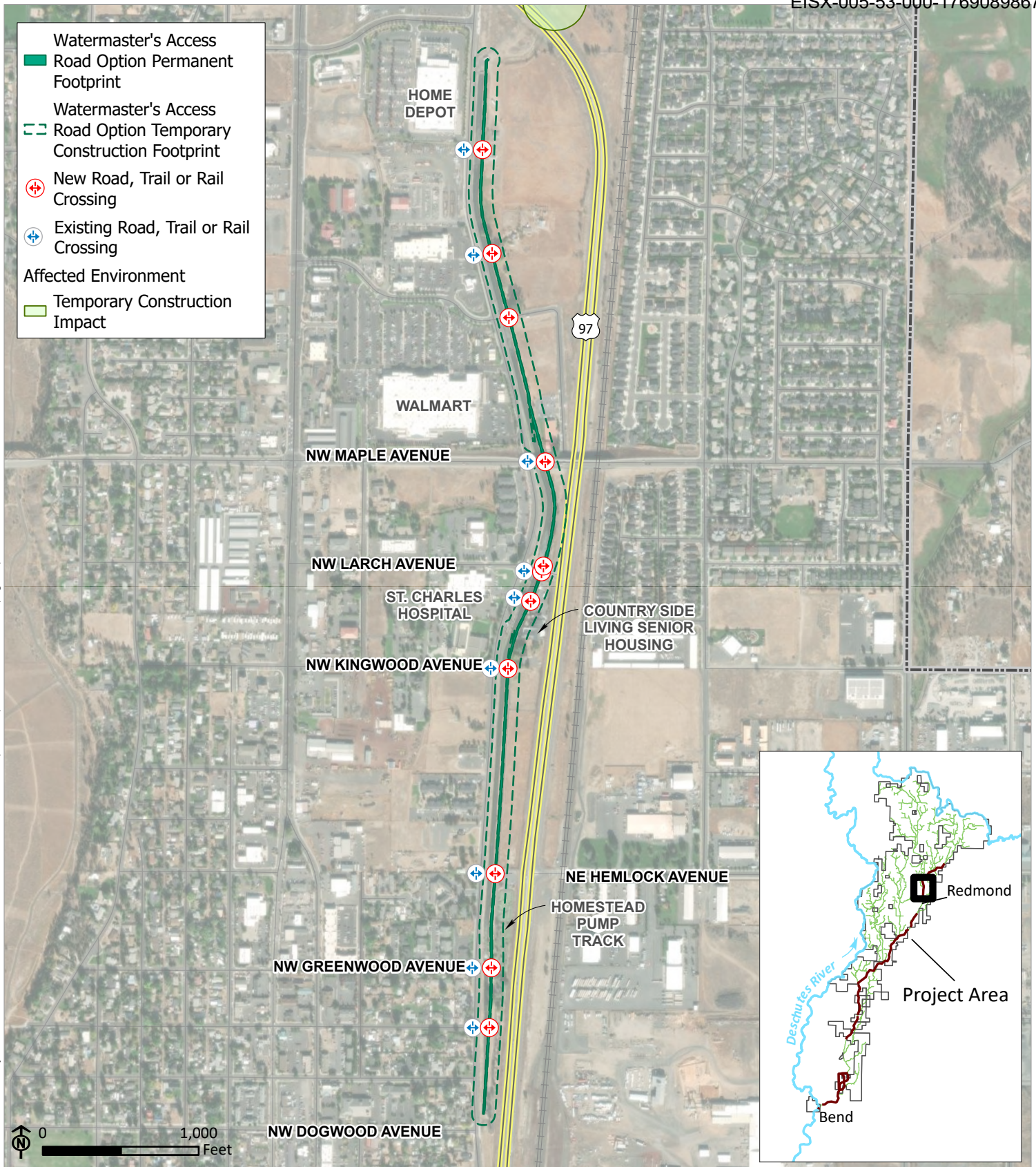
Default Folder: U:\Port\Projects\Clients\8194-COVID\73-8194-003 COVID Pilot Butte EIS\995\GIS\mapdocs\Templates\Pilot Butte_Canal_Piping_Template Date: 10/2/2023 2:45 PM

- Pilot Butte Canal Option Permanent Footprint
- ▬ Pilot Butte Canal Option Temporary Construction Footprint
- ⊕ Existing Road, Trail or Rail Crossing
- Affected Environment
- ▬ Temporary Construction Impact



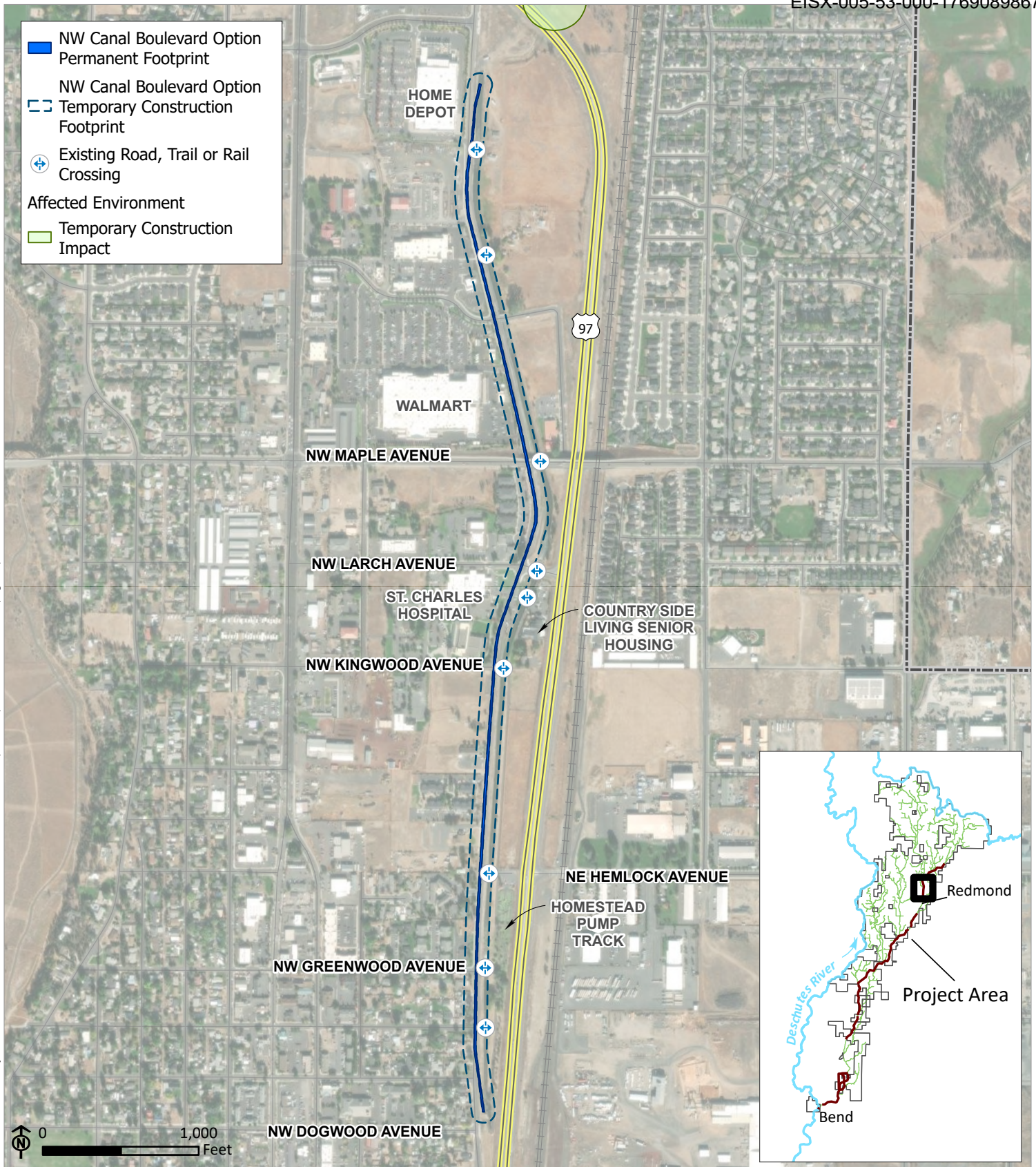
Default Folder: U:\Port\Projects\Clients\8194-COVID\273-8194-003 COVID Pilot Butte EIS\995\cs\GIS\mapdocs\Templates\Pilot Butte_Canal_Piping_Template Date: 10/2/2023 2:45 PM

- Watermaster's Access
- Road Option Permanent Footprint
- Watermaster's Access
- Road Option Temporary Construction Footprint
- New Road, Trail or Rail Crossing
- Existing Road, Trail or Rail Crossing
- Affected Environment
- Temporary Construction Impact



Default Folder: U:\Port\Projects\Clients\8194-COVID\273-8194-003 COVID Pilot Butte EIS\995\cs\GIS\mapdocs\Templates\Pilot Butte_Canal_Piping_Template Date: 10/2/2023 2:45 PM

- NW Canal Boulevard Option
Permanent Footprint
- NW Canal Boulevard Option
Temporary Construction Footprint
- ⊕ Existing Road, Trail or Rail
Crossing
- Affected Environment
Temporary Construction Impact



Default Folder: U:\Port\Projects\Clients\8194-COVID\273-8194-003 COVID Pilot Butte EIS\995\GIS\mapdocs\Templates\Pilot Butte_Canal_Piping_Template Date: 10/2/2023 2:45 PM

Source: Deschutes County GIS, Crook County GIS, Parameterix, NHD

Appendix B

Background Information



Photo Gallery



Photo No. 1. View of ODFW-compliant fish screens in Bend.



Photo No. 2. View of canal bounded by presumed fringe wetlands.



Photo No. 3. View of canal bounded by rubber rabbitbrush.



Photo No. 4. View of canal without water.



Photo No. 5. View of dry canal bounded by sedges, horsetail, and iris.



Photo No. 6. View of typical vicinity vegetation consisting of rubber rabbitbrush, big sagebrush, and juniper trees.



Photo No. 7. Adjacent NWI mapped wetlands located north of the PBC and south of the intersection of SW 46th Street and SW 43rd Street in Redmond.



Photo No. 8. View of fringe wetland consisting of sedges, cattail, and juniper trees.

DESCHUTES COUNTY WEED LIST

Deschutes County Weed Policy and Classification System

"Noxious Weed" means any weed designated by the Deschutes County Board of County Commissioners ("Board") that is injurious to public health, agriculture, recreation, wildlife, or any public or private property; any weed that impacts and displaces desirable vegetation, such as Threatened and Endangered plant species, wildlife habitat, and livestock.

It is acknowledged that certain noxious weeds have become so thoroughly established and are spreading so rapidly on private, state, county, and federally owned lands that they may have been declared by Oregon Revised Statute 569.350 to be a menace to public welfare. Steps leading to eradication where possible, and intensive control are necessary. It is further recognized that the responsibility for such eradication and intensive control rests not only on the private landowner and operator, but also the county, state and federal government.

Noxious Weed Control Rating System

Noxious Weeds, for the purpose of this system, shall be designated "A", "B" or "C"

1. An "A" designated weed is the highest priority noxious weed designated by the Board. The Weed Control District will comply with a state wide management plan and/or implement a county wide plan for intensive control and monitoring. An "A" rated weed may also be a weed of known economic or ecological importance which occurs in small enough infestations to make eradication or containment possible; or one that is not known to occur here, but its presence in neighboring counties make future occurrence here seem imminent.

Action: Infestations are subject to intensive eradication, containment or control when and where found.

2. A "B" designated weed is a weed that has the potential to cause economic or ecological harm to agriculture, recreation, wildlife and transportation systems. Distribution is limited in the County, region or State. Intensive control to limit or eliminate reproduction and spread will occur at the County level as resources and situations allow.

Action: Intensive containment, control and monitoring by the landowner is required.

3. A "C" designated weed is a weed that has the potential to cause economic or ecological harm to agriculture, recreation, wildlife and transportation systems. Distribution is widespread in the County, region or State, therefore eradication is unlikely and treatment is a lower priority.

Action: Control and monitoring by the landowner is recommended.

This list is available on the web at www.deschutes.org/weeds or by contacting Deschutes County at 541-322-7117.

“A” Rated Weeds:

<u>Common Name</u>	<u>Scientific Name</u>
African Rue+	<i>Peganum harmala</i>
Buffalobur	<i>Solanum rostratum</i>
Houndstongue	<i>Cynoglossum officinale</i>
Dyer’s woad **	<i>Isatis tinctoria</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
False brome+	<i>Brachypodium sylvaticum</i>
Giant reed+	<i>Arundo donax</i>
Hoary alyssum**	<i>Berteroa incana</i>
Hydrilla+	<i>Hydrilla verticillata</i>
Leafy spurge	<i>Euphorbia esula</i>
Meadow (Tyrol) knapweed+	<i>Centaurea nigrescens</i>
Mediterranean sage+	<i>Salvia aethiopis</i>
Medusahead rye	<i>Taeniatherum caput-medusae</i>
Musk (Nodding plumeless) thistle**	<i>Carduus nutans</i>
Orange hawkweed	<i>Hieracium aurantiacum</i>
Perennial pepperweed	<i>Lepidium latifolium</i>
Purple loosestrife**	<i>Lythrum salicaria</i>
Rush skeletonweed+	<i>Chondrilla juncea</i>
Russian knapweed+	<i>Acroptilon repens</i>
Saltcedar tamarix	<i>Tamarix ramosissima</i>
Scotch thistle	<i>Onopordum acanthium</i>
Squarrose knapweed+	<i>Centaurea virgata</i>
Sulfur cinquefoil+	<i>Potentilla recta</i>
Tansy ragwort	<i>Senecio jacobaea</i>
Ventenata grass	<i>Ventenata dubia</i>
Water primrose**	<i>Ludwigia sp.</i>
Whitetop; Hoary cress	<i>Cardaria draba</i>
Wild carrot	<i>Daucus carota</i>
Yellow floating heart	<i>Nymphoides sp.</i>
Yellow star-thistle **	<i>Centaurea solstitialis</i>

“B” Rated Weeds:

<u>Common Name</u>	<u>Scientific Name</u>
Canada thistle	<i>Cirsium arvense</i>
Dalmatian toadflax	<i>Linaria dalmatica</i>
Diffuse knapweed	<i>Centaurea diffusa</i>
Myrtle spurge	<i>Euphorbia myrsinites</i>
Poison hemlock	<i>Conium maculatum</i>
Puncturevine	<i>Tribulus terrestris</i>
Ribbongrass	<i>Phalaris arundinacea var. picta</i>

Common Name**Scientific Name**

Scotch broom
 Spotted knapweed
 Yellow toadflax
 Yellow flag iris

Cytisus scoparius
Centaurea stoebe
Linaria vulgaris
Iris pseudacorus

“C” Rated Weeds:**Common Name****Scientific Name**

Bull thistle
 Bur buttercup
 Cheatgrass; Downy brome
 Common mullein
 Dodder
 Field bindweed
 Filaree redstem
 Horseweed
 Oxeye daisy
 Kochia
 Poverty sumpweed
 Quackgrass
 Reed canarygrass
 Russian thistle
 Spiny cocklebur
 St. Johnswort
 Western water hemlock/

Cirsium vulgare
Ceratocephala testiculata
Bromus tectorum
Verbascum thapsus
Cuscuta sp.
Convolvulus arvensis
Erodium cicutarium
Conyza canadensis
Leucanthemum vulgare
Bassia scoparia
Iva axillaris
Elymus repens
Phalaris arundinacea
Salsola kali
Xanthium spinosum
Hypericum perforatum
Cicuta douglasii

+ Currently not in the County (but potential threat)

**All known populations have been eradicated

/ Natives but poisonous to animals or humans

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Deschutes County, Oregon



Local office

Oregon Fish And Wildlife Office

☎ (503) 231-6179

📅 (503) 231-6195

2600 Southeast 98th Avenue Suite 100

2000 Southeast 30th Avenue, Suite 100
Portland, OR 97266-1398

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

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 from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

-
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Gray Wolf <i>Canis lupus</i> There is final critical habitat for this species. https://ecos.fws.gov/ecp/species/4488	Endangered

Birds

NAME	STATUS
Yellow-billed Cuckoo <i>Coccyzus americanus</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Amphibians

NAME	STATUS
Oregon Spotted Frog <i>Rana pretiosa</i> Wherever found There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6633	Threatened

Fishes

NAME	STATUS
Bull Trout <i>Salvelinus confluentus</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8212	Threatened

Insects

NAME	STATUS
------	--------

Monarch Butterfly *Danaus plexippus*

Candidate

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/9743>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the [Bald and Golden Eagle Protection Act](#) and the [Migratory Bird Treaty Act](#).

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds
<https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds
<https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON

Bald Eagle *Haliaeetus leucocephalus*

Breeds Dec 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Golden Eagle *Aquila chrysaetos*

Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1680>

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

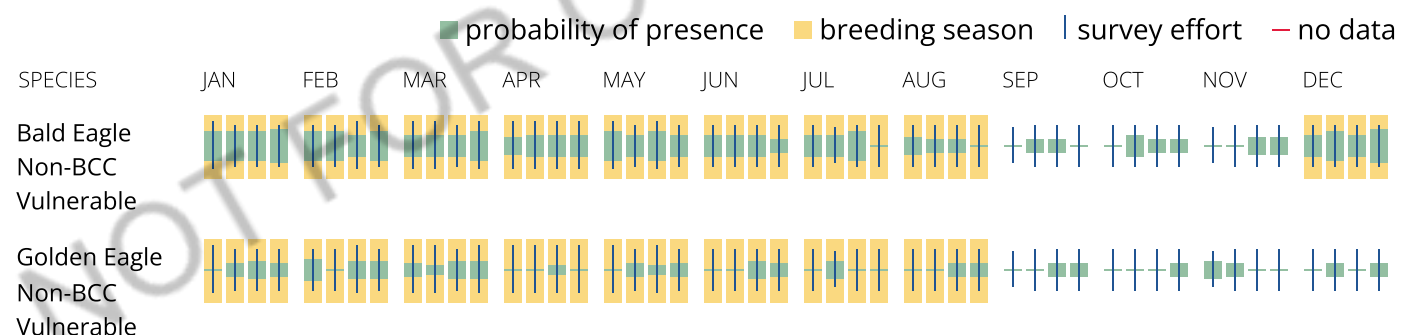
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply). To see a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the [Eagle Act](#) should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see

exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American White Pelican <i>pelecanus erythrorhynchos</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6886	Breeds Apr 1 to Aug 31
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31
California Gull <i>Larus californicus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
Cassin's Finch <i>Carpodacus cassinii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15
Evening Grosbeak <i>Coccothraustes vespertinus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10

Golden Eagle *Aquila chrysaetos*

Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1680>

Lewis's Woodpecker *Melanerpes lewis*

Breeds Apr 20 to Sep 30

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9408>

Long-eared Owl *asio otus*

Breeds Mar 1 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3631>

Olive-sided Flycatcher *Contopus cooperi*

Breeds May 20 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3914>

Pinyon Jay *Gymnorhinus cyanocephalus*

Breeds Feb 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9420>

Rufous Hummingbird *selasphorus rufus*

Breeds Apr 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/8002>

Sage Thrasher *Oreoscoptes montanus*

Breeds Apr 15 to Aug 10

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

<https://ecos.fws.gov/ecp/species/9433>

Western Grebe *aechmophorus occidentalis*

Breeds Jun 1 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/6743>

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

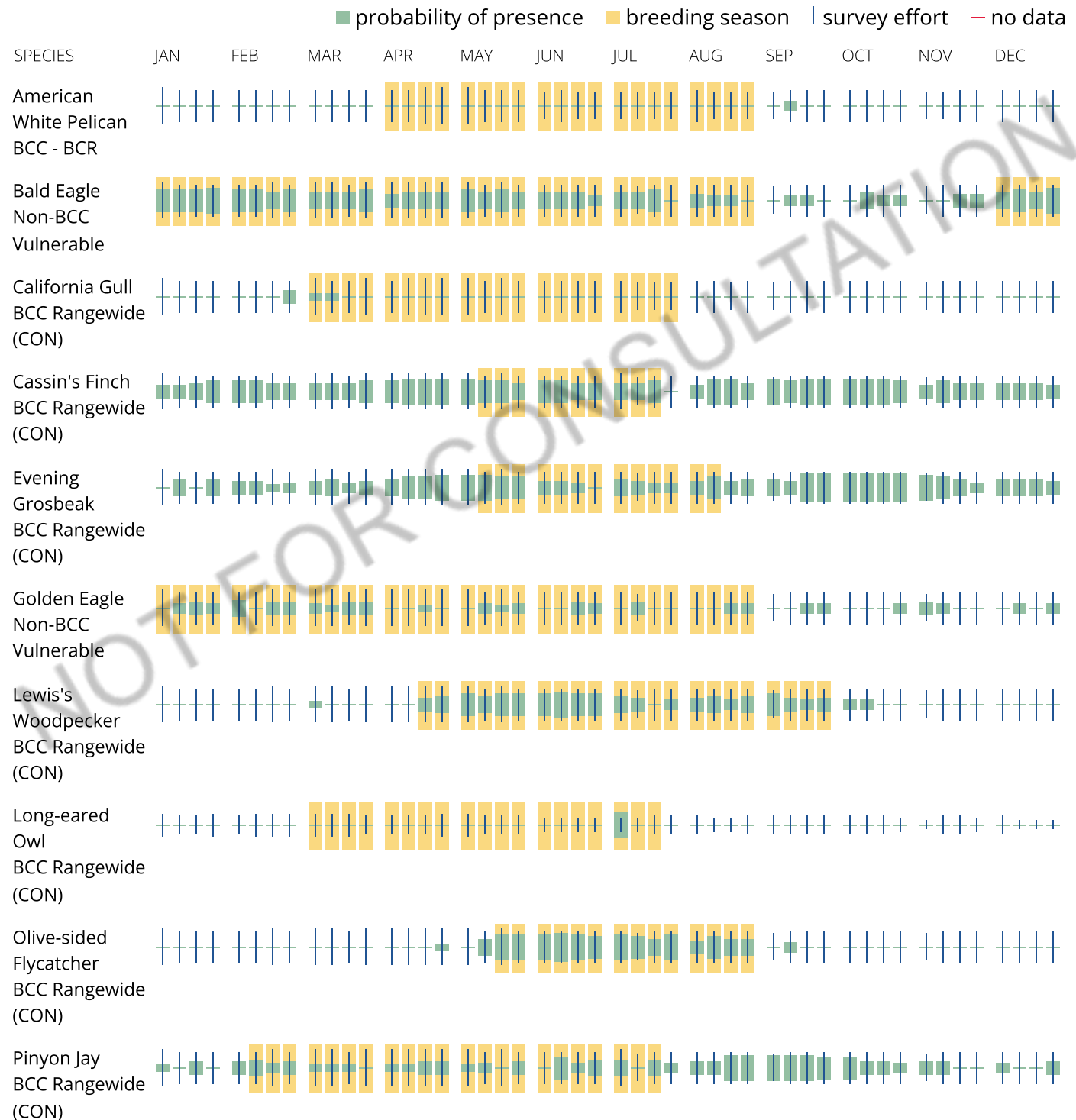
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

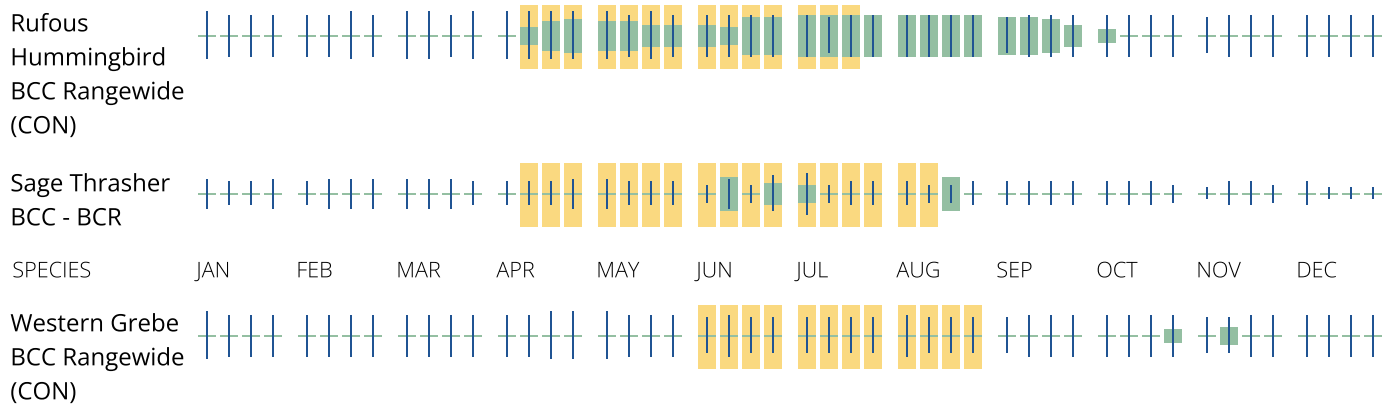
No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

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](#).

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the [NWI map](#) to view wetlands at this location.

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 tubercid 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

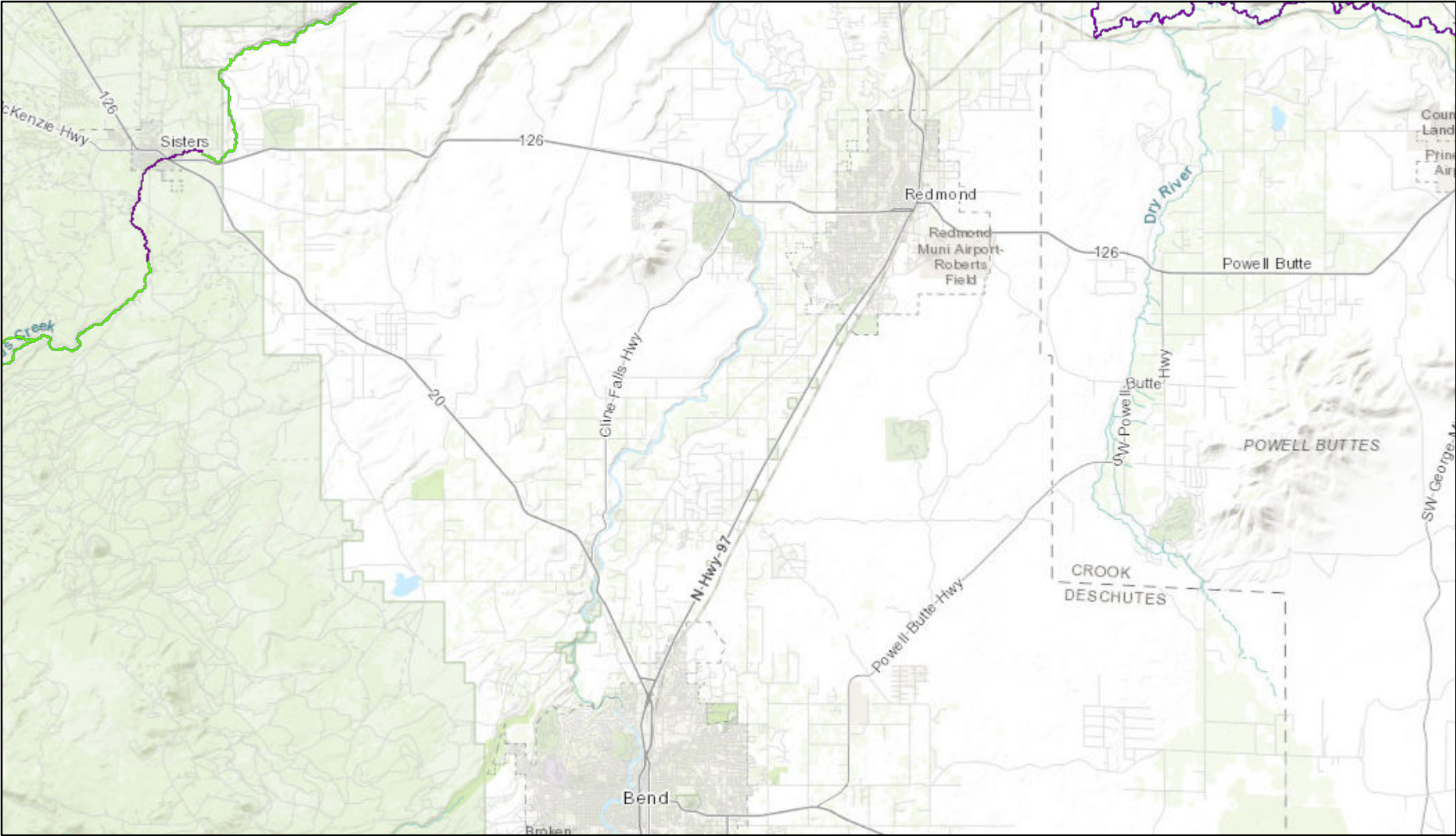
government or to establish the geographical scope of the regulatory programs of government agencies.

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.

NOT FOR CONSULTATION

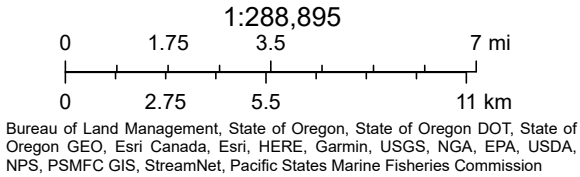
StreamNet

EISX-005-53-000-1769089867



10/31/2023, 4:46:35 PM

- | | | | | |
|-------------------------------------|--|--|-----------------------------------|-----------------------------------|
| <div></div> Columbia Basin Boundary | <div></div> Rearing and migration Bull Trout | <div></div> Spawning and rearing | <div></div> Rearing and migration | <div></div> Rearing and migration |
| <div></div> Rainbow Trout | <div></div> Spawning and rearing | <div></div> Foraging | <div></div> Spawning and rearing | <div></div> Spawning and rearing |
| <div></div> Foraging | <div></div> Year-round use | <div></div> Migration only | <div></div> Unknown | <div></div> Unknown |
| <div></div> Migration only | <div></div> Unknown | <div></div> Nodal (adult residence) Summer Steelhead | <div></div> Unknown | <div></div> Unknown |
| <div></div> Nodal (adult residence) | <div></div> Rearing and migration | <div></div> Migration only | <div></div> Migration only | |





U.S. Fish and Wildlife Service

National Wetlands Inventory

National Wetland Inventory

EISX-005-53-000-1769089867



October 31, 2023

Wetlands

	Estuarine and Marine Deepwater		Freshwater Emergent Wetland		Lake
	Estuarine and Marine Wetland		Freshwater Forested/Shrub Wetland		Other
			Freshwater Pond		Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



U.S. Fish and Wildlife Service

National Wetlands Inventory

National Wetlands Inventory

EISX-005-53-000-1769089867



October 31, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



U.S. Fish and Wildlife Service

National Wetlands Inventory

National Wetlands Inventory

EISX-005-53-000-1769089867



October 31, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.