



**PUBLIC REVIEW DRAFT**  
**APPENDIX F**

2023 Regional Transportation Plan

# Environmental assessment and potential mitigation strategies

July 10, 2023

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Project website: [oregonmetro.gov/rtp](http://oregonmetro.gov/rtp)

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## Purpose

In accordance with federal regulations [23 CFR 450.320](#) (development of programmatic mitigation plans) and [23 CFR 450.324](#) (development and content of the metropolitan transportation plan) Metro developed the 2023 Regional Transportation Plan (RTP) environmental assessment and mitigation activities. The purpose of the assessment is to identify vegetation, aquatic, and terrestrial wildlife species and habitat, wetlands, floodplains, and other biological, tribal, and historic resources that intersect with and may be affected by projects in the plan and identify mitigation activities to address the potential environmental impacts of future transportation projects.<sup>1, 2</sup>

To complete the assessment, Metro consulted with Tribes, Federal, State, land management, wildlife, and regulatory agencies, and Metro Parks and Nature staff, during the planning process to review the RTP update work plan, to identify the data, methods, and approach to be used in this assessment, and to review and identify mitigation activities. Following these consultations, Metro shared the preliminary results of the assessment with the agencies and interested Tribes, and incorporated input into the public review draft of the RTP. Summaries of Tribal Consultation and Agency discussions will be created with the respective interested Tribes and Agencies who responded to Metro's invitation to consult on the development of the RTP and included in the public comment report for the RTP.

Consistent with the federal regulations listed above, the environmental assessment and identified mitigation activities focus on water and fish; high value habitat and connectivity; floodplains and flood hazard areas; federally recognized Tribal lands<sup>3</sup>; historic places; and urban heat islands. In addition to the environmental data included in the previous RTP, new data for urban heat islands, White Oak prairie habitat, habitat connectivity, and wildlife collisions on state highways were added to the assessment for the 2023 RTP.

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<sup>1</sup> The federal government defines Metropolitan Transportation Planning requirements in the Code of Federal Regulations for Title 23, Chapter 1, Subchapter E, Part 450, Subpart C, §450.324 Development and content of the metropolitan transportation plan, sections (f) (10) and (g) (1) and (2).

<sup>2</sup> As defined in the Code of Federal Regulations (CFR) for Title 23 §450.104, Environmental mitigation activities means strategies, policies, programs, and actions that, over time, will serve to avoid, minimize, rectify, reduce or eliminate impacts to environmental resources associated with the implementation of a long-range statewide transportation plan or metropolitan transportation plan. Appendix E documents the system-level transportation equity evaluation conducted for the RTP and environmental justice mitigation strategies.

<sup>3</sup> As defined by the U.S. Bureau of Indian Affairs, federally recognized tribal lands refers an area of land reserved for a Tribe or Tribes under treaty or other agreement with the United States, executive order, or federal statute or administrative action as permanent Tribal homelands, and where the federal government holds title to the land in trust on behalf of the Tribe. Approximately 56.2 million acres are held in trust by the United States for various Indian Tribes and individuals. Some reservations are the remnants of a Tribe's original land base. Others were created by the federal government for the resettling of Indian people forcibly relocated from their homelands. Not every federally recognized Tribe has a reservation. Federal Indian reservations are generally exempt from state jurisdiction, including taxation, except when Congress specifically authorizes such jurisdiction.

Findings from the assessment are also included in Chapter 7 of the RTP. Greenhouse gas emissions and air quality are addressed separately in Appendix J and Chapter 7, respectively, of the RTP.

Refer to the 2023 RTP Glossary of Terms for definitions for terms used in this Appendix.

## Introduction: Protecting the Environment

Transportation facilities and vehicles affect the natural and built environment in many ways, with significant negative impacts on climate change, air quality, water quality, noise levels, and fish and wildlife and habitat, and public health. When asked about the most important goals for the future of the region, people have consistently identified improving air and water quality, caring for and restoring streams and rivers and protecting natural areas and wildlife habitats as priorities.<sup>4</sup>

The transportation system planning process provides an opportunity to identify natural resources that could be affected by proposed projects and warrant special consideration during the more detailed project development process. While specific project designs and mitigation strategies are identified during the project development process, it is necessary to identify impacts during planning so that project costs can be accurately and to provide an accurate assessment of which projects and type of projects intersect with and could damage water and fish, habitat quality and connectivity, floodplains, and tribal, historic, and unique and irreplaceable cultural places or archeological resources. Identifying these areas of greatest potential conflict early in the transportation planning and design process allows for more meaningful application of mitigation strategies, including project alignment, design and construction features that avoid or minimize impacts on the resource area, or correcting environmental problems created by previous projects at the site such as road projects with insufficient permeability to support effective fish and wildlife migrations.

The greater Portland region is situated at the northern end of the Willamette Valley ecoregion, a fertile river valley surrounded by dramatic natural features - the Coast range to the west, the Cascades to the east and the Columbia River to the north (including the Columbia River Gorge National Scenic Area). In the region the natural landscape is created by broad river valleys with wetlands, narrow river canyons with riparian vegetation, buttes and forests, mountains and meadows, foothills, and farms.

### Approaches to Environmental Protection

The way we think about the environment and consider environmental protection has changed over the years and differs from culture to culture. Below are definitions of some key frameworks for which to consider the natural environment.

*Reciprocity:* A moral and practical obligation for humans and biota to care for and sustain one another (Example: First Foods)

*Sustainability:* The goal of preserving the natural environment and resources for future generations of humans

*Conservation:* The management of natural resources to ensure proper use and prevent exploitation, destruction, or neglect

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<sup>4</sup> Portland Metro 2040 Vision Survey. Conducted by Fairbank, Maslin, Maullin, Metz & Associates on October 24-30, 2017 and Oregon Values and Beliefs Project led by DHM Research, statewide survey conducted in April and May 2013.

The lands now known as the greater Portland metropolitan area are part of the aboriginal homelands, traditional use areas and trade networks of numerous Tribes. For millennia, Indian people resided throughout the Willamette Valley and along the Willamette and Columbia Rivers and their tributaries in traditional villages, permanent communities and seasonal encampments. The relationship of Tribes, their lands and interests extend from time immemorial to the present day and beyond. Each Tribes interests are distinct. These interests may overlap and intersect with the static boundaries of Metro’s service area, metropolitan planning area boundary for the RTP and the urban growth boundary in various ways.

The protection of natural resources has been a key concern of Metro since its founding in 1979. The preamble of the 1992 Metro Charter proclaims that “Metro’s most important service is to preserve and enhance the quality of life and the environment for ourselves and future generations.” This ethic of sustainability is central to Metro plans and programs, including the Regional Transportation Plan, Climate Smart Strategy, Greenspaces Master Plan, Nature in Neighborhoods Initiative and the region’s overarching land use and transportation strategy for managing growth, the 2040 Growth Concept. Clean air and water and healthy ecosystems is one of the six desired outcomes adopted by the Metro Council in 2008.

The **2040 Growth Concept** is a long-range plan that reflects input given by thousands of Oregonians in the 1990s and adopted by the Metro Council in 1995. Policies in the 2040 Growth Concept encourage:

- safe and stable neighborhoods for families
- compact development that uses land and money efficiently
- a healthy economy that generates jobs and business opportunities
- protection of farms, forests, rivers, streams and natural areas
- a balanced transportation system to move people and goods
- housing for people of all incomes in every community.

Ten urban design components are identified in the 2040 Growth Concept as the focal points for growth – the central city, town centers, main streets, regional centers, station communities, neighborhoods, transportation corridors, industrial areas and freight, parks and natural areas (lands that will remain undeveloped, both inside and outside the urban growth boundary. These include parks, stream and trail corridors, wetlands and floodplains), rural reserves (large areas outside the urban growth boundary that will remain undeveloped through 2060; these areas are reserved to provide long-term protection for agriculture, forestry or important natural landscape features that limit urban development



or help define appropriate natural boundaries for development, including plant, fish and wildlife habitat, steep slopes and floodplains), and neighboring cities.

## Section 1. Environmental Regulations and Protections

Construction of projects identified in the Regional Transportation Plan (RTP) are subject to Federal, State, and local regulations concerning impacts to biological and historic resources.<sup>5</sup>

The project-level environmental review and permitting process is a separate and more detailed process than what is required for the RTP. This is because many regionally significant projects identified in the RTP are conceptual in nature, with exact alignment, design, and other project scope elements to be determined in the project development process. Further, for many projects, this process may not occur for years, or even decades. The specific types of environmental mitigation activities implemented are ultimately determined by the governing regulatory authority and are dependent upon the resource being impacted and the severity of that impact.

Transportation agencies partner with Federal and State natural, cultural, and historic resource agencies for the environmental review of transportation projects. Additionally, transportation agencies consult with federally recognized Tribes.

During project development, transportation agencies determine what environmental mitigations are needed in consultation with numerous Federal, State, and local agencies, and federally recognized tribes, as well as interested parties responsible for and interested in environmental stewardship, including but not limited to (listed in alphabetical order):

### Native American Tribes

- Confederated Tribes of Grand Ronde
- Confederated Tribes of Siletz Indians
- Confederated Tribes of the Umatilla Indian Reservation
- Confederated Tribes of Warm Springs
- Confederated Tribes and Bands of the Yakama Nation
- Nez Perce Tribe
- Cowlitz Indian Tribe

### Resource agencies

- Clackamas County Water Environment Services
- Clean Water Services

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<sup>5</sup> Federal regulations apply to any federally funded project or a state or locally funded project requiring a federal action.

- Metro Parks and Nature
- National Marine Fisheries Service (NOAA)
- National Park Service (Pacific West Region)
- Oregon Department of Agriculture
- Oregon Water Resources Department
- Oregon Watershed Enhancement Board
- Oregon Department of State Lands
- Oregon Department of Fish and Wildlife
- Oregon Department of Forestry
- Portland Bureau of Environmental Services
- United States Environmental Protection Agency
- United States Fish and Wildlife Service
- United States Forest Service
- United States Bureau of Land Management

**Federal, state, and local agencies**

- Bonneville Power Administration
- Federal Aviation Administration
- Federal Highway Administration
- Federal Railroad Administration
- Federal Transit Administration
- Federal Transit Administration
- United States Army Corps of Engineers
- United States Department of Labor
- United States Department of Veterans Affairs
- United States Coast Guard
- Oregon Bureau of Labor and Industries
- Oregon Department of Energy
- Oregon Department of Environmental Quality
- Oregon Department of Land Conservation and Development
- Oregon Department of Transportation
- Oregon Department of Veterans Affairs
- Oregon Parks and Recreation Department

- Oregon State Historic Preservation Office
- Portland of Portland
- Port of Vancouver
- TriMet
- South Metro Area Regional Transit (SMART)
- C-TRAN
- Southwest Washington Regional Transportation Council (RTC)

### 1.1 Threatened and endangered species, including vertebrate species and plants

**Table 1** identifies potentially occurring threatened and endangered wildlife species in Oregon as of May 2018. This list has been updated from the list of species that were considered during Metro’s Goal 5 inventory process (Title 13 of the Urban Growth Management Plan) in 2001.<sup>6</sup> The Endangered Species Act of 1973 (ESA; 16 U.S.C. § 1531 et seq.) is one of the U.S. environmental laws passed in the 1970s, and was designed to protect critically imperiled species from extinction as a "consequence of economic growth and development un-tempered by adequate concern and conservation."

Section 7 of the Endangered Species Act directs all Federal agencies, including the Federal Highway Administration, to ensure that any action they authorize, fund, or carry-out does not jeopardize the continued existence of an endangered or threatened species or designated or proposed critical habitat (collectively, referred to as protected resources). The implementing regulations, 50 CFR 402, specify how Federal agencies are to fulfill their section 7 consultation requirements.

Under the implementing regulations of Section 7 of the Endangered Species Act (50 CFR 402), Federal agencies must review their actions and decide whether the action may affect federally listed and proposed species or proposed or designated critical habitat. Section 7(a)(2) of the ESA requires Federal agencies to ensure that their actions are not likely to jeopardize, destroy or adversely change the continued existence of a listed threatened or endangered species. To do this, Federal agencies must request from the U.S. Fish and Wildlife Service a list of species and critical habitat that may be in the project area.

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<sup>6</sup> While Pacific Lamprey (*Lampreta tridentata*) are not listed here, the species is traditionally and culturally significant to multiple Tribes and is crucial to the conservation of Pacific ecosystems and indigenous culture. While lampreys are not listed as threatened or endangered status – pacific lamprey is currently listed as protected status – their conservation should still be prioritized due to their cultural value. Transportation project managers should consult and collaborate with Tribes to build awareness and understanding of how the traditional, cultural or religious significance of all impacted species can be incorporated into planning processes.

For transportation projects the Federal Highway Administration (FHWA) determines whether their actions may affect any of those species or their critical habitat. If no species or their critical habitats are affected, no further consultation is required. If they may be affected, consultation with the U.S. Fish and Wildlife Service is required. This consultation will conclude either informally with written concurrence from the U.S. Fish and Wildlife Service or through formal consultation with a biological opinion provided and recommendations to avoid or minimize adverse effects to proposed species or proposed critical habitat.<sup>7</sup>

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<sup>7</sup> Refer to the AASHTO Practitioner’s Handbook for Complying with Section 7 of the Endangered Species Act for Transportation Projects (November 2016) for an overview and advice on carrying out Section 7 consultation for transportation projects.

**Table 1 Threatened and endangered vertebrate species potentially occurring in the RTP planning area as of June 2018<sup>1</sup>**

Common name	Scientific name	State status	Federal status
<b>FISH</b>			
Bull trout	<i>Salvelinus confluentus</i>		T
Chinook Salmon, Lower Columbia River	<i>Oncorhynchus tshawytscha</i>		T
Chinook Salmon, Snake River (Fall)	<i>Oncorhynchus tshawytscha</i>	T	T
Chinook Salmon, Snake River (Spring/Summer)	<i>Oncorhynchus tshawytscha</i>	T	T
Chinook Salmon, Upper Columbia River (spring)	<i>Oncorhynchus tshawytscha</i>		T
Chinook Salmon, Upper Columbia River Spring	<i>Oncorhynchus tshawytscha</i>		E
Chinook Salmon, Upper Willamette River	<i>Oncorhynchus tshawytscha</i>		T
Chum Salmon, Columbia River	<i>Oncorhynchus keta</i>		T
Coho Salmon, Lower Columbia River	<i>Oncorhynchus kisutch</i>	E	T
Coho Salmon, Oregon Coast	<i>Oncorhynchus kisutch</i>		T
Pacific Eulachon/Smelt (Columbia River Smelt), Southern DPS	<i>Thaleichthys pacificus</i>		T
Sockeye Salmon, Snake River	<i>Oncorhynchus nerka</i>		E <sup>1</sup>
Steelhead, Lower Columbia River	<i>Oncorhynchus mykiss</i>		T
Steelhead, Middle Columbia River	<i>Oncorhynchus mykiss</i>		T
Steelhead, Snake River	<i>Oncorhynchus mykiss</i>		T
Steelhead, Upper Columbia River	<i>Oncorhynchus tshawytscha</i>		T
Steelhead, Upper Willamette River	<i>Oncorhynchus mykiss</i>		T
<b>AMPHIBIANS AND REPTILES</b>			
Oregon Spotted Frog	<i>Rana pretiosa</i>		T
<b>BIRDS</b>			
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	T	T
Northern Spotted Owl	<i>Strix occidentalis caurina</i>	T	T
Streaked Horned Lark	<i>Eremophila alpestris strigata</i>		T
Yellow-billed Cuckoo (Western DPS)	<i>Coccyzus americanus</i>		T
<b>MAMMALS</b>			
Columbian White-tailed Deer (Columbia River DPS)	<i>Odocoileus virginiana leucurus</i>		E
Gray Wolf	<i>Canis lupus</i>		E <sup>2</sup>
Red Tree Vole (North Oregon Coast DPS)	<i>Arborimus longicaudus</i>		C

\* Listed under the Oregon Endangered Species Act (ORS 496.171 through 496.192) Revised October 2021

Source: Oregon Department of Fish and Wildlife Threatened, Endangered, and Candidate Fish and Wildlife Species in Oregon

T = Threatened, E = Endangered, C = Candidate, DPS = Distinct Population Segment

(1) Many or most of these species have cultural significance to Tribes.

(2) A small remnant run of the historical population migrates through the Columbia River.

(2) The gray wolf is protected as endangered under the authority of the federal Endangered Species Act in Oregon west of Highways 395, 78, and 95.

Project managers should check in with ODFW or NOAA Fisheries when project planning is initiated to ensure the most current status.<sup>8</sup>

All federally listed plant species occurring in Oregon are administratively protected by the State of Oregon. At least the following plants occurring in the Portland metropolitan region are federally Threatened or Endangered at the state of Oregon or federal level (more are listed as federal or state Species of Concern):

- Golden paintbrush – federally Threatened, state Endangered (limited re-introductions have taken place in Oregon)
- White-rock (pale) larkspur (*Delphinium leucophaeum*) – State Endangered
- Peacock larkspur (*Delphinium pavonaceum*) – State Endangered
- Willamette Valley daisy (*Engeron decumbens*) – Federally and state Endangered
- Water howellia (*Howellia aquatilis*) – Federally and state Threatened
- Bradshaw’s lomatium (*Lomatium bradshawii*) – Federally and state Endangered
- Kincaid’s lupine (*Lupinus sulphureus* ssp. *kincaidii* (=oreganus)) – Federally and state Threatened
- White-topped aster (*Sericocarpus rigidus*) – State Threatened
- Nelson’s sidalcea (*Sidalcea nelsoniana*) – Federally and state Threatened

## 1.2 Regulations, ordinances, and permit actions

Principal regulations, ordinances and permit actions that could apply to implementation of transportation projects are summarized in **Table 2**. Many of the laws, requirements and processes are addressed in detail during the project development design and permitting phase after selection of a preferred alternative, as part of the environmental and land use review, consultation and permitting processes all construction projects must undergo.

There are several important federal and state environmental laws related to biodiversity conservation, such as the Clean Water Act, which specifically mandates water quality and

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<sup>8</sup> Oregon Department of Fish and Wildlife:

[https://www.dfw.state.or.us/wildlife/diversity/species/docs/Threatened\\_and\\_Endangered\\_Species.pdf](https://www.dfw.state.or.us/wildlife/diversity/species/docs/Threatened_and_Endangered_Species.pdf)

Refer to Appendix E of the Regional Conservation Strategy for information about sensitive species that are not currently formally listed as threatened and endangered (for example, the Bald Eagle has been de-listed). These species (as of 2018) are classified under the ESA as either Endangered, Listed Endangered, Threatened, Listed Threatened, Proposed Endangered, Proposed Threatened, Candidate, or a Species of Concern. This list includes all known native vertebrate species (and nonnative vertebrate species with established breeding populations) that currently exist within the greater Portland region for at least a portion of the year. Vagrant species (those that do not typically occur every year) are not included on this list. The species list is based on the opinion of more than two-dozen local wildlife experts.

wetland protection, and the Endangered Species Act, which was designed to protect and recover imperiled species and the ecosystems on which they depend.

Early consideration of environmental impacts in the planning stage helps address National Environmental Policy Act (NEPA) requirements more effectively when federal funding or federal action is involved than if such issues would be left for consideration later in the project development process.

The Federal Highway Administration keeps information on legislation, regulations and guidance in an Environmental Review Toolkit which provides a one-stop-shop for questions on process and requirements.<sup>9</sup>

**Table 2 Environmental Laws, Regulations and Permit Requirements**

Law/ Regulation/ Permit	Responsible Agency	Documentation or Processes Required	Regulated Resource(s)
<b>Federal</b>			
National Environmental Policy Act (NEPA)	Federal Transit Administration (FTA) and Federal Highway Administration (FHWA)	NEPA Finding of No Significant Impact (FONSI), Categorical Exclusion (CE), Environmental Assessment (EA) or Environmental Impact Statement (EIS) addressing natural resource conditions, impacts and mitigation	Human and natural environment, and related social and economic effects
Clean Air Act, 1990 Clean Air Act Amendments; (40 CFR Parts 51 and 93)	Environmental Protection Agency (EPA), Federal Transit Administration (FTA) and Federal Highway Administration (FHWA)	Approved transportation conformity determinant with concurrence from the EPA; the region is no longer subject to transportation conformity as of October 2, 2017, when the region completed its obligations under the second 10-year maintenance plan	Air quality (regulating criteria pollution from mobile sources)
Clean Water Act (CWA), Section 404 Individual Permit	U.S. Army Corps of Engineers (USACE)	Alternatives analysis; wetland delineation study; wetland functional assessment and impact analysis; mitigation plan	Waters of the U.S., including wetlands

<sup>9</sup> FHWA Environmental Review Toolkit. [https://www.environment.fhwa.dot.gov/env\\_initiatives/ecological.aspx#:~:text=The%20Eco%2DLogical%20approach%20organizes,programmatic%20approaches%20to%20recurring%20natural](https://www.environment.fhwa.dot.gov/env_initiatives/ecological.aspx#:~:text=The%20Eco%2DLogical%20approach%20organizes,programmatic%20approaches%20to%20recurring%20natural)



Law/ Regulation/ Permit	Responsible Agency	Documentation or Processes Required	Regulated Resource(s)
Clean Water Act (CWA), Section 402 National Pollution Discharge Elimination System (NPDES) permit	Oregon Department of Environmental Quality, as authorized by the Federal government	Site specific data for construction projects on 1 or more acre	Waters of the U.S., including wetlands
Pre-Construction Assessment for in-water work	U.S. Army Corps of Engineers (USACE) and Oregon Department of State Lands	Assessment describing preferred timing window for work and other stipulations	Waters of the U.S., aquatic species, and habitat
Endangered Species Act (ESA) and Magnuson-Stevens Fishery Conservation Management Act, Section 7 consultation	National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), Federal Highways Administration (FHWA)	Biological Assessment addressing project impacts to listed species, species proposed for listing and candidate species provided by US Fish and Wildlife Service or National Marine Fisheries Service	Threatened and endangered and sensitive vegetation, wildlife, fisheries
Fish and Wildlife Coordination Act	US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS) and Oregon Department of Fish and Wildlife (ODFW)	Agency consultation; identify impacts to fish and wildlife resources; recommend mitigation	Vegetation, wildlife, fisheries
Federal Migratory Bird Treaty Act; "take" permits	US Fish and Wildlife Service (USFWS)	Identify impacts to migratory birds; avoid destruction of active nests or eggs, and killing of individuals	Wildlife
Bald Eagle and Golden Eagle Protection Act	US Fish and Wildlife Service (USFWS)	Identify bald eagle nesting habitats; agency consultation	Wildlife
Section 4(f) of the Department of Transportation Act (1966)	Federal Transit Administration (FTA) and Federal Highway Administration (FHWA)	Conduct 4(f) review and document no feasible and prudent avoidance alternative and include all possible planning to minimize harm	Publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites
National Historic Preservation Act (NHPA)	National Parks Service, State Historic Preservation Office	Section 106 review process to consider the effect a project may have on historic places	Historic places <sup>10</sup>

<sup>10</sup> National Register Bulletin. How to Apply the National Register Criteria for Evaluation [https://www.nps.gov/subjects/nationalregister/upload/NRB-15\\_web508.pdf](https://www.nps.gov/subjects/nationalregister/upload/NRB-15_web508.pdf)

<b>Law/ Regulation/ Permit</b>	<b>Responsible Agency</b>	<b>Documentation or Processes Required</b>	<b>Regulated Resource(s)</b>
Flood Insurance Reform Act, National Flood Insurance Program	Federal Emergency Management Agency (FEMA)		
36 CFR Part 800 – Protection of Historic Properties			
American Indian Religious Freedom Act of 1978			
Antiquities Act of 1906			
Archeological Resource Protection Act of 1979			
Archeological and Historical Preservation Act of 1974			
Native American Graves Protection and Repatriation Act			
Executive Order No. 13007 Indian Sacred Sites			
Executive Order No. 12898 Environmental Justice			
Executive Order No. 11593 Protection and Enhancement of the Cultural Environment			
Section 4(f) of the Department of Transportation Act of 1966			
<b>State</b>			
Statewide Planning Goal 5			

Law/ Regulation/ Permit	Responsible Agency	Documentation or Processes Required	Regulated Resource(s)
Oregon Removal – Fill Permit	Oregon Department of State Lands (DSL)	Alternatives analysis; wetland and/or waterway delineation study; wetland and/or waterway functional assessment and impact analysis; mitigation plan for removal or filling in waters of the state	Waters of the state, including wetlands
Oregon State Endangered Species Act (ESA)	Oregon Department of Fish and Wildlife (ODFW) and Oregon Department of Agriculture (ODA)	Identify project impact to state-listed and candidate species not currently listed under federal ESA	Vegetation, wildlife, fisheries
Clean Water Act (CWA) Section 401 Water Quality Certification	Oregon Department of Environmental Quality (DEQ)	Assess project compliance with state water quality standards; implement mitigation measures; issued in conjunction with the Corps Clean Water Act, Section 404 permit	Rivers, streams, other bodies of water
Oregon Fish and Wildlife Habitat Mitigation Policy	Oregon Department of Fish and Wildlife (ODFW) (reviews other agency permits and makes recommendations)	Evaluate the potential impact of development actions on fish and wildlife habitat; follow guidelines to reduce, offset, or avoid the impact on fish and wildlife habitat	Wildlife and fish habitat
Oregon Fish Passage Act <sup>11</sup> consultation and approval	Oregon Department of Fish and Wildlife (ODFW)	Agency consultation; identify crossed streams with native migratory fish (or history of); implement passage at identified streams	Native migratory fish <sup>12</sup>

<sup>11</sup> The Oregon Fish and Wildlife Commission adopted new fish passage administrative rules on December 16, 2022. These new rules take effect January 1, 2023. These new fish passage administrative rules are intended to provide clarity to the public and owners and operators of fish passage barriers or "Artificial Obstructions". The rules also close loopholes around fish passage triggers for existing dams, incorporate multi-species needs, update fish passage design criteria and provide more fish passage design alternative solutions, improve ODFW Program efficiency, better align state and federal stream simulation culvert design standards and compel designers to consider future climate changing conditions into design alternatives and engineering analyses.

These new rules take effect January 1, 2023 and can be found on the Oregon Secretary of State's Office administrative rule website located at: <https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=2988> .

<sup>12</sup> "Native migratory fish" means naturally or hatchery produced native fish (as defined under OAR 635-007-0501) indigenous (i.e., not introduced) to Oregon that migrate for their life cycle needs. These fish include all sub-species and life history patterns of the following species listed by scientific name in use as of 2022. Common names are provided for reference but are not intended to be a complete listing of common names, sub-species, or life history patterns for each species. <https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=2988>

Law/ Regulation/ Permit	Responsible Agency	Documentation or Processes Required	Regulated Resource(s)
State of Oregon Archaeological Permits	Oregon State Historic Preservation Office	For any excavation in known archeological sites or for exploratory excavations to determine if archeological deposits are present in lands owned by local or state agencies	Historic and archeologically significant sites
National Flood Insurance Program (NFIP) in Oregon	Department of Land Conservation and Development	Permits and regulations apply to real estate, which could apply to some transportation related structures; applies to governments enrolled in the program	Designated Special Flood Hazard Areas
ORS 97.740-97.760 Indian Graves and Protected Objects			
ORS 192.345 (11) Public Records Conditionally Exempt from Disclosure			
ORS 358.653 Protection of Publicly Owned Historic Properties			
ORS 358.905-358.961 Archeological Objects and Sites			
ORS 390.805-390.925 Scenic Waterways			

Under Oregon land use regulations, local and state jurisdictions are required to compile inventories of wetland and other natural areas and protect the highest-ranking inventoried sites. This protection is provided by local regulations such as local environmental zones, sensitive lands overlay zones and other locally identified regulated areas and resources. Such areas include sites that meet the standards of Statewide Planning Goal 5 for open space, scenic or natural values.

### 1.3 2040 Growth Concept, and Title 3 and Title 13

Metro meets the requirements of Statewide Planning Goal 5 through Title 3: Water Quality And Flood Management and Title 13 of the [Urban Growth Management Functional Plan](#).<sup>13</sup>,<sup>14</sup> Title 3 of the Urban Growth Management Functional Plan applies to development in water quality resource and flood management areas and was adopted in 1997. Title 3 includes the Metro Water Quality and Flood Management Area Map and a model ordinance. The purpose of Title 3 is to protect the beneficial water uses and functions and values of resources within the water quality and flood management areas by avoiding, minimizing, or mitigating the impact on these areas from development activities.<sup>15</sup> Cities and counties comply with Title 3 in their comprehensive plans and implementing ordinances.

Through Title 13, Metro developed the Regionally Significant Fish and Wildlife Habitat Inventory Map and the Habitat Conservation Areas Map, which were adopted by the Metro Council in 2005.<sup>16</sup> Title 13 includes requirements for conserving, protecting, and restoring habitat conservation areas and habitats of concern but does not outright prohibit development in these areas. In adopting Title 13, the Metro Council chose to rely on a combination of land use protections designed to conserve the highest value habitats and voluntary measures to be implemented by public and private partners.<sup>17</sup> As of December 2022, all cities and counties were in compliance with Title 13. Local jurisdictions have adopted Title 13 maps and use the policy to issue permits for development.<sup>18</sup>

In general, the overlay zones are intended to allow development in situations where adverse impacts from the development cannot be avoided. Regulations implementing these ordinances provide requirements for, among other things, identifying, protecting, and mitigating impacts, and managing important natural resources. Each jurisdiction has its own process for assessment and approval of transportation projects in the vicinity of

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<sup>13</sup> Title 3 and 13 data was compiled in the early 2000s. Since that time geographic information system tools have improved and new data has been made available through a variety of efforts and agencies, including the Regional Conservation Strategy (which Metro and some local agencies have been actively involved) and the Oregon Conservation Strategy. In response to public comments received during the final comment period and consultation process, Metro used Title 3 and Title 13 data as well as the data developed by the Regional Conservation Strategy and state and federal resource agencies.

<sup>14</sup> Link to UGMFP: <https://www.oregonmetro.gov/sites/default/files/2018/04/16/urban-growth-management-functional-plan-04162018.pdf>

<sup>15</sup> Title 3 map available from Metro in RLIS <http://rlisdiscovery.oregonmetro.gov/?action=viewDetail&layerID=2116#> and on Data Basin <https://databasin.org/datasets/88691cc47cbd4992838864c29dbb147f>

<sup>16</sup> The inventory and maps includes lands along local rivers and streams and significant fish and wildlife habitat areas. No changes have been made to the maps since adoption in 2005.

<sup>17</sup> Title 13 of the Urban Growth Management Functional Plan (Sections 3.07.1310 – 3.07.1370). <https://www.oregonmetro.gov/urban-growth-management-functional-plan>

<sup>18</sup> Title 13 inventory and map are available on Data Basin <https://databasin.org/datasets/afdbf390255549418f26855af59b2f79> and Metro RLIS <http://rlisdiscovery.oregonmetro.gov/?action=viewDetail&layerID=2087#>

sensitive ecosystem resources. The processes include an assessment of existing conditions, analysis of potential impacts from a project, and documentation of actions taken to avoid, minimize or compensate for impacts to the resources. In addition, each jurisdiction has local requirements for storm water management and treatment, and many have urban forestry or tree code requirements designed to conserve tree canopy.

#### **1.4 ODOT Environmental Performance Standards and Technical Guidance**

ODOT has developed technical guidance for environmental performance standards for designing and constructing state highway construction projects, including local agency highway construction projects funded by ODOT.<sup>19</sup> The standards were developed as required by Section 18 of the Jobs and Transportation Act enacted by the 2009 Oregon Legislature. The documents defines environmental performance standards as the “acceptable levels of environmental performance specified for the projects activities.” Levels of environmental performance can range from high-level environmental standards (avoid or minimize) down to more specific quantitative criteria required by permit condition.

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<sup>19</sup> ODOT Project Delivery Operational Notice PD-04. Jobs and Transportation Act (JTA) Section 18 Environmental Performance Standards and Technical Guidance. May 13, 2013. Prepared by ODOT JTA Steering and Working Teams.

## Section 2. Environmental Assessment

Considering the complexity and diversity of the environment across the region, Metro used readily available and best available published data for the environmental assessment. Attachment 4 provides a list of projects in the RTP and identifies which environmental and historical resources the project intersects with.

### 2.1 Indigenous Knowledges and Tribal Approaches to Environmental Protection

**Note: Metro staff invite consultation, suggestions and recommendations to include TEK, Tribal priorities, strategies, Tribal-led efforts or other resources in this section.**

Tribes are leaders in the fields of environmental protection, mitigation and conservation. Transportation agencies are encouraged to learn about the frameworks, strategies and world views utilized by Tribes to advance this work.

Transportation agencies are also encouraged to respectfully engage with interested Tribes to learn about and co-create approaches for how Tribe-specific Traditional Ecological Knowledge or Indigenous Knowledge developed over millennia of relationship between Tribes and the land and resources can be incorporated into planning processes, where appropriate.

The White House Office of Science and Technology Policy (OSTP) and the White House Council on Environmental Quality (CEQ) have issued a memorandum to recognize Indigenous Knowledge – also known as Traditional Ecological Knowledge – as one of the many important bodies of knowledge that contributes to the scientific, technical, social, and economic advancements of the United States and to our collective understanding of the natural world in decision-making.

### 2.2 Environmental resources and mitigation areas of importance

Metro, in consultation with Federal, State, and Tribal land management, wildlife, and regulatory agencies, and Metro Parks and Nature staff, identified the areas listed below to address in the environmental assessment.

1. Water and fish
2. High value habitat and connectivity
3. Floodplains and flood hazard areas
4. Tribal lands
5. Historic places
6. Urban heat islands

## 2.3 Summary of environmental assessment

The negative effect that transportation infrastructure has on the health of the natural environment, particularly urban waterways and habitat connectivity, is well documented. Transportation infrastructure has the potential to degrade water quality, create barriers to corridors for animal travel and increase air, noise and light pollution. Projects also have the potential to negatively impact cultural and historical resources if not planned and implemented carefully.

As shown in the following sections, hundreds of transportation projects, ranging from new roadways and bridges to improvements to pedestrian, bicycle and freight connections, may intersect with vegetation, aquatic, and terrestrial wildlife species and habitat, wetlands, floodplains, and other biological, tribal, and historic resources.

Only capital projects were included in the analysis. A capital project is a project to construct either new facilities or make significant, long-term renewal improvements in programs or to existing facilities. Out of the 1,068 projects in the RTP project list, 937 were included in the analysis, while 137 projects did not meet the spatial criteria to be included. Of the 937 capital projects included in the analysis, 657 projects intersected with one or more of the environmental areas of concern.

The environmental concern areas with the highest percentage of intersecting projects (77% of capital projects) are Urban Heat Islands and areas with Potentail Habitat Connectivity; after those areas, Title 13 Habitat Conservation Areas and Regional Conservation Strategy High Value Habitat Areas have the highest percentage of intersecting capital projects. Seventy percent of the projects intersecting one or more area of environmental concern are in Equity Focus Areas. No one project intersects with every environmental concern area.

### 2.3.1 Water and fish

All living things need clean water to survive. Several major rivers in the region, including the Clackamas, Columbia, Lewis, Molalla, Salmon, Sandy, Tualatin, Washougal, and Willamette, have thousands of tributaries and numerous associated wetlands and lakes, as well as floodplains and bottomland habitat. Collectively, these water features contribute enormous value to biodiversity in the region. Coho salmon continue to spawn in area streams, despite many challenges, as they have for thousands of years. An increase in impermeable surfaces and transportation related pollutants increases stormwater runoff quantity and degradation of water quality. Fish passage in rivers and streams is blocked by culverts, dams, bridges, and other barriers.



Recent research<sup>20</sup> attributed coho salmon death to an acutely toxic chemical degradation product (6PPD-quinone) from tire particles in stormwater. Concentrations in stormwater were found to be lethal for coho following exposures lasting only a few hours. Additional (forthcoming) research has shown that steelhead are vulnerable, and other species of ESA-listed salmonids tested (e.g., Chinook), are also affected. More recently, the Tian et al. team published that 6PPD-Q also was 8.3 times more toxic than previously calculated and should be categorized as a “very highly toxic” pollutant for aquatic organisms.<sup>21</sup> 6PPD-quinone is acutely toxic to coho salmon, is ubiquitous in tires, and no substitute has been identified yet. However, Green Stormwater Infrastructure (GSI) is effective at reducing mortality rates for coho exposed to stormwater, and relatively inexpensive mitigation measures like bioswales can dramatically improve water quality and promote salmon survival.<sup>22</sup> Stormwater is an extremely complex chemical mixture, and 6PPD is only one of many stormwater contaminants.<sup>23</sup> There are thousands of chemicals in road runoff (including PAHs, metals, pharmaceuticals, pesticides, and other contaminants of emerging concern), many of which are uncharacterized and have the potential to be toxic.

With respect to runoff quantity, development in the region at increasing density results in less pervious surface available to absorb the combined runoff volumes from transportation surfaces, structures and associated impervious area. Runoff volumes of winter peak flows can more than double from predeveloped conditions in the face of urban development, with associated flow reductions in summer. Climate change is expected to reinforce this pattern. Higher runoff volumes result in channel erosion, aquatic and floodplain habitat degradation, and damage to infrastructure (including transportation infrastructure such as bridges and culverts). Low summer flows reduce the vigor of vegetation that helps stabilize streambanks. Yet more than half of the region, including nearly all the area west of the Willamette River, has subsurface conditions that do not promote easy infiltration of large volumes of urban runoff.

The assessment identifies RTP projects that intersect with or fall within a 100-foot buffer of fish bearing streams, barriers to fish passage, Title 3 lands, and wetlands in the greater Portland region. Data used in the analysis is listed in **Table 12**.

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<sup>20</sup> Published in the journal Science and authored by Puget Sound scientists, (Tian et al., 2021).

<https://www.science.org/doi/10.1126/science.abd6951>

<sup>21</sup> (Tian et al., 2022). <https://pubs.acs.org/doi/10.1021/acs.estlett.1c00910>

<sup>22</sup> (Spromberg et al., 2016). <https://besjournals.onlinelibrary.wiley.com/doi/pdfdirect/10.1111/1365-2664.12534>

<sup>23</sup> (Du et al., 2020). <https://pubs.acs.org/doi/abs/10.1021/acs.estlett.0c00749>

**Table 3 Projects intersecting water and fish habitat**

Environmental Concern Area Name	# of projects	% of projects
All Fish-Bearing Streams	262	40%
Fish Passage Barriers	180	27%
Title 3 Land	350	53%
Wetlands	349	53%

*Note: Maintenance and operations projects are excluded from the analysis. Analysis is for projects on the fiscally constrained list of projects, of the 1,066 projects on the list, 655 capital projects were analyzed.*

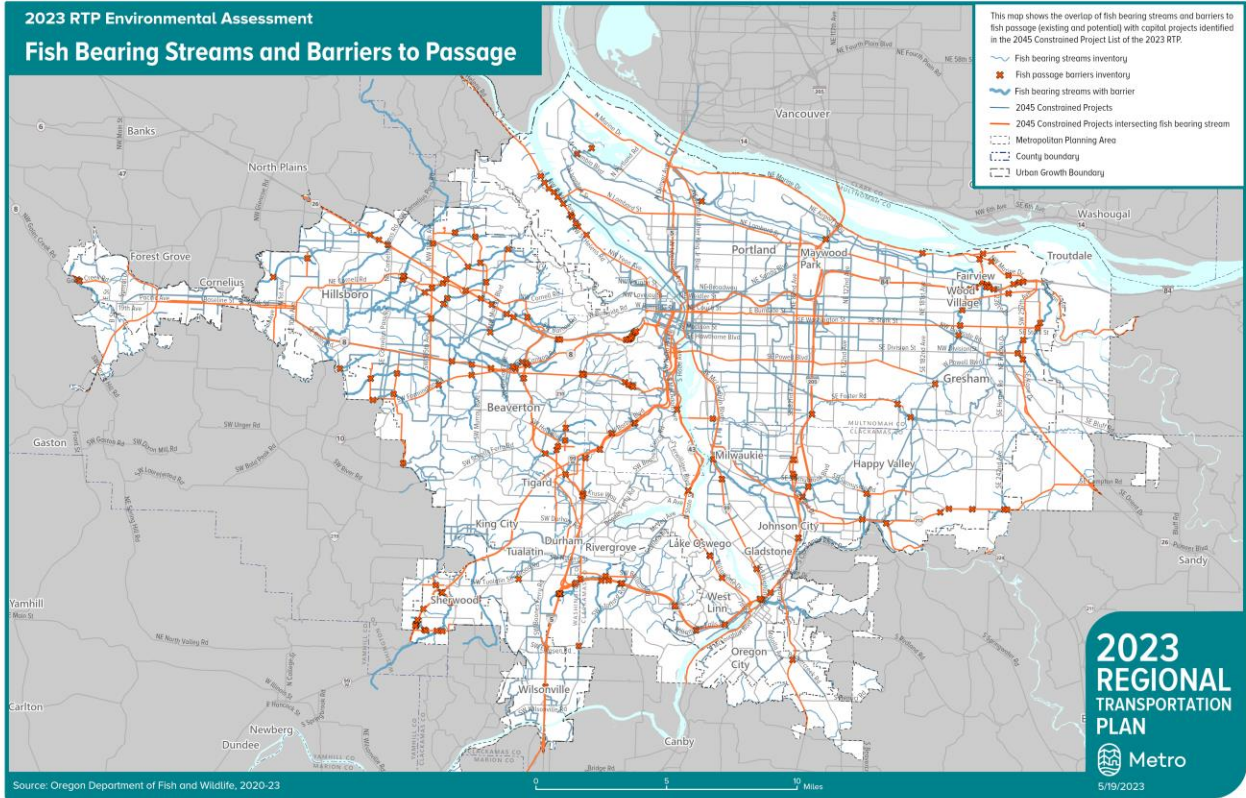
**The analysis shows that 262, or 40%, of capital projects intersect with fish-bearing streams, including essential salmonoid habitat (ESH),** using Oregon Fish Habitat Distribution Data, describe areas of suitable habitat believed to be used currently or historically by native or non-native fish populations. The term "currently" is defined as within the past five reproductive cycles. Historical habitat includes suitable habitat that fish no longer access and will not access in the foreseeable future without human intervention.<sup>24</sup> Of the 262 projects intersecting with fish-bearing streams, 202 of the projects intersect with streams identified as salmon habitat. Major capital projects estimated to cost \$100 million or more and intersecting salmon-bearing streams are listed in Table 4. The 2023 [Essential Salmonoid Habitat map tool](#) provided by the Department of State Lands, shows the rivers and streams in the planning area that are essential salmonoid habitat.<sup>25</sup>

<sup>24</sup> This information is based on sampling, the best professional opinion of Oregon Dept. of Fish and Wildlife or other natural resources agency staff biologists or modeling (see the fhdBasis field). Due to natural variations in run size, water conditions, or other environmental factors, some habitats identified may not be used annually. These data now comply with the Oregon Fish Habitat Distribution Data Standard that was adopted by the Oregon Geographic Information Council in April 2020. The Standard document can be found at: [https://www.oregon.gov/geo/standards/OregonFishHabitatDistributionDataStandard\\_v4.pdf](https://www.oregon.gov/geo/standards/OregonFishHabitatDistributionDataStandard_v4.pdf). Historical habitat distribution data are within the scope of the standard and are identified via the habitat use (fhdUseType) attribute. Historical habitats are only identified outside of currently accessible habitat and are not comprehensive. Data representing current habitat for anadromous and resident salmonid species are generally more comprehensive than data for non-game and non-native fish species. All datasets are subject to update as new information becomes available. Key features of the Oregon Fish Habitat Distribution Data include: species, run, life history, habitat use, origin, production, the basis for each record, originator name, originator entity and reference. Habitat distribution data are mapped at a 1:24,000 scale statewide and are based on the National Hydrography dataset. The data are made available as GIS files in both shapefile and ESRI geodatabase format. The data were developed over an extensive time period ranging from 1996 to 2022. The data are now managed on the National Hydrography Dataset and have been synchronized to December 2021 NHD geometry.

<https://nrimp.dfw.state.or.us/DataClearinghouse/default.aspx?p=202&XMLname=1167.xml>

<sup>25</sup> Available at: Essential Salmonoid Habitat map, Department of State Lands, <https://maps.dsl.state.or.us/esh/>

**Figure 1 Fish Bearing Streams and Barriers to Fish Passage Map**



**Table 4 Major capital projects intersection salmon-bearing streams**

<b>Project Name</b>	<b>RTP ID</b>	<b>RTP Investment Category Group</b>	<b>Estimated cost (in YOE dollars)</b>
HCT: Steel Bridge Transit Bottleneck Capital Construction	10921	Transit Capital	\$ 5,696,000,000
OR 212/224 Sunrise Project Phase 3	12020	Throughways	\$ 939,000,000
OR 217 Capacity Improvements	11582	Throughways	\$ 814,000,000
Earthquake Ready Burnside Bridge: Phase 3 (Construction)	12076	Roads and Bridges	\$ 767,200,000
I-5 Boone Bridge and Seismic Improvement: SB Wilsonville Rd to Wilsonville-Hubbard Hwy (UR, CN, OT)	11990	Throughways	\$ 670,000,000
I-205 Southbound and Northbound Widening and I-205 Toll Project (UR, CON, OT)	11904	Throughways	\$ 557,000,000
I-205 Abernethy Bridge (CON)	11969	Roads and Bridges	\$ 545,000,000
I-5 and I-205: Regional Mobility Pricing Project (PE, RW, UR, CN, OT)	12304	Throughways	\$ 400,000,000
I-5 Freight Operational Improvements	11991	Throughways	\$ 358,000,000
OR 212/224 Sunrise Hwy Phase 2: SE 122nd to SE 172nd (CON)	11301	Throughways	\$ 331,000,000
I-5/99W Connector Southern Arterial (ROW and Construction)	10598	Roads and Bridges	\$ 318,900,000
HCT: 82nd Ave Transit Project	12029	Transit Capital	\$ 300,000,000
HCT: Tualatin Valley Highway Transit Project	11589	Transit Capital	\$ 300,000,000
I-5/99W Connector Southern Arterial Widening	11340	Roads and Bridges	\$ 232,300,000
OR 217 Southbound Braided Ramps Beaverton-Hillsdale Hwy to Allen Blvd	11988	Throughways	\$ 203,000,000
HCT: Beaverton-Hillsdale Highway Corridor High Capacity Transit	12290	Transit Capital	\$ 162,700,000
HCT: Burnside/Stark Corridor High Capacity Transit	12286	Transit Capital	\$ 162,700,000
HCT: Lombard/Cesar Chavez Corridor High Capacity Transit	12288	Transit Capital	\$ 162,700,000
HCT: Martin Luther King Corridor High Capacity Transit	12287	Transit Capital	\$ 162,700,000
HCT: SW 185th Corridor High Capacity Transit	12289	Transit Capital	\$ 162,700,000
82nd Ave Corridor Improvements	11844	Roads and Bridges	\$ 150,000,000
OR 217 Interchange, Safety, and Operational Improvements	11978	Throughways	\$ 148,000,000

Project Name	RTP ID	RTP Investment Category Group	Estimated cost (in YOE dollars)
Earthquake Ready Burnside Bridge: Phase 2 (Design)	11376	Roads and Bridges	\$ 127,600,000
HCT: Sunset Highway High Capacity Transit	11912	Transit Capital	\$ 113,900,000

*Note: Maintenance and operations projects are excluded from the analysis. Analysis is for projects on the fiscally constrained list of projects, of the 1,066 projects on the list, 655 capital projects were analyzed.*

**The analysis shows that 180, or 27%, of capital projects on the financially constrained list intersect with fish passage barriers, or streams that are used for fish passage,** using the Oregon Fish Passage Barriers Data (OFPBDS).<sup>26</sup> These are barriers of any type, including The [Fish Habitat Distribution and Barriers map tool](#) provides an interactive platform to explore the location of barriers within the planning area.<sup>27</sup>

Five projects on the financially constrained list intersect with Priority Barriers identified in the OFPBDS data. The projects are listed in Table 5. There are only a handful of Priority Barriers in the planning area. Two of the projects, RTP 10101 and 11673, identify elements to improve and restore fish passage. Other projects that include fish passage in the project description (though do not cross Priority Barriers) are RTP ID 10399 and 10389.

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<sup>26</sup> This dataset is intended to support the need for accurate, current and complete representation of the fish passage barriers affecting fish migration throughout the state of Oregon. The OFPBDS database is the most comprehensive compilation of fish passage barrier information in Oregon however, it does not represent a complete and current record of every fish passage barrier within the state. Efforts to address deficiencies in data currency, completeness and accuracy are ongoing. The Oregon Fish Passage Barrier Data Standard (OFPBDS) provides a consistent and maintainable structure for both producers and users of fish passage barrier data.

<https://nrimp.dfw.state.or.us/DataClearinghouse/default.aspx?p=202&XMLname=44.xml>

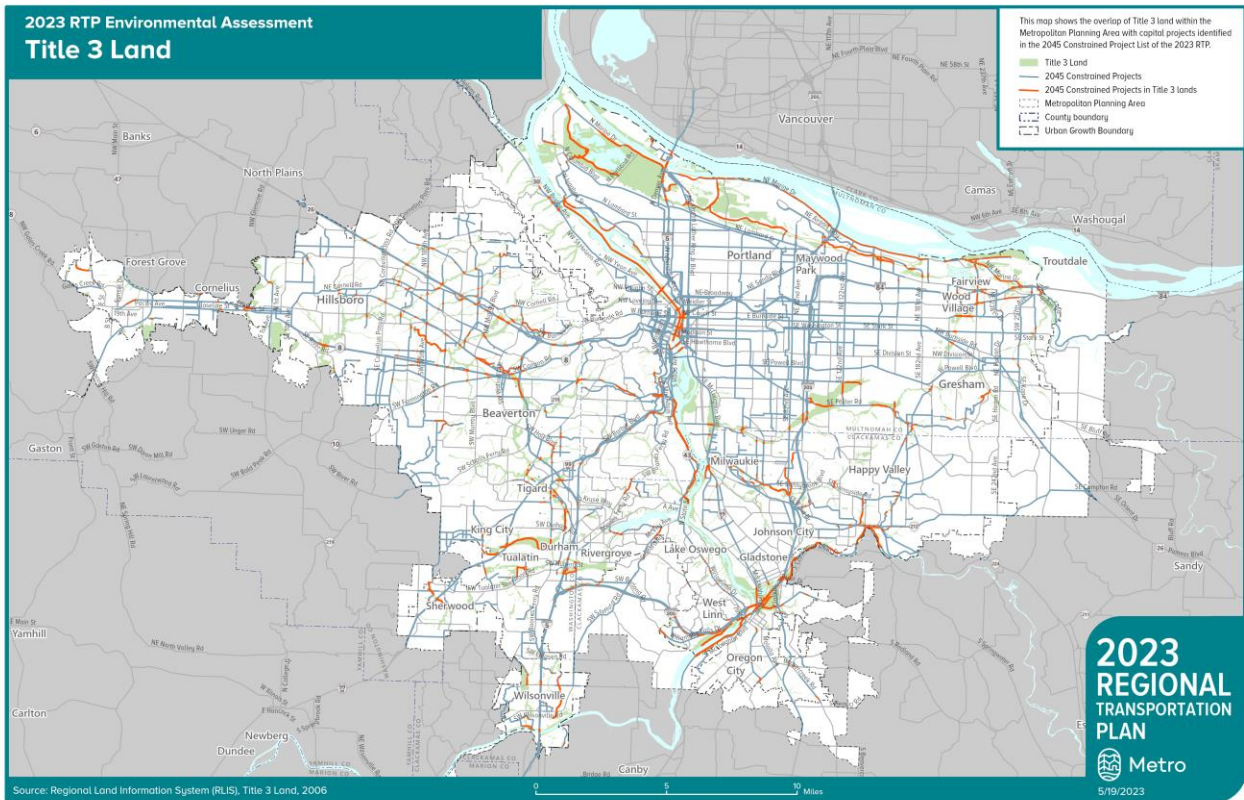
<sup>27</sup> Available at: [https://nrimp.dfw.state.or.us/FHD\\_FPB\\_Viewer/index.html](https://nrimp.dfw.state.or.us/FHD_FPB_Viewer/index.html)

**Table 5 Projects intersecting Priority Barriers for fish passage**

Project Name	RTP ID	Estimated cost (in YOE dollars)
Kellogg Creek Dam Removal and OR 99E Underpass	10101	\$ 40,654,000
Lake Oswego to Portland Trail	10087	\$ 22,800,000
McLoughlin Blvd. Improvement	10024	\$ 8,746,000
Troutdale Road at Beaver Creek: Fish Passage Restoration and Fill Bike and Pedestrian Gap	11673	\$ 11,600,000
Troutdale Road: Bike and Pedestrian Safety Improvements	11674	\$ 12,100,000

**The analysis shows that 350, or 53%, of capital projects on the financially constrained list intersect with Title 3 land.** The [Title 3 Land](#) data delineates places protected by Title 3: Water Quality And Flood Management of the Urban Growth Management Functional Plan, which aims to protect the region's health and public safety by reducing flood and landslide hazards, controlling soil erosion, and reducing pollution of the region's waterways. This data specifically delineates areas impacted by Title 3 for the following purposes: 1. protect against flooding, 2. enhance water quality in the region's streams, rivers, and wetlands, and 3. protect regionally significant fish and wildlife habitat areas.

**Figure 2 Projects intersecting with Title 3 Lands Map**



The analysis shows that 349, or 53%, of capital projects on the financially constrained list intersect with wetlands. Wetlands store even more carbon than forests, and that carbon is much less vulnerable to being released back into the atmosphere during a wildfire. Three wetland inventories were used in the analysis: Local Wetland Inventory (LWI), National Wetland Inventory (NW) and RLIS Wetlands. There is overlap in the inventories, but some wetlands are only represented in one of the three, so all three data are used. RLIS Wetlands capture wetlands not represented in either LWI or NWI, especially along the Columbia River. This method follows that of the Oregon Wetlands Database (2019).<sup>28</sup> This source is a combination of LWI, NWI, and “More Oregon Wetlands (MOW)”. These MOW capture many of the same additional wetlands captured in RLIS Wetlands.

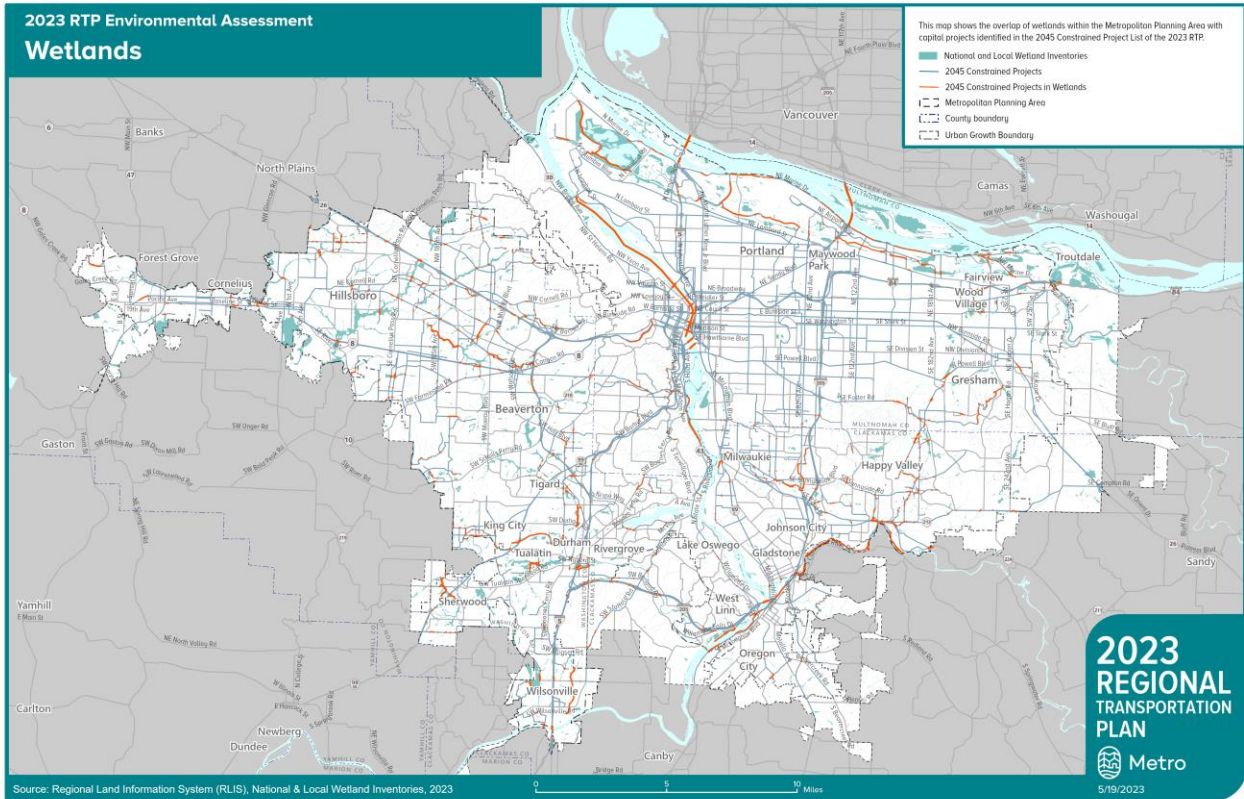
Metro did not include all the areas shown in the [Statewide Wetlands Inventory \(SWI\) tool](#) in the analysis.<sup>29</sup> The tool shows some other natural resource mapping like NHD waters and predominately hydric type soils (“Percent Hydric” greater than 50%). The analysis may

<sup>28</sup> <https://spatialdata.oregonexplorer.info/geoportal/details?id=51b33a5392404b8f83be5a36b5d25e72>

<sup>29</sup> Available at: <https://maps.dsl.state.or.us/swi/> disclaimers and information on how to use the tool are available at: <https://www.oregon.gov/dsl/WW/Pages/SWI.aspx>

include these areas in the future as they may better support the project planning and scoping phase.

**Figure 3 Projects intersecting with Wetlands Map**



### 2.3.2 High value habitat and connectivity

The greater Portland region’s ecosystem provides habitat to hundreds of wildlife species. To help protect these species and the biodiversity of the region, the Intertwine Alliance’s Regional Conservation Strategy identified high value habitat areas.<sup>30</sup> A Regional Connectivity Work Group has recently developed data on habitat connectivity, which are key habitat areas and the best remaining, feasible connections between these “anchor” habitats. The work group has created a Connectivity Toolkit that uses GIS to identify wildlife habitat areas and potential connectivity zones, followed by ground-truthing to assess habitat conditions and potential barriers to wildlife movement.

<sup>30</sup> Regional Conservation Strategy data inventories are compatible with Metro Title 13 Regionally Significant Fish and Wildlife Habitat Inventory and the Habitat Conservation Areas inventories and local jurisdiction Title 13 inventories. Development of the Regional Conservation Strategy inventories used similar techniques as the Title 13 inventories, but benefited from better Geographic Information Systems (GIS), better land cover data and lidar tree canopy. Metro and partners continue to develop new data and inventories, such as White Oak mapping and connectivity corridors mapping that can complement future environmental analysis.



Other natural resource data can be overlain to enrich the Regional Conservation Strategy habitat models for transportation planning. Many of the datasets use similar data that overlap; however, using a variety of data in project planning and scoping ensures that projects are using the best available data, including:

- Essential Salmonid Habitat (ESH)<sup>31</sup>
- Local jurisdiction adopted Title 13 compliant habitat conservation maps;
- Oak Prairie High Priority Area
- Habitat Connectivity (Omniscape)
- Locations of wildlife collisions
- Conservation Opportunity Areas
- Willamette River Greenway Inventory includes fish and wildlife habitat<sup>32</sup>

The assessment identifies RTP projects that intersect with or fall within a 100 foot buffer of sensitive and critical habitat in the greater Portland region. Data used in the analysis is listed in Table 6.

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<sup>31</sup> The ESH dataset is determined by ODFW and stewarded by DSL. The significance is that all ground disturbance within ESH waters and hydrologically connected wetlands requires DSL permits. <https://maps.dsl.state.or.us/esh/> Salmonid critical habitat data available at:

[http://www.westcoast.fisheries.noaa.gov/protected\\_species/salmon\\_steelhead/salmon\\_and\\_steelhead\\_listings/steelhead/lower\\_columbia\\_river/lower\\_columbia\\_river\\_steelhead.html](http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/salmon_and_steelhead_listings/steelhead/lower_columbia_river/lower_columbia_river_steelhead.html)

<sup>32</sup> Willamette River Greenway Inventory <https://www.portlandoregon.gov/bps/article/508803> and Goal 15 Willamette River Greenway <https://www.oregon.gov/LCD/docs/goals/goal15.pdf>

**Table 6 Projects intersecting high-value habitat**

Environmental Concern Area Name	# of projects	% of projects
RCS High Value Habitat Areas	404	61%
Title 13 Habitat Conservation Areas	475	72%
Oak Prairie High Priority Area	313	48%
Potential Habitat Connectivity (Omniscape)	503	77%
Wildlife Collisions (ODOT Highways)	111	17%
Conservation Opportunity Areas	141	21%

*Note: Maintenance and operations projects are excluded from the analysis. Analysis is for projects on the fiscally constrained list of projects, of the 1,066 projects on the list, 655 capital projects were analyzed.*

**The analysis shows that 404, or 61%, of capital projects in the financially constrained list intersect with the top 25 percent of Regional Conservation Strategy (RCS) habitat areas.** The top 25 percent scoring habitat areas inventory are referred to as high-value habitat. High value areas ranked in the top quarter of all areas based on the type, location, and size of their habitat.<sup>33</sup> The RCS habitat model was developed using separate upland and riparian models, which were then combined. Where the two inventories overlapped, high value riparian habitat took precedence. The inventory was based on many sources of data, including:

- 5-meter resolution land cover map developed for this process by the Institute for Natural Resources
- combined national and local wetland inventories (including those identified in the National Wetland Inventory)
- U.S. Geological Survey stream and hydrography data
- SSURGO soil data collected by the National Cooperative Soil Survey developed by the U.S. Department of Agriculture
- LiDAR data and land cover data.
- 100-year floodplains identified by the Federal Emergency Management Agency (FEMA)
- regional data on forest lands, streams, rivers, bodies of water, soil types including hydric soils, existing vegetation, wetlands, habitat patch size and shape, distance from streams and wetlands, and the influence of roads, an estimate of how difficult it is for organisms to move across the landscape, and infiltration potential.

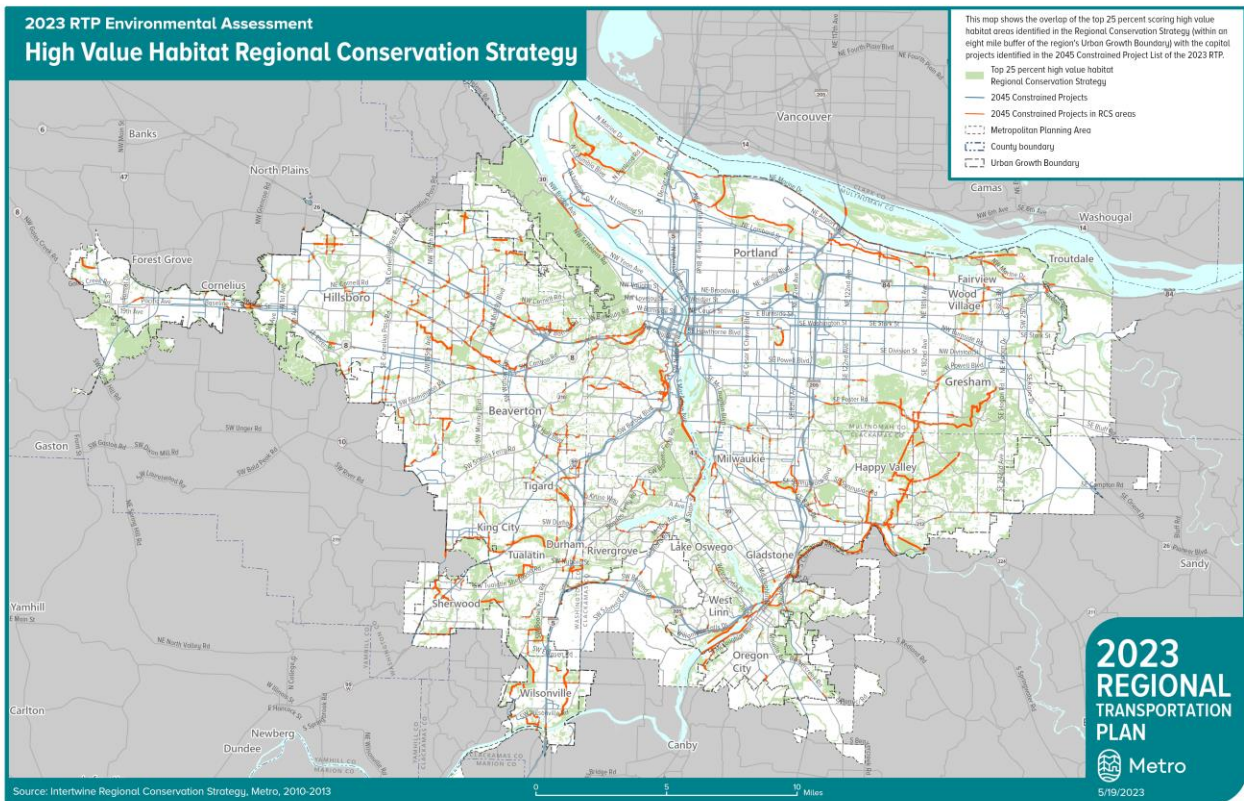
It should be noted that while the Regional Conservation Strategy data made use of the best available data at the time, key elements such as wildlife connectivity, Oregon white oak and

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<sup>33</sup> Regional Conservation Strategy information, mapping tools and data are available at [www.regionalconservationstrategy.org](http://www.regionalconservationstrategy.org)

prairie habitats (an Oregon Conservation Strategy habitat type as well as a Habitat of Concern under Metro’s Title 13) were not available at the time. It is important to consider these two habitat categories because they may not fall within the Regional Conservation Strategy top 25 percent of habitat and transportation infrastructure can interrupt wildlife movement across the landscape. However, these data have since been developed and are included in the analysis.

**Figure 4 Projects intersecting with High Value Habitat RCS Map**



**The analysis shows that 475, or 62%, of capital projects in the financially constrained list intersect with Metro Title 13 data.** Adopted by the Metro Council in 2005, the [Title 13 inventory](#) combines Regionally Significant Riparian & Upland Wildlife habitat, Habitats of Concern, and impact areas into one integrated layer.<sup>34</sup> The Habitat Conservation Areas Layer depicts the Metro Fish and Wildlife regulatory program defined in Exhibit A to Metro Resolution No. 04-3506A. The layer divides the region's significant habitat into high, moderate, low, or no conservation area. Metro established these designations by comparing ecological values to competing development and policy values. Major capital projects estimated to cost \$100 million or more and intersecting Title 13 areas are listed in Table 7.

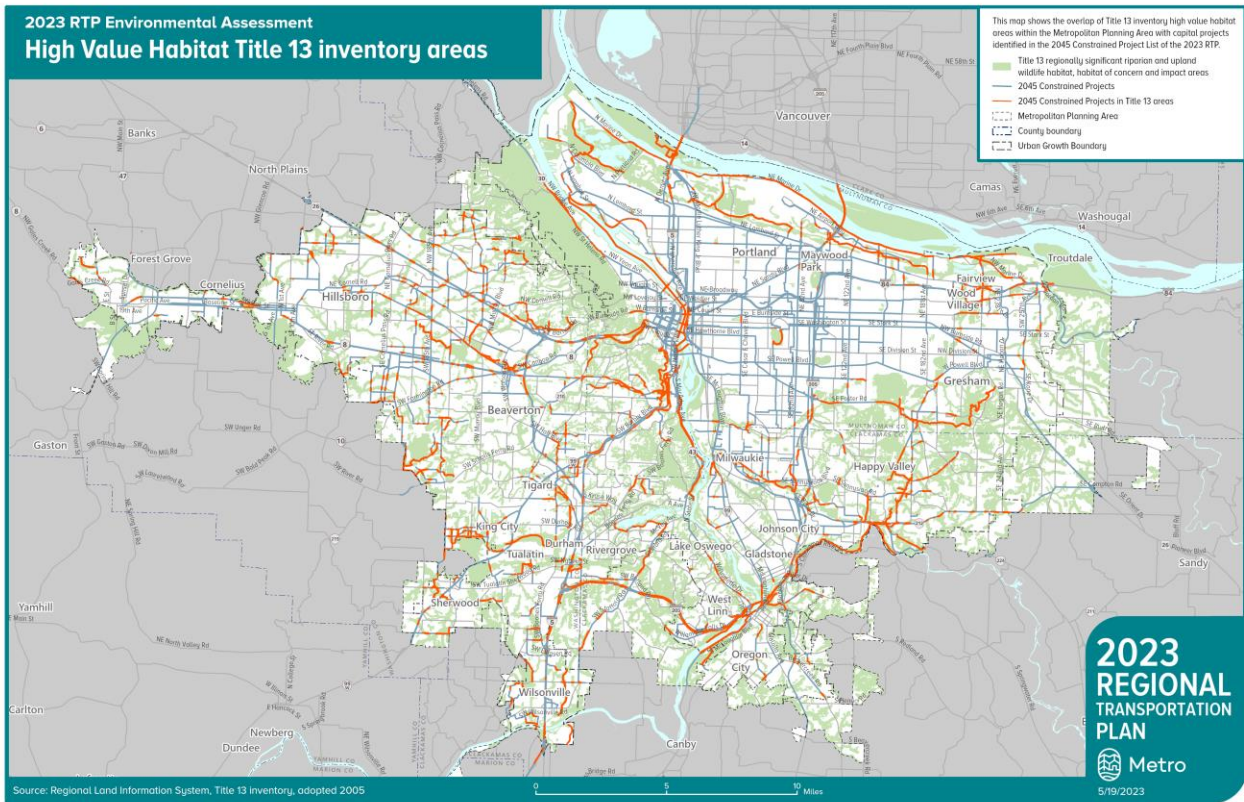
<sup>34</sup> <https://rlisdiscovery.oregonmetro.gov/datasets/drcMetro::title-13-habitat-conservation-areas/about>

**Table 7 Major capital projects intersecting Title 13 Habitat Conservation Areas**

Project Name	RTP ID	Estimated cost (in YOE dollars)
I-5 Interstate Bridge Replacement Program	10866	\$ 6,000,000,000
I-5 Rose Quarter/Lloyd District: I-405 to I-84 (UR, CN, OT)	11176	\$ 975,000,000
HCT: Southwest Corridor: PD, Engineering and ROW	12292	\$ 855,000,000
Earthquake Ready Burnside Bridge: Phase 3 (Construction)	12076	\$ 767,200,000
I-5 Boone Bridge and Seismic Improvement: SB Wilsonville Rd to Wilsonville-Hubbard Hwy (UR, CN, OT)	11990	\$ 670,000,000
I-205 Southbound and Northbound Widening and I-205 Toll Project (UR, CON, OT)	11904	\$ 557,000,000
I-205 Abernethy Bridge (CON)	11969	\$ 545,000,000
I-5 and I-205: Regional Mobility Pricing Project (PE, RW, UR, CN, OT)	12304	\$ 400,000,000
I-5 Freight Operational Improvements	11991	\$ 358,000,000
I-5 Rose Quarter/Lloyd District: I-405 to I-84 (PE, NEPA, ROW)	10867	\$ 338,000,000
OR 212/224 Sunrise Hwy Phase 2: SE 122nd to SE 172nd (CON)	11301	\$ 331,000,000
HCT: 82nd Ave Transit Project	12029	\$ 300,000,000
HCT: Tualatin Valley Highway Transit Project	11589	\$ 300,000,000
I-5 Southbound Truck Climbing Lane	11984	\$ 203,000,000
OR 217 Southbound Braided Ramps Beaverton-Hillsdale Hwy to Allen Blvd	11988	\$ 203,000,000
82nd Ave Corridor Improvements	11844	\$ 150,000,000
Earthquake Ready Burnside Bridge: Phase 2 (Design)	11376	\$ 127,600,000
Powell, SE (I-205 to 174th) Multi-Modal Improvements, Phase 2	11742	\$ 120,000,000
Farmington Rd. realignment and widening, sidewalks, bike lanes	10560	\$ 111,600,000

*Note: Maintenance and operations projects are excluded from the analysis. Analysis is for projects on the fiscally constrained list of projects, of the 1,066 projects on the list, 655 capital projects were analyzed.*

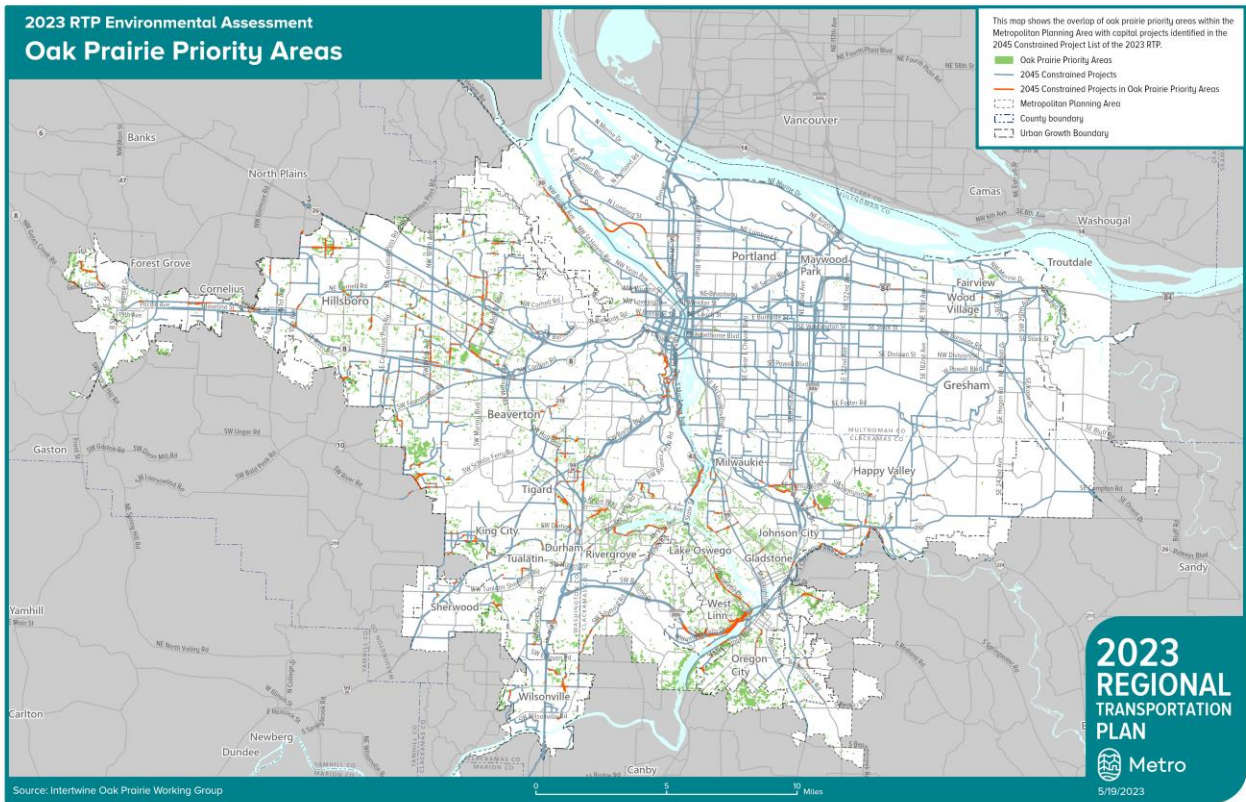
**Figure 5 Projects intersecting with High Value Habitat Title 13 Inventory Areas Map**



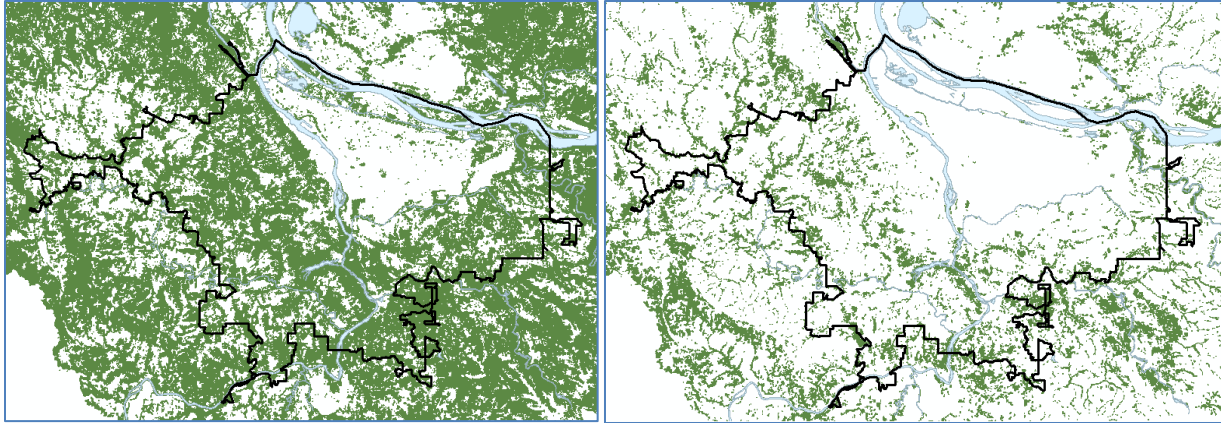
The analysis shows that 313, or 48%, of capital projects in the financially constrained list intersect with Oak Prairie Priority Areas.<sup>35</sup> This data is new to the RTP environmental assessment. Oregon’s imperiled Oregon white oak ecosystems harbor high biodiversity and represent a top conservation priority in Oregon. In 2011, the Intertwine Oak Prairie Work Group (OPWG) formed to improve conservation outcomes, support enhanced stewardship and public education, and coordinate a regional partnership of over 30 public agencies, park districts, non-profits, and community-based organizations.

<sup>35</sup> Oregon white oak data viewer:  
<https://drcmetro.maps.arcgis.com/apps/MapSeries/index.html?appid=c79f386100d340e2999ea7ec6e1dc0d4>

**Figure 6 White Oak Prairie Priority Areas Map**



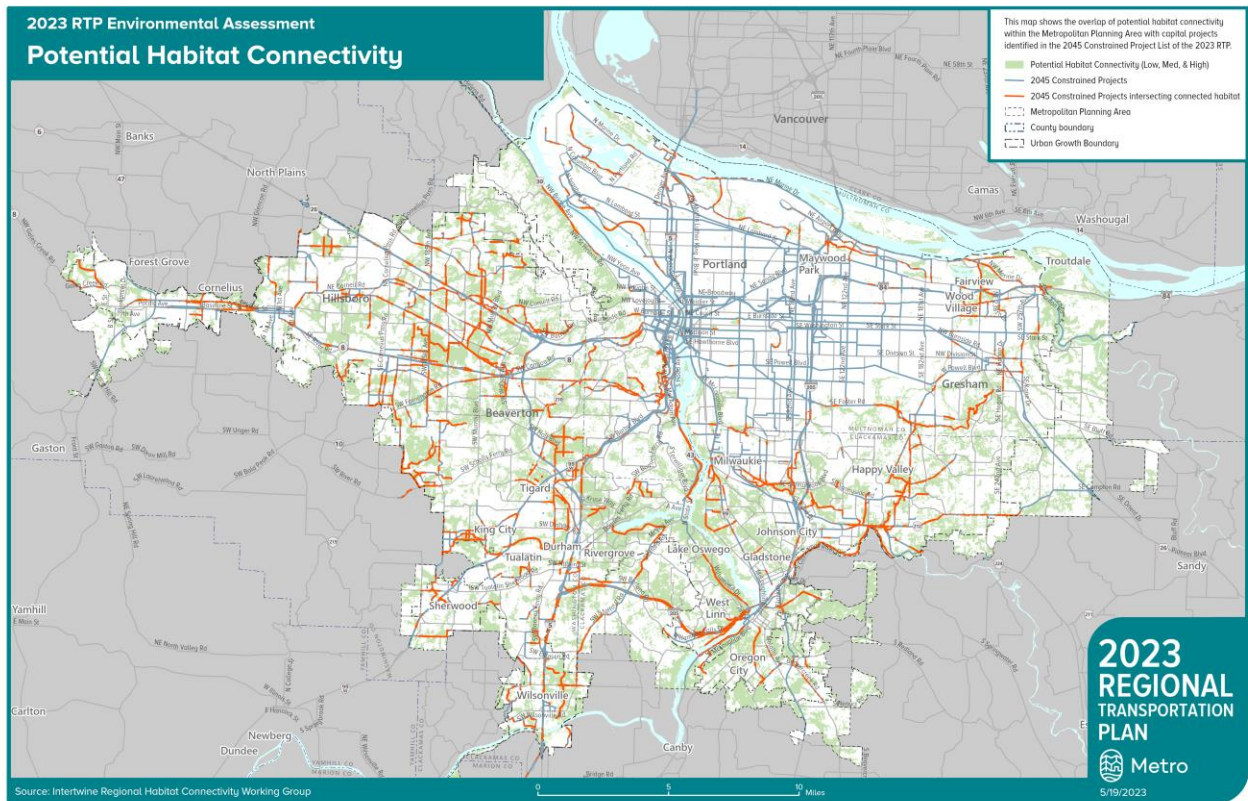
The analysis shows that 503, or 77%, of capital projects in the financially constrained list intersect with areas of habitat connectivity, as shown in the **Omniscope data**, which are key habitat areas and the best remaining, feasible connections between these “anchor” habitats. For the analysis areas identified as having Low, Medium, and High habitat connectivity were included, as shown in the image on the left below. The image on the right is only Medium and High.



*Low-Med High and Low-Med habitat connectivity*

The intention is to identify areas with the potential for habitat connectivity, even if it is not the highest quality habitat. Including only areas with only Medium and High habitat connectivity eliminates many patches that could be critical connections.

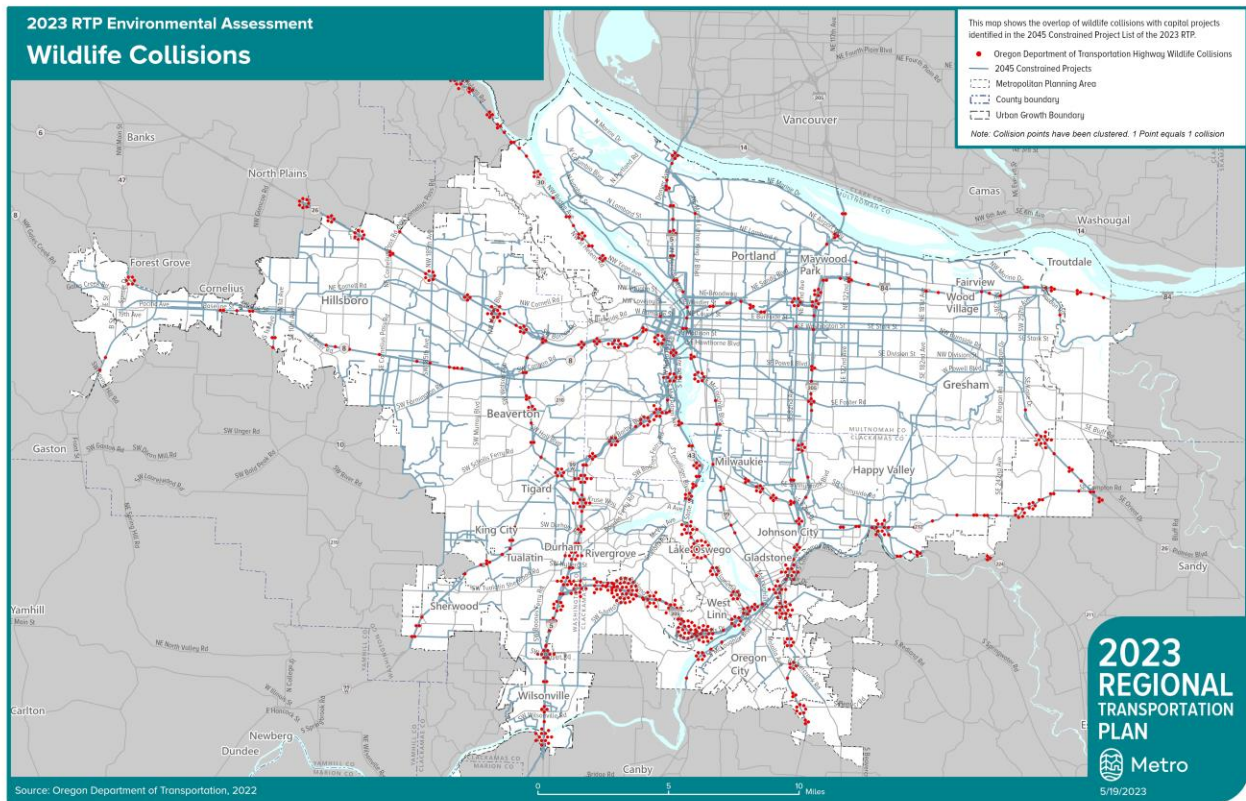
**Figure 7 Projects intersecting with Potential Habitat Connectivity Map**



**The analysis shows that 111, or 17%, of capital projects in the financially constrained list intersect with ODOT owned highways with documented wildlife**

**collisions, using ODOT data.** Data for the entire planning area is only available for wildlife collisions that occurred on ODOT highways.

**Figure 8 Wildlife Collisions on State Highways Map**



**The analysis shows that 141, or 21%, of capital projects in the financially constrained list intersect with Conservation Opportunity Areas, identified by the Oregon Department of Fish and Wildlife in the Oregon Conservation Strategy, which was approved by the agency in August 2016. The Oregon Conservation Strategy is an overarching plan to conserve Oregon’s fish and wildlife, and their habitats. It combines the best available science and conservation priorities with recommended voluntary actions and tools for all Oregonians to define their own conservation role. The U.S. Fish and Wildlife Service approved the 10-year revision of the Oregon Conservation Strategy in August 2016. There are 206 Conservation Opportunity Areas in the state, and approximately ten are wholly or partially within the greater Portland region. Data used for this analysis are Conservation Opportunity Areas updated by the Oregon Department of**

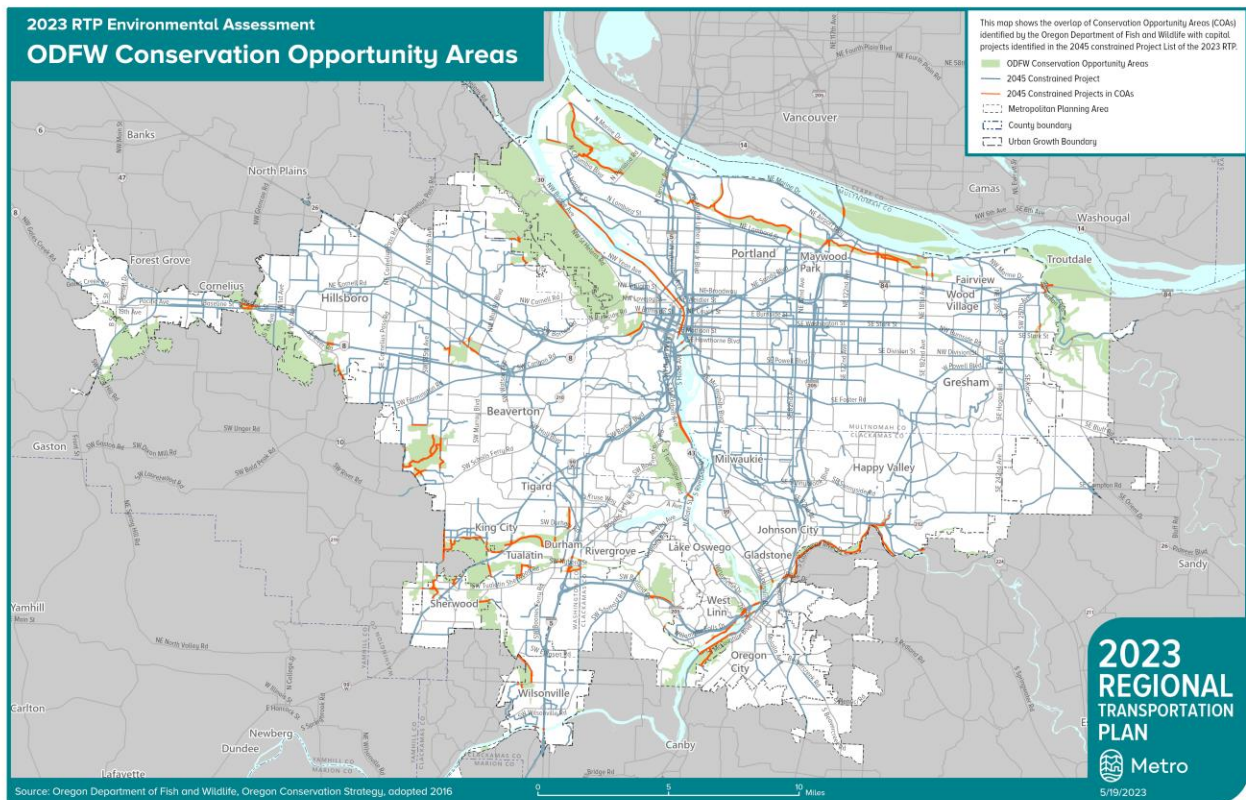


Fish and Wildlife in 2016.<sup>36</sup> Conservation Opportunity Areas are places where broad fish and wildlife conservation goals would best be met.

Multiple data sets were used to identify the boundaries of the Conservation Opportunity Areas:

- Wildlife (Amphibians, Birds, Mammals, Reptiles) (multiple data sources)
- Fish (ODFW Crucial Habitat Assessment: Aquatic Species of Concern)
- Habitats (multiple data sources)
- Climate Change (TNC Topo-Climate Diversity Model and Willamette River Cold Water Sources)
- Floodplains (FEMA 100 year flood zones)
- Barriers to Animal Movement (TNC Resistance Model and Species Permeability Model)
- U.S. Geological Survey (USGS) Protected Areas Database

**Figure 9 Projects intersecting with ODFW Conservation Opportunity Areas Map**



<sup>36</sup> Conservation Opportunity Areas data, maps and information can be found in the Oregon Conservation Strategy , here: <http://oregonconservationstrategy.org/conservation-opportunity-areas/>

### 2.3.3 Floodplains and flood hazard areas

Floodplains are usually flat areas near a prominent water feature such as a river, creek, or lake. Transportation projects and land development can change natural drainage and create new paths for runoff, with potentially dangerous consequences. Floodplains provide important habitat areas including river channels, riparian buffers, and wetlands. The variety of habitat types, the presence of water, and other factors result in a rich diversity of plant and animal species. Additionally, vegetation that grows in the floodplain influences how water flows across the land and can play a major role in controlling erosion and sediment deposition. When these features are lost, habitat and species diversity suffer.

This analysis looks at the potential impacts of projects to flood hazard areas and floodplains. The assessment identifies RTP projects that intersect with or fall within a 100-foot buffer of floodplains or flood hazard areas in the greater Portland region. Data used in the analysis is listed in Table 8.

**Table 8 Projects intersecting floodplains or flood hazard areas**

Environmental Concern Area Name	# of projects	% of projects
FEMA Floodplains and flood hazard areas	289	44%

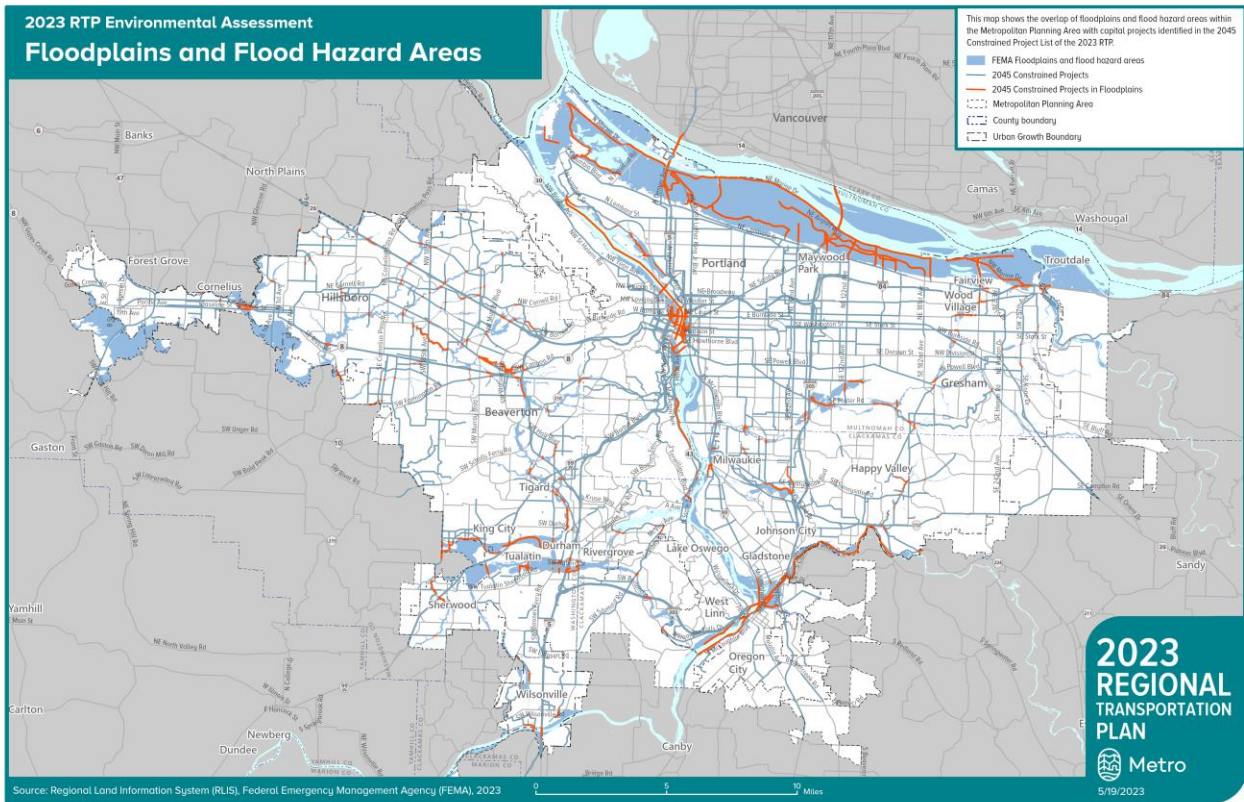
*Note: Maintenance and operations projects are excluded from the analysis. Analysis is for projects on the fiscally constrained list of projects, of the 1,066 projects on the list, 655 capital projects were analyzed.*

**The analysis shows that 291, or 44%, of capital projects on the financially constrained list intersect with areas identified as [floodplains and flood hazard areas in the FEMA data](#).**<sup>37</sup> The National Flood Hazard Layer (NFHL) data incorporates all Flood Insurance Rate Map (FIRM) databases published by the Federal Emergency Management Agency (FEMA), and any Letters of Map Revision (LOMRs) that have been issued against those databases since their publication date. The FIRM Database depicts flood risk information and supporting data used to develop the risk data. The primary risk classifications used are the 1-percent-annual-chance (or 100-year) flood event, the 0.2-percent-annual-chance (or 500-year) flood event, and areas of minimal flood risk.

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<sup>37</sup> Available at: Floodplains (FEMA) <https://rlis-discovery.drcmetro.hub.arcgis.com/datasets/bce509afe2b046bca63888feae7d48ad/about>

**Figure 10 Projects intersecting with Floodplains and Flood Hazard Areas Map**



### 2.3.4 Tribal lands

This analysis looks at the potential impacts of projects to Tribal lands. **There are no Federally designated Tribal lands<sup>38</sup> in the planning area.**

The lands now known as the greater Portland metropolitan area are part of the aboriginal homelands, traditional use areas and trade networks of numerous Tribes. For millennia, Indian people resided throughout the Willamette Valley and along the Willamette and Columbia Rivers and their tributaries in traditional villages, permanent communities and seasonal encampments. The relationship of Tribes, their lands and interests extend from time immemorial to the present day and beyond. Each Tribes interests are distinct. These interests may overlap and intersect with the static boundaries of Metro’s service area, metropolitan planning area boundary for the RTP and the urban growth boundary in various ways.

<sup>38</sup> Federally recognized Tribal lands refers an area of land reserved for a Tribe or Tribes under treaty or other agreement with the United States, executive order, or federal statute or administrative action as permanent tribal homelands, and where the federal government holds title to the land in trust on behalf of the Tribe. Approximately 56.2 million acres are held in trust by the United States for various Indian Tribes and individuals. Some reservations are the remnants of a Tribe’s original land base. Others were created by the federal government for the resettling of Indian people forcibly relocated from their homelands. Not every federally recognized Tribe has a reservation. Federal Indian reservations are generally exempt from state jurisdiction, including taxation, except when Congress specifically authorizes such jurisdiction.

### 2.3.5 Historic places

This analysis looks at the potential impacts of projects to historic places as defined in the National Register of Historic Places.

**Table 9 Projects intersecting with designated historic places**

Environmental Concern Area Name	# of projects	% of projects
Historic properties data from the National Register of Historic Places	48	7%

*Note: Maintenance and operations projects are excluded from the analysis. Analysis is for projects on the fiscally constrained list of projects, of the 1,066 projects on the list, 655 capital projects were analyzed.*

**The analysis shows that 48, or 7%, of capital projects in the financially constrained list intersect with places identified as historic.** The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources. More than 650 historic places and structures have been listed in the National Register in the metropolitan planning area.

Table 10 lists the names of historical places that fall within the 100-foot buffer of the RTP projects on the financially constrained list of projects. Most of the historical places are buildings on the street right-of-way, but some, such as the Burnside Bridge or the Vancouver-Portland Bridge, are transportation facilities.

**Table 10 Historical places in proximity of projects**

Project Name	RTP ID	Historical Places List
Earthquake Ready Burnside Bridge: Phase 3 (Construction)	12076	Burnside Bridge
I-5 and I-205: Regional Mobility Pricing Project (PE, RW, UR, CN, OT)	12304	Vancouver-Portland Bridge
I-5 Freight Operational Improvements	11991	Vancouver-Portland Bridge
HCT: Tualatin Valley Highway Transit Project	11589	Rice-Gates House
Earthquake Ready Burnside Bridge: Phase 2 (Design)	11376	Burnside Bridge
Broadway/Weidler Corridor Improvements	11646	Olsen and Weygandt Building
Central Eastside Access and Circulation Improvements	11841	New Logus Block

Project Name	RTP ID	Historical Places List
HCT: MAX Red Line Improvements Project: Capital Construction	10922	Brown Apartments; Pacific Building; Ray, Harold Wass, House; Zion Lutheran Church; Journal Building; Mallory Hotel; Vista Avenue Viaduct
Cesar Chavez Corridor Improvements	10315	Kendall, Joseph, House; Piper, Charles, Building; Ruby, Alfred C. and Nettie, House
Cornell Road Bike Lanes	10613	Young, John Quincy Adams and Elizabeth, House
ETC: Line 48 (Cornell/Barnes) safe access/enhanced transit corridor	12063	Young, John Quincy Adams and Elizabeth, House
ETC: Inner North Portland Enhanced Transit Corridor Improvements	11833	Rinehart Building; Vancouver Avenue First Baptist Church
ETC: SE Hawthorne/Foster Ave Enhanced Transit Corridor	11834	Douglas Building; Frances Building and Echo Theater; San Farlando Apartments
Harrison St Capacity Improvements	11542	Shindler, William, House
HCT: Streetcar Montgomery Park Extension	11319	Bergman, Joseph, House; Campbell Hotel; Landenberger, C. A., House
Lake Oswego to Portland Trail	10087	Sherrard--Fenton House
I-405 Corridor ITS Improvements	10266	Franklin Hotel; Brown Apartments; Neighbors of Woodcraft Building
I-5 Interstate Bridge Replacement Program	10866	Vancouver-Portland Bridge
Inner E Burnside Corridor Improvements	11816	Murphy, Paul C., House
Inner Holgate Blvd Corridor Improvements	10307	Palestine Lodge
Inner Powell Blvd Corridor Improvements: Local Contribution to State-Owned Arterial	10259	Gatehouse, Portland City Reservoir No. 2
Inner W Burnside Corridor Improvements	11959	Flatiron Building; Broadway Hotel; Hotel Alma
Marine Dr Corridor Safety Improvements	11864	Fisher, Raymond and Catherine, House
Marine Drive ITS	10346	Fisher, Raymond and Catherine, House
N Interstate Ave Bike and Ped Safety Improvements	11843	Cole, David, House; Smithson and McKay Brothers Blocks; Bunyan, Paul, Statue
N Lombard Corridor Improvements: Local Contribution to State-owned Arterial	10299	Yeon, John, Speculative House

Project Name	RTP ID	Historical Places List
NE MLK Jr Blvd Corridor Improvements	10302	Clovelly Garden Apartments
Passenger Ferry Pilot	12311	Broadway Bridge; Burnside Bridge; Morrison Bridge
Sandy Blvd Corridor Safety Improvements	10180	Hollywood Theatre; Oregon State Bank Building
Sandy Blvd ITS	10301	Hollywood Theatre; Oregon State Bank Building
Scholls Ferry Improvements	10577	Watkins, J. F., House
SE Powell Blvd ITS Improvements	12213	Gatehouse, Portland City Reservoir No. 2
SE Yamhill /Taylor Couplet	11793	International Harvester Company Warehouse; Enterprise Planing Mill
Sixties Neighborhood Greenway	11821	Wells--Guthrie House
South Shore Pathway	11396	Bates, John M. and Elizabeth, House No. 4
Springwater Gap Trail	10159	Portland Railway, Light and Power Sellwood Division Car barn Office and Clubhouse
Vista Bridge Renovation	11789	Vista Avenue Viaduct
W Burnside Corridor Improvements	10250	Campbell, David, Memorial; Hill Hotel
W Burnside St/Rd ITS Improvements	12238	Campbell, David, Memorial; Flatiron Building; Broadway Hotel; Hill Hotel; Hotel Alma
ETC: East Burnside/SE Stark Enhanced Transit Project	12030	Campbell, David, Memorial; Flatiron Building; Page and Son Apartments; Murphy, Paul C., House; Broadway Hotel; Hill Hotel; Hotel Alma; Burnside Bridge
ETC: Lombard/Cesar Chavez Enhanced Transit Project	12034	Kendall, Joseph, House; Piper, Charles, Building; Oregon State Bank Building; St. Johns Signal Tower Gas Station; Ruby, Alfred C. and Nettie, House; Yeon, John, Speculative House
ETC: NE MLK Jr Blvd Enhanced Transit Project	12027	Clovelly Garden Apartments; West, Nathaniel, Buildings; University Club; New Logus Block; Osborn Hotel; West's Block; St. James Lutheran Church; Italian Gardeners and Ranchers Association Market Building; Oregon Portland Cement Building; Cumberland Apartments; Ladd Carriage House; Vancouver-Portland Bridge; Hawthorne Bridge

Project Name	RTP ID	Historical Places List
ETC: NE Sandy Blvd Enhanced Transit Project	12028	Hollywood Theatre; Bank of California Building; Equitable Building; Sovereign Hotel; Wells Fargo Building; Lipman--Wolfe and Company Building; Bedell Building; Wilcox Building; Page and Son Apartments; Selling Building; Broadway Hotel; Lumbermen's Building; Kress Building; Public Service Building and Garage; Corbett Brothers Auto Storage Garage; Oregon State Bank Building; Ambassador Apartments; Burnside Bridge
ETC: SE Belmont Enhanced Transit Project	12033	Campbell, David, Memorial; Spalding Building; Commodore Hotel; Hyland, Olive and Ellsworth, Apartments; Postal Building; Elks Temple; Dekum, The; Waldo Block; Imperial Hotel; Arminius Hotel; Wilcox Building; Deere, John, Plow Company Building; Weist Apartments; Smith, Blaine, House; Packard Service Building; Hill Hotel; Neighbors of Woodcraft Building; Morgan Building; Genoa Building; Stevens Building; Yale Union Laundry Building; Morrison Bridge
ETC: SE Powell Blvd Transit Project	12035	Bank of California Building; Oregon Cracker Company Building; Equitable Building; Sovereign Hotel; Wells Fargo Building; Lipman--Wolfe and Company Building; Bedell Building; Wilcox Building; Gatehouse, Portland City Reservoir No. 2; New Houston Hotel; Selling Building; Lumbermen's Building; Kress Building; Public Service Building and Garage; Ambassador Apartments; Harrison Court Apartments
Water Ave Corridor Improvements and Realignment	11786	Auto Freight Transport Building of Oregon and Washington; Enterprise Planing Mill
Water/Yamhill Traffic Signal	11839	Enterprise Planing Mill
ETC: SW Beaverton-Hillsdale Hwy Enhanced Transit Project	12032	Bank of California Building; Equitable Building; Sovereign Hotel; Wells Fargo Building; Lipman--Wolfe and Company Building; Bedell Building; Wilcox Building; Selling Building; Broadway Hotel; Lumbermen's Building; Kress Building; Public Service Building and Garage; Corbett Brothers Auto Storage Garage; Ambassador Apartments; Harrison Court Apartments; Swetland Building

*Note: Maintenance and operations projects are excluded from the analysis. Analysis is for projects on the fiscally constrained list of projects, of the 1,066 projects on the list, 655 capital projects were analyzed.*

### 2.3.6 Urban heat islands

This analysis looks at the intersection of projects with urban heat islands in the greater Portland region.

**Table 11 Projects intersecting with urban heat islands**

Environmental Concern Area Name	# of projects	% of projects
Urban Heat Island	504	77%

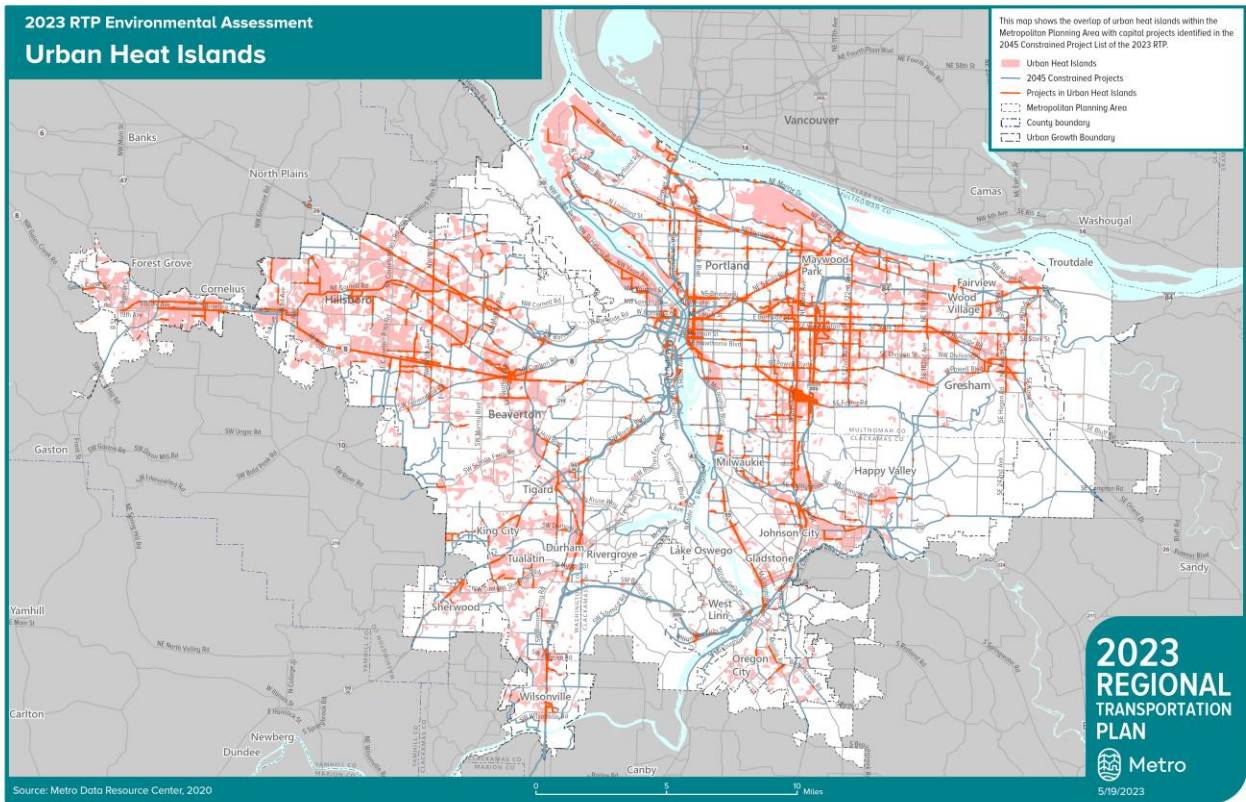
*Note: Maintenance and operations projects are excluded from the analysis. Analysis is for projects on the fiscally constrained list of projects, of the 1,066 projects on the list, 655 capital projects were analyzed.*

**The analysis shows that 7% of capital projects intersect with urban heat islands, using Metro’s Urban Heat Island Index (2020).** Heat islands are urban or developed areas that experience higher than average temperatures due to heat retained or even amplified by the built-out urban environment. Metro’s methodology identifies areas with the highest susceptibility to extreme urban heat conditions. The data displays the difference in surface temperature from the regional average. Attachment 6 provides the methodology identifying the Metro urban heat island index.

The analysis also shows that 61% of the projects intersecting urban heat islands are in areas identified as Equity Focus Areas by Metro.



**Figure 11 Projects intersecting with Metro Urban Heat Islands Map**



## Section 3. Methodology and Data

Metro developed a simple methodology to answer the following questions for the environmental assessment:

1. What percentage of the region's 2023 RTP transportation projects are in proximity to and may have a potential conflict with the region's resource areas and therefore requires further assessment of environmental considerations as the project goes through more detailed planning, project development and implementation?
2. What percentage of the region's 2023 RTP transportation projects are in proximity to and may have a potential conflict with designated historic resources, and therefore requires further assessment as the project goes through more detailed planning, project development and implementation?
3. What percentage of the region's 2023 RTP transportation projects are in proximity to and may have a potential conflict with federally recognized tribal lands, and therefore requires further assessment as the project goes through more detailed planning, project development and implementation?

To answer these questions, Metro took the following steps:

1. Consulted with Federal, State, and Tribal land management, wildlife, and regulatory agencies, and Metro Parks and Nature staff, in the RTP planning process to review the RTP update work plan, develop the data, methods, and approach used in the RTP environmental assessment and to review and refine identified mitigation activities.
2. Assembled datasets listed in Table 12.<sup>39</sup>
3. Added a 100' buffer from the center of the line or point in either direction (200' diameter) for all capital projects in the RTP project list. A 100' buffer is used because most of the projects are represented as centerlines so using a 50' buffer on each side would, in some cases, barely place the buffer outside the right-of-way; this is especially true for highways and throughways. Additionally, many of the environmental layers are mapped with limited precision, for example streams and wetlands may move over time, so a wider buffer helps account for these variations. The downside of this approach is a wider buffer ends up being applied to regional trails and other projects with a relatively narrow right-of-way. Polygon projects with areas less than 138,208,177 sq ft are included in the analysis but not buffered. Typically, there are very few polygons that

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<sup>39</sup> Metro and many partners from the Intertwine Alliance are actively working to improve regional prioritization data. Coordination with Metro staff is the best way to ensure the most current data are used in project planning.

met the area criteria, so the bulk of the analysis is for projects with point and line geometry. For this analysis, only 3 polygons met that size criteria.

4. Used Geographic Information System (GIS) mapping software to intersect capital projects in the RTP financially constrained list with the environmental and historical places data listed in Table 12.
5. For each data, found the number and percent of projects intersecting the environmental and historical places data. See Attachment 2 for information about the project list.
6. Identified the number by type of projects by 2023 RTP investment category<sup>40</sup> intersecting with environmental and historical places data. Only capital projects are included in the analysis. A capital project is a project to construct either new facilities or make significant, long-term renewal improvements in programs or to existing facilities. Out of the 1,068 projects in the RTP project list, 937 were included in the analysis, while 137 projects did not meet the spatial criteria to be included. Of the 937 capital projects included in the analysis, 657 projects intersected with one or more of the environmental areas of concern
7. The analysis results in a high level “flagging” of projects. Inclusion on this list does not necessarily mean that the project will negatively impact a given environmental or historical resource. Conversely, just because a project is not flagged on the list does not mean that there are not potential environmental or historical places impacts.

### 3.1 Data and Sources

**Table 12 Data and Sources**

Dataset	Type and Source of Data
Geospatial project information for proposed transportation projects	GIS data provided by transportation agencies
Regional Conservation Strategy High Value Habitat (top 25% scoring) Areas Inventory (2013) <sup>41</sup>	GIS data The Intertwine Regional Conservation Strategy <a href="http://www.regionalconservationstrategy.org/page/home">http://www.regionalconservationstrategy.org/page/home</a>

<sup>40</sup>The investment categories included in the analysis are: Mega Project, Active Transportation: Pedestrian, Active Transportation: Bicycle, Active Transportation: Pedestrian & Bicycle, Freight, Roadways (Capital), Bridge (Capital), Throughways, Transit: High Capacity, Transit: Better Bus, Transit-Oriented Development (TOD). While TOD projects were included in the analysis, the 4 TOD projects were in GIS as large polygons, so no projects in this category were actually included in the analysis.

<sup>41</sup>Regional Conservation Strategy high value habitat areas are those areas with the top 25% modeled score of high value habitat or riparian quality. Habitat quality took into account factors such as habitat interior, influence of roads, total patch area, relative patch area, habitat friction, wetlands, and hydric soils. The riparian areas took into account criteria of floodplains, distance from streams, and distance from wetlands. The analysis and modeled scoring was conducted for the entire Portland-Vancouver region and conducted through a collaborative effort with partners across the region and topic area experts through the development in the Resource Conservation Strategy process. More detail about the high value habitats can be found at [www.regionalconservationstrategy.org](http://www.regionalconservationstrategy.org)

Dataset	Type and Source of Data
Metro Title 13 Habitat Conservation Areas Layer (2005) <sup>42</sup>	GIS data Metro Data Resource Center, OregonMetro.RLIS <a href="https://rlis-discovery-drcmetro.hub.arcgis.com/">https://rlis-discovery-drcmetro.hub.arcgis.com/</a>
White Oak: presence of Oregon white oak trees ( <i>Quercus garryana</i> ), and whether the Oak Prairie Work Group has identified the oak area as a high priority	GIS data The Intertwine and Oak Prairie Work Group ( <a href="https://www.theintertwine.org/projects/oak-prairie-work-group">https://www.theintertwine.org/projects/oak-prairie-work-group</a> ) <a href="https://databasin.org/maps/06b9e1ffb404403fa6d0079c69989289/active/">https://databasin.org/maps/06b9e1ffb404403fa6d0079c69989289/active/</a> Oak data viewer: <a href="https://drcmetro.maps.arcgis.com/apps/MapSeries/index.html?appid=c79f386100d340e2999ea7ec6e1dc0d4">https://drcmetro.maps.arcgis.com/apps/MapSeries/index.html?appid=c79f386100d340e2999ea7ec6e1dc0d4</a> Access data locally at T:\zNAPP_GIS\mData\habitat\Oak2022\OakOPWG_2020_2022.gdbOakWoodlandPatches
Habitat Connectivity Omniscape modeled	GIS data from The Intertwine: Regional Habitat Connectivity Working Group
ODFW Conservation Opportunity Areas (2016) <sup>43</sup> Conservation Opportunity Areas data, maps and information can be found in the Oregon Conservation Strategy , here: <a href="http://oregonconservationstrategy.org/conservation-opportunity-areas/">http://oregonconservationstrategy.org/conservation-opportunity-areas/</a>	GIS data Oregon Department of Fish and Wildlife, the Oregon Conservation Strategy <a href="https://databasin.org/datasets/9f79ce2035b7402fb60ef70e63c72142">https://databasin.org/datasets/9f79ce2035b7402fb60ef70e63c72142</a>
Oregon Fish Habitat Distribution Data (fish-bearing streams, including essential salmon habitat and lamprey)	GIS data Oregon Department of Fish and Wildlife <a href="https://nrimp.dfw.state.or.us/DataClearinghouse/default.aspx?p=202&amp;XMLname=1167.xml">https://nrimp.dfw.state.or.us/DataClearinghouse/default.aspx?p=202&amp;XMLname=1167.xml</a>  Lamprey <a href="https://maps.dsl.state.or.us/esh/">https://maps.dsl.state.or.us/esh/</a>
Oregon Fish Passage Barriers (2020) <sup>44</sup>	GIS data from the Oregon Department of Fish

<sup>42</sup> Information on the date in which data was created or updated is available in the Metro “RLIS Metadata Viewer” under the data “time period of content” date listed.

<sup>43</sup> Multiple data sets were used to identify the boundaries of the Conservation Opportunity Areas:

- Wildlife (Amphibians, Birds, Mammals, Reptiles) (multiple data sources)
- Fish (ODFW Crucial Habitat Assessment: Aquatic Species of Concern)
- Habitats (multiple data sources)
- Climate Change (TNC Topo-Climature Diversity Model and Willamette River Cold Water Sources)
- Floodplains (FEMA 100-year flood zones)
- Barriers to Animal Movement (TNC Resistance Model and Species Permeability Model)
- U.S. Geological Survey (USGS) Protected Areas Database

<sup>44</sup> The following types of fish passage barriers were included in the analysis: Bridge, Culvert, Other and Unknown. Of those fish passage barrier types, those with the status of Blocked and Partial, Passable and Unknown and UnkAnad (“unknown passage within the range of anadromy”) were included in the analysis. Passable barriers were included to flag projects that would need to preserve passage and possibly make improvements.

Dataset	Type and Source of Data
	<p>and Wildlife Available at: <a href="https://nrimp.dfw.state.or.us/DataClearinghouse/default.aspx?p=202&amp;XMLname=44.xml">https://nrimp.dfw.state.or.us/DataClearinghouse/default.aspx?p=202&amp;XMLname=44.xml</a></p> <p><a href="https://www.dfw.state.or.us/fish/passage/inventories.asp">https://www.dfw.state.or.us/fish/passage/inventories.asp</a></p> <p>Metro included the following types of fish passage barriers in the analysis: Bridge, Culvert, Other and Unknown. Within these types, those with the status of Blocked and Partial, Passable and Unknown and UnkAnad (“unknown passage within the range of anadromy”) were included in the analysis. Passable barriers were included to flag projects that would need to preserve passage or make improvements.</p>
<p>National Wetlands Inventory (NWI), Local Wetlands Inventory (LWIs) and RLIS wetlands inventory. (SWI (Statewide Wetlands Inventory) (includes the NWI and LWI and DSL approved delineations, subsets of the National Hydrography Dataset (NHD) and subsets of the NRCS combined SSURGO/STATSGO dataset for Oregon<sup>45</sup> may be used in future analysis.</p>	<p>GIS data from the Oregon Department of State Lands <a href="https://www.oregon.gov/dsl/WW/Pages/SWI.aspx">https://www.oregon.gov/dsl/WW/Pages/SWI.aspx</a></p> <p>Local inventory: <a href="https://www.oregon.gov/dsl/WW/Pages/Inventories.aspx">https://www.oregon.gov/dsl/WW/Pages/Inventories.aspx</a></p> <p>There are no GIS data for the DSL approved delineations documents, however, DSL does provide cities and counties with the approved mapping with their copy of the approval letter. Some local governments with the capacity to do so have digitized this mapping. The datasets that make up the SWI may either be brought into local GIS using DSL’s services or may be downloaded and configured to match the SWI rendering using the directions in the “How to Configure” document found at the bottom of the SWI web page.</p>
<p>Title 3 Land (2006) delineates places protected by the Stream and Floodplain Protection Plan</p>	<p>GIS data Metro Data Resource Center, OregonMetro.RLIS <a href="https://rlis-discovery-drcmetro.hub.arcgis.com/">https://rlis-discovery-drcmetro.hub.arcgis.com/</a></p> <p><a href="https://rlisdiscovery.oregonmetro.gov/datasets/drcMetro::title-3-land-1/about">https://rlisdiscovery.oregonmetro.gov/datasets/drcMetro::title-3-land-1/about</a></p>

<sup>45</sup> For the purposes of planning/scoping level of work the SWI provides better information than the NWI alone both for waters, as represented by the NHD subsets, and representing wetlands that are likely unmapped on the NWI including small, forested, seasonal and farmed wetlands. These areas are captured by the “SWI soils subsets” as a “flag” showing where these unmapped wetlands might exist. In all cases and by rule (141-086- ) within their study areas the approved LWI mapping replaces the NWI as the LWIs are the approved and adopted Goal 5 documents and are more accurate than the above listed SWI datasets, including the NWI (other than approved delineations).

Dataset	Type and Source of Data
<p>FEMA flood hazard areas and floodplains (multiple years): 100-year Flood Plains (FEMA, January 2023)</p> <p>This is an export of FEMA’s National Flood Hazard Layer that shows the following categories (regulatory floodway, 1% annual chance flood event, the 0.2% annual chance flood event, and areas of minimal flood risk, areas with reduced flood risk due to levee).</p>	<p>GIS data from FEMA Available at <a href="https://rlis-discovery-drcmetro.hub.arcgis.com/datasets/bce509afe2b046bca63888feae7d48ad/about">https://rlis-discovery-drcmetro.hub.arcgis.com/datasets/bce509afe2b046bca63888feae7d48ad/about</a></p> <p>This is a copy of the National Flood Hazard Layer clipped to the region republished by Metro.</p>
<p>Wildlife Collisions (Animal Incident) Data on ODOT highways (2009-2022)</p>	<p>ODOT (Metro requested the data from ODOT; provided to Matthew Hampton 03/03/23) Metadata: <a href="https://geoportalprod-ordot.msapproxy.net/geoportal/catalog/search/resource/details.page?uuid=%7B1138484E-89A5-4456-9E24-44E5F2369CB2%7D">https://geoportalprod-ordot.msapproxy.net/geoportal/catalog/search/resource/details.page?uuid=%7B1138484E-89A5-4456-9E24-44E5F2369CB2%7D</a></p>
<p>2020 Urban Heat Index as derived from LandSat Data – Sorted by quantile classification with 5 classes, and select the top fifth quantile, areas with the greatest difference between their surface temperature and the regional average.</p>	<p>Satellite acquired difference in surface temperature from the regional average. Source: Landsat, LIDAR, Metro's Data Resource Center. Available at the <a href="https://regionalbarometer.oregonmetro.gov/pages/climate-adaptation">Regional Barometer</a>: <a href="https://regionalbarometer.oregonmetro.gov/pages/climate-adaptation">https://regionalbarometer.oregonmetro.gov/pages/climate-adaptation</a></p> <p>Metro data: <a href="\\alex\work\plan\drc\projects\22036 UHI 2020\C Data">\\alex\work\plan\drc\projects\22036 UHI 2020\C Data</a></p>
<p>Historic properties data from the National Register of Historic Places</p>	<p>GIS data from the National Register of Historic Places Database</p> <p>Available at: <a href="https://www.nps.gov/subjects/nationalregister/database-research.htm">https://www.nps.gov/subjects/nationalregister/database-research.htm</a></p>
<p>Bureau of Indian Affairs Federal Indian Land Area Representation (LAR) Dataset</p> <p>The LAR dataset depicts the exterior extent of a Federal Indian land area. Not all Federally-recognized Tribes have a designated land area; therefore, they may not have an associated land area represented in the land area dataset. There are currently no Federally recognized Tribal lands in the metropolitan planning area.</p>	<p>GIS data from U.S. Department of the Interior Indian Affairs; branch of geospatial support <a href="https://www.bia.gov/bia/ots/dris/bogs">https://www.bia.gov/bia/ots/dris/bogs</a></p> <p><a href="https://bia-geospatial-internal.geoplatform.gov/indianlands/">https://bia-geospatial-internal.geoplatform.gov/indianlands/</a></p>

### 3.2 Environmental data not included

As noted in the Purpose section, greenhouse gas emissions, air quality, and environmental justice and equity impacts are not included in this assessment and instead are addressed separately in Appendix J and Chapter 7.

Other data, listed below, has been suggested for inclusion by the Federal Highway Administration and Environmental Protection Agency. Metro has not included these due to a lack of a comprehensive regional database, not readily available and/or outdated and/or incomplete data. For future updates of the Regional Transportation Plan, Metro may explore using EPA's NEPAassist for additional datasets.<sup>46</sup>

These data should be considered as projects are planned and developed.

- Scenic/Historic/Backcountry Roads
- Superfund sites
- Brownfield sites
- Hazardous waste (RCRA) sites
- Previous ODOT mitigation sites
- Potential ODOT mitigation banks
- Division of State Lands existing mitigation banks
- Impaired streams and waterbodies/ water quality limited bodies [303(d) list (defined by the Department of Environmental Quality)
- National Marine Fisheries and U.S. Fish and Wildlife recovery/conservation plans

Oregon State law includes protections regarding the safekeeping and disclosure of information regarding archeological resources, including ORS 192.501(11) which protects the sharing of location information for archaeological sites in Oregon.<sup>47</sup> As a result, archeological data is not included in the assessment; however, this is important data for transportation planning agencies to consult on with appropriate agencies, including Oregon State Historic Preservation Office, when planning projects.

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<sup>46</sup> NEPAassist is a web-based application that draws environmental data dynamically from EPA GIS databases and web services, providing immediate screening of environmental assessment indicators for a user-defined area of interest. Datasets include impaired streams and waterbodies; and Superfund, Brownfields, and hazardous waste (RCRA) sites. NEPAassist is available at <https://www.epa.gov/nepa/nepassist>.

<sup>47</sup> ORS 97.740, ORS 358.905-358.961, ORS 390.235, OAR 736-051-0090 and ORS 192.501(11).

## Section 4. Mitigation Approach, Activities, and Resources

This section includes an overview of mitigation activities and resources that are used by governments and transportation agencies to preserve, restore, and maintain the environmental functions affected by transportation projects in the RTP. The information focuses on policies, programs, and strategies, rather than project specific mitigation. The mitigation activities listed here were identified by Metro in consultation with Federal, State, and Tribal land management, wildlife, and regulatory agencies.

Mitigation means the reduction of adverse effects of a proposed project by considering, in the following order:<sup>48</sup>

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action by monitoring and taking appropriate measures.
5. Compensating for the impact by replacing or providing comparable substitute water quality resource areas or habitat conservation areas.

Best practice for transportation agencies is to identify and apply mitigation activities using this hierarchical 'avoid, minimize or mitigate' approach. This ordered approach is known as "sequencing" and involves understanding the affected environment and assessing transportation effects throughout the project development process. As is clear in the name of the approach, avoiding disturbance of habitat is most desirable to preserve these resources, and where transportation improvements do have negative impacts, such impacts should be minimized and mitigated. Transportation agencies should follow this sequence when planning and scoping projects.

It is important for transportation agencies to identify negative impacts and mitigation activities early in the planning process, and to document needs and solutions throughout the planning and project development process. Early consideration of environmental

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<sup>48</sup> Definition of mitigation is from TITLE 10: FUNCTIONAL PLAN DEFINITIONS, 3.07.1010 Definitions, of the Urban Growth Management Functional Plan <https://www.oregonmetro.gov/sites/default/files/2018/04/16/urban-growth-management-functional-plan-04162018.pdf>



impacts also helps address National Environmental Policy Act (NEPA) and other requirements more effectively.

Specific project mitigations are developed as part of the environmental review and permitting process during project development activities, and may be established in consultation with numerous Federal, State, Tribal, and local agencies as well as interested parties responsible for and interested in environmental stewardship. Identification of potential transportation impacts during project development is done using Title 3 and Title 13 resource inventory data as a baseline, with acknowledgement that this data may be complemented with more current, jurisdictionally adopted inventory data.

It is cheaper and more effective to prevent water pollution and species declines through mitigation activities such as strategic habitat protection and restoration than it is to clean up polluted streams and rebuild species populations and habitats after they have declined.

Table 13 provides a short list of mitigation activities by environmental resource or mitigation area.

**Table 13 Mitigation activities by environmental resource or mitigation area**

Mitigation Activities	Regional Conservation Strategy high value habitat	Wildlife corridors	Oregon white oak habitat	Vegetation and wildlife	Fisheries and fish bearing streams	Wetlands and waterways	Flood hazard areas/floodplains	Threatened and endangered species	Stormwater management	Soil erosion/ sediment control	Historic resources	Air pollutants, including greenhouse gases
Allow narrow street right-of-ways through stream corridors	•	•	•	•	•	•	•	•	•	•		
Create new wetland areas at ratios established by the permitting agency	•	•		•	•	•	•	•	•	•		
Restore or rehabilitate damaged wetlands and waterways	•	•		•	•	•	•	•	•	•		
Purchase wetland credit acres from an existing wetland mitigation bank within the same watershed	•	•		•	•	•	•	•	•	•		

Prevent sedimentation and erosion to the greatest extent possible	•			•	•	•	•	•	•	•		
Reduce habitat fragmentation and maintain wildlife travel routes and fish passage by strategic placement of projects	•	•	•	•	•	•	•	•				
Restore all fish and wildlife habitat to pre-construction condition and enhance if possible	•	•	•	•	•	•	•	•				
Screen sensitive habitats from transportation facility view and noise	•	•	•	•	•	•		•				
Enhance vegetation associated with wetlands and water courses for wildlife	•	•		•	•	•		•				
Limit in-water construction to designated fisheries windows					•							
Limit fill within floodplains and effects to floodplain functions					•		•					
Carefully integrate fencing into the landscape to guide wildlife toward crossings under, over, or around transportation corridor <sup>49</sup>	•	•		•				•				
Use bridge crossings rather than culverts wherever possible, unless a culvert would provide better wildlife passage	•	•			•			•				

<sup>49</sup> Wildlife crossings: Providing safe passage for urban wildlife, Metro (2009).

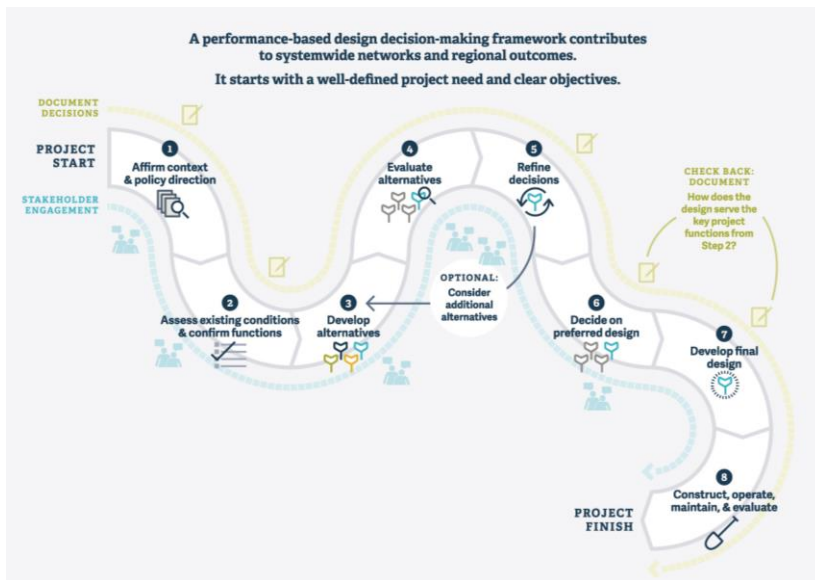
If culverts are utilized, install slab, arch, or box type culverts, preferably using bottomless designs that more closely mimic stream bottom habitat	•	•			•			•				
Design stream crossings for fish passage with shelves and other design features to facilitate terrestrial wildlife passage	•	•		•				•				
Include appropriate wildlife crossings	•	•	•	•	•							
Extend vegetative cover through the wildlife crossing in the migratory route, along with areas for wildlife to shelter	•	•	•	•		•		•				
Use native trees and plants when replanting or adding vegetation	•	•	•	•		•	•			•		
Minimize light pollution by following dark sky best practices <sup>50</sup>	•	•	•	•	•	•		•				
Preserve and maintain existing trees and tree canopy coverage, and plant trees, where appropriate, to maximize future tree canopy coverage	•	•	•	•		•	•		•	•		•
Document historic assets and use context-sensitive design of new or renovated infrastructure to complement existing streetscape or architectural features											•	

<sup>50</sup> Best practices can be accessed here: <https://www.nps.gov/articles/000/protecting-tranquility-in-a-bright-noisy-world.htm>

and Cinzano P., Falchi F. Elvidge C. 2001. The First World Atlas of the Artificial Night Sky Brightness, Monthly Notices of the Royal Astronomical Society, 328, 689-707. [646 KB PDF]

## 4.1 Use best available data

Transportation agencies should use the best available environmental data early in the planning and project scoping process. Even if the data is not required through regulation, seeking out the most up-to-date and comprehensive data will provide a better understanding of the environmental resources that need to be protected and conserved. Using a performance-based decision-making process in conjunction with the avoid, minimize, mitigate approach and documenting environmental impacts early in the process is an effective approach.



Source: Metro Designing Livable Streets and Trails Guide

<https://www.oregonmetro.gov/tools-partners/guides-and-tools/guidelines-designing-livable-streets-and-trails>

In addition to required data, such as Title 3 Lands and Title 13 Habitat Conservation Areas, other natural resource data should be used for transportation planning, including:

- Essential Salmonid Habitat (ESH)<sup>51</sup>
- Regional Conservation Strategy
- Oak Prairie High Priority Area
- Habitat Connectivity (Omniscape)
- Locations of wildlife collisions

<sup>51</sup> The ESH dataset is determined by ODFW and stewarded by DSL. The significance is that all ground disturbance within ESH waters and hydrologically connected wetlands requires DSL permits. <https://maps.dsl.state.or.us/esh/> Salmonid critical habitat data available at: [http://www.westcoast.fisheries.noaa.gov/protected\\_species/salmon\\_steelhead/salmon\\_and\\_steelhead\\_listings/steelhead/lower\\_columbia\\_river/lower\\_columbia\\_river\\_steelhead.html](http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/salmon_and_steelhead_listings/steelhead/lower_columbia_river/lower_columbia_river_steelhead.html)

- Conservation Opportunity Areas
- Willamette River Greenway Inventory includes fish and wildlife habitat<sup>52</sup>

#### **4.2 Consult with tribes, natural resource agencies and natural resource scientists early**

Formal consultations with tribes and Federal and State resource agencies in the RTP planning process illustrates the importance of early assessment of environmental impacts early in the process of developing projects.

Ongoing environmental mitigation consultation with relevant federal and state agencies occurs through Metro’s Transportation Policy Alternatives Committee (TPAC) and Joint Policy Advisory Committee on Transportation (JPACT), which includes representatives from the Oregon Department of Environmental Quality (DEQ), the Oregon Department of Transportation (ODOT), and port and transit districts; the Metro Technical Advisory Committee (MTAC) and Metro Policy Advisory Committee (MPAC), which include representatives from the Oregon Department of Land Conservation and Development (DLCD), and port and transit districts.

As projects develop, a multidisciplinary project team improves decision-making to develop design-based solutions. Agencies should strive to create multidisciplinary project teams that collaborate throughout the planning and design process. Including multidisciplinary technical staff and teams helps ensure the needs of the community are addressed, that projects are feasible and that desired outcomes are met.

Involving people with relevant technical skills early in the project in areas such as civil engineering, landscape architecture, natural resource preservation, cultural resources, and geotechnical engineering, particularly in developing and evaluating alternatives, allow teams to identify and address feasibility or implementation challenges early on.

Consulting with interested and federally recognized tribes and Federal, State, and regional agencies early in the process, and involving people with policy and community engagement skills throughout the development of the final design can help ensure that later design decisions continue to meet environmental regulations align with policy goals and community needs and priorities.

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<sup>52</sup> Willamette River Greenway Inventory <https://www.portlandoregon.gov/bps/article/508803> and Goal 15 Willamette River Greenway <https://www.oregon.gov/LCD/docs/goals/goal15.pdf>

### 4.3 Mitigation activities for vegetation and wildlife

Mitigation for vegetation and wildlife impacts should be coordinated with mitigation for other related environmental impacts, such as wetlands.

Mitigation strategies available include:

- Avoiding disturbance of the area.
- Reducing habitat fragmentation and maintaining wildlife travel routes by strategic placement of the projects.
- Screening sensitive habitats from project view and noise.
- Installing appropriate wildlife crossings.
- Enhancing vegetation associated with wetlands and water courses for wildlife.

### 4.4 Mitigations activities for fisheries

It is the policy of the State of Oregon to provide for the upstream and downstream passage for native migratory fish. Concerns with stream crossings include the potential for water quality degradation during construction, long-term storm water treatment and loss of floodplain functions. Agency coordination with the project design team should develop potentially effective stream crossing methods and stormwater management plans.

Five touchstones for preserving a healthy river:<sup>53</sup>

- Hydrology
- Geomorphology
- Connectivity
- Native riparian vegetation
- Native aquatic biota

Fish passage barriers can be man-made or natural blockages to the free movement of fish species through a waterway. Upstream blockages that prevent spawning of fish, especially those that are identified as threatened or endangered, are of significant importance. Fish barriers can come in the form of culvert blockages, dams, shallow water, or a combination of factors that prevent fish from reaching their spawning grounds. Transportation projects that may develop new barriers, or intersect existing barriers will require adequate fish passage as directed by State law.

Mitigation strategies available include:

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<sup>53</sup> Umatilla River Vision

- Following New 2023 Fish Passage Administrative Rules - Div 41254 including 635-412-0035 Fish Passage Criteria and 635-412-0040 Fish Passage Mitigation Criteria
- Limiting in-water construction to designated fisheries windows.
- Provide treatment of storm water run-off.
- Limit removal of riparian vegetation and restore/replant all areas temporarily distributed during constructions.
- Limit fill within floodplains and effects to floodplain functions.
- Construct bridges or open bottom culverts.
- Provide restoration and enhancement of fish habitat.
- Green Stormwater Infrastructure (GSI) is effective at reducing mortality rates for coho exposed to stormwater, and relatively inexpensive mitigation measures like bioswales can dramatically improve water quality and promote salmon survival.

#### 4.5 Mitigation activities for wetlands and waterways

Generally, wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.<sup>55</sup> Restoration of wetland hydrology to more historical patterns (i.e., before the Columbia River dam era) has the potential to reverse the levels of plant invasions and at least partially restore native plant communities.<sup>56</sup>

Mitigation strategies available include:

- Designing transportation facility to avoid or minimize the “footprint” of new impervious surfaces.
- Creating new wetland areas at ratios established by the permitting agency.
- Restoring or rehabilitating damaged wetlands and waterways.
- Purchasing wetland credit acres from an existing wetland mitigation bank within the same watershed, if available.

<sup>54</sup> <https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=2988>

<sup>55</sup> <http://www.epa.gov/owow/wetlands/what/definitions.html>

<sup>56</sup> Intertwine Alliance Regional Conservation Strategy

[https://www.theintertwine.org/sites/default/files/Regional%20Conservation%20Strategy%20for%20the%20Greater%20Portland-Vancouver%20Region\\_0.pdf](https://www.theintertwine.org/sites/default/files/Regional%20Conservation%20Strategy%20for%20the%20Greater%20Portland-Vancouver%20Region_0.pdf)

- Providing a vegetated corridor to separate Protected Water Features from development.
- Maintaining or reducing stream temperatures;
- Maintaining natural stream corridors.
- Minimizing erosion, nutrient and pollutant loading into water
- Filtering, infiltration and natural water purification.
- Stabilizing slopes to prevent landslides contributing to sedimentation of water features.

Wetlands and waterway mitigation should be coordinated with other environmental mitigation planning to minimize mitigation costs and to ensure a comprehensive approach to mitigation is achieved. In 2008, EPA and the U.S. Army Corps of Engineers, through a joint rulemaking, expanded the Clean Water Act Section 404(b)(1) Guidelines to include more comprehensive standards for compensatory mitigation.<sup>57</sup>

### Mitigation Banks

A mitigation bank is a wetland, stream, or other aquatic resource area that has been restored, established, enhanced, or (in certain circumstances) preserved for the purpose of providing compensation for unavoidable impacts to aquatic resources permitted under Section 404 or a similar state or local wetland regulation. A mitigation bank may be created when a government agency, corporation, nonprofit organization, or other entity undertakes these activities under a formal agreement with a regulatory agency.

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<sup>57</sup> Refer to the Compensatory Mitigation for Losses of Aquatic Resources under CWA Section 404 (Final Rule). Available at <https://www.epa.gov/cwa-404/compensatory-mitigation-losses-aquatic-resources-under-cwa-section-404-final-rule>



**Table 14 Wetland mitigation banks serving the greater Portland region (as of July 2018)<sup>58</sup>**

For service area maps and contact information for each bank:  
<https://www.oregon.gov/dsl/WW/Pages/MitigationMap.aspx>

**Foster Creek Bank**

**Nearest City:** Estacada

**Service Area:** Lower Clackamas basin and Abernethy Creek watersheds

**Potential wetland credits remaining:** 8

**Butler Mitigation Bank**

**Nearest City:** Hillsboro

**Service Area:** Tualatin watershed

**Potential wetland credits remaining:** 30

**Tualatin Valley Environmental Bank**

**Nearest City:** Hillsboro

**Service Area:** Tualatin watershed

**Potential wetland credits remaining:** 12

**Halfmile Lane In-Lieu-Fee Mitigation Project**

**Nearest City:** Forest Grove

**Service Area:** Tualatin watershed

**Potential wetland credits remaining:** 8

**Currently offering stream credits**

**Bobcat Marsh Mitigation Bank** – Available ONLY to Port of Portland, City of Hillsboro, and ODOT

**Nearest City:** Hillsboro

**Service Area:** Tualatin watershed

**Potential wetland credits remaining:** 3.7

## 4.6 Mitigation activities for floodplains and flood hazard areas

A floodplain is an area designated either by the state or federal governments as being susceptible to flooding (the inundation of water in an otherwise dry area). Any development within a regulated flood hazard zone or floodplain is required to take all reasonable measures necessary to minimize adverse environmental impacts resulting from the construction of the proposed project.

Title 3 of the Urban Growth Management Functional Plan applies to development in water quality resource and flood management areas and was adopted in 1997. Title 3 includes the Metro Water Quality and Flood Management Area Map and a model ordinance. The

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<sup>58</sup> For service area maps and contact information for each bank:  
<https://www.oregon.gov/dsl/WW/Pages/MitigationMap.aspx>

purpose of Title 3 is to protect the beneficial water uses and functions and values of resources within the water quality and flood management areas by avoiding, minimizing, or mitigating the impact on these areas from development activities.

Mitigation strategies available include:

- Building in and maintaining effective drainage systems, including ditches, culverts, and catch basins are critical in infrastructure improvements and maintenance.
- Restoring temporarily disturbed vegetation with vegetation of equal or higher quality.
- Restoring all habitats to their pre-construction condition.
- Restoring all land and water features to their pre-construction condition.
- Preventing sedimentation and erosion to the greatest extent possible.

#### **4.7 Mitigation activities for stormwater management**

Impervious surfaces have been linked to flooding and changes in hydrology, the shape of streams, water quality, water temperature and the biological health of waterways.

Mitigation activities available include:

- Limit construction of impervious surfaces.
- Use Green Infrastructure and low impact development approaches such as pervious surfaces and the use of natural landscaping that encourage absorption of stormwater at the source rather than channeling it elsewhere are encouraged where practicable.
- Preserve and maintain existing trees and tree canopy coverage, and plant trees, where appropriate, to maximize future tree canopy coverage.

With respect to runoff quality, recent research by the National Marine Fisheries Service and Washington State University points to the high aquatic toxicity of runoff from roadway surfaces. This toxicity is directly proportional to traffic volumes. Stormwater facilities that are vegetated and contain compost-amended soils represent the only currently effective treatment options to address these often unidentified toxic compounds. Such facilities are also required to be prioritized in current National Pollutant Discharge Elimination System (NPDES) municipal stormwater permits across the region.

In 1987 Congress amended the Clean Water Act to include nonpoint sources of pollution. Nonpoint pollution occurs when runoff from land carries pollutants to receiving waters. Section 402 of the CWA provides the legal basis for the National Pollutant Discharge

Elimination System (NPDES) permit program, which regulates point and nonpoint discharges. The U.S. Environmental Protection Agency (EPA) has delegated the implementation of the NPDES program to the state of Oregon. The Oregon Department of Environmental Quality administers the NPDES program through Oregon Revised Statute (ORS) 468B and associated Oregon Administrative Rules (OAR). ORS 468B.025 explicitly prohibits the discharge or placement of wastes into waters of the state, prohibits the discharge of waste that causes violations of water quality standards, and prohibits violations permit conditions. In addition to Federal requirements, many local jurisdictions have developed storm water management programs that include erosion and sediment control requirements.

Non-point pollution or uncontrolled and untreated stormwater runoff from paved and other impervious surfaces carries pollutants into surface and ground waters, with negative effects on aquatic life, drinking water and recreational resources. Additionally, fast moving surface runoff erodes stream banks, channeling meandering streams into fast moving torrents during storm events. Storm water management rules regulate discharges of pollutants to surface and ground water by controlling the construction of impervious surfaces. These include paved roads and paths, parking facilities, and other development. With respect to runoff quantity, development in the region at increasing density results in less pervious surface available to absorb the combined runoff volumes from transportation surfaces, structures and associated impervious area. Runoff volumes of winter peak flows can more than double from pre-developed conditions in the face of urban development, with associated flow reductions in summer. Climate change is expected to reinforce this pattern. Higher runoff volumes result in channel erosion, aquatic and floodplain habitat degradation, and damage to infrastructure (including transportation infrastructure such as bridges and culverts). Low summer flows reduce the vigor of vegetation that helps stabilize stream banks. Yet more than half of the region, including nearly all the area west of the Willamette River, has subsurface conditions that do not promote easy infiltration of large volumes of urban runoff.

Some communities in the region, such as the City of Portland, have formally adopted these practices. Clean Water Services in Washington County, for example, updated their Design and Construction Standards in 2017. Clean Water Services also has developed a Low Impact Development Approaches (LIDA) handbook – last updated in 2016 – to promote and encourage use of low impact development approaches in the Tualatin River Watershed.<sup>59</sup> The handbook is a supplement to the Standards and is to be used in conjunction with them and other applicable regulations.

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<sup>59</sup>The updated standards and low impact development approaches (LIDA) handbook can be accessed at <https://www.cleanwaterservices.org/permits-development/design-construction-standards/>

#### **4.8 Mitigation activities for soil erosion and sediment control**

To minimize unavoidable soil displacement occurring during construction and prevent future soil erosion, Soil Erosion and Sediment Control Plans are developed to prevent pollution of water resources as required by National Pollutant Discharge Elimination System permits and by other laws, permits, agencies and agreements. Soil Erosion and Sediment Control Plans help ensure that the proper soil stabilizing techniques have been fully incorporated into the project design prior to construction. In addition to Federal requirements, many local jurisdictions have developed stormwater management programs that include erosion and sediment control requirements.

Mitigation activities available include:

- Maintaining natural vegetation to the greatest extent possible.
- Limiting the amount of exposed soil.
- Seeding to establish vegetation in disturbed areas.
- Dust control measures.
- Stabilizing steep slopes.
- Installing silt fencing, sediment barriers and other best management practices to secure the project area.
- Re-vegetating all temporarily disturbed areas with native plants.
- Properly directing, collecting and conveying storm water runoff to reduce the volume and velocity of surface water runoff.

#### **4.9 Mitigation activities for cultural and historic places and resources**

Cultural and historical resources are unique, and by nature, irreplaceable. Potential transportation project related impacts may include physical changes to culturally important places, including natural features, historic transportation infrastructure, effects of road widening on cultural and historic places, settings or structures, effects on historic roadside elements, effects of air pollution on resources due to increased traffic, and disturbance or infringement on cultural landscapes. The nature of these impacts is highly site and project specific, and the information about historic resources is constantly evolving.

It is important for each project to be evaluated in the specific context and timeframe in which it is designed with up-to-date information.

There are several state and federal laws and regulations that call for preservation and/or enhancement of historic and cultural resources where appropriate mitigation and design

elements should be addressed. Of specific relevance to transportation projects are Section 106 of the National Historic Preservation Act (NHPA) of 1966 and Section 4(f) of the Department of Transportation Act of 1966.

Section 106 of the National Historic Preservation Act (NHPA) requires all federal agencies to consider the effects of their actions on historic properties. All properties listed in the National Register are protected by the Oregon State Historic Preservation Office.

Mitigation activities available include:

- Avoidance of unique and irreplaceable cultural and historical places and resources.
- Preservation and documentation of these assets along with context-sensitive design of new or renovated infrastructure to complement existing streetscape or architectural features as closely as possible.

#### **4.10 Implement land use plans, air quality, and greenhouse gas reduction strategies**

Implementing land use plans and greenhouse gas reduction strategies that will reduce travel by motor vehicle and the need to expand highways and roads are key strategies to protecting the environment. More information about the region's efforts to reduce on-road vehicle emissions can be found in Appendix J.

Activities in these plans that will reduce improve air quality, reduce greenhouse gas emissions, and reduce stormwater runoff:

- Building walkable communities and job centers facilitated by focusing growth and development in designated areas in combination with walking, biking and transit connections;
- supporting state efforts to advance cleaner, more fuel-efficient vehicles, including low- and zero-emission vehicles;
- implementing policies and investments that support increased use of transit, walking and biking, including expanded transit service coverage and frequency and improvements in the right-of-way to increase speed and reliability of buses and MAX;
- improving multimodal network connectivity, including a well-connected network of streets and new biking and walking connections to transit, schools, jobs, downtowns and other community places;
- expanding use of parking management, commuter travel options programs, and household individualized marketing programs
- system management and operations investments to smooth traffic flow, including variable message signs and speed limits, signal timing and ramp metering, transit signal priority, bus-only lanes, and incident response detection and clearance.

These approaches seek to reduce vehicle miles traveled and related vehicle emissions, including greenhouse gas emissions, in accordance with the federal Clean Air Act and Oregon Metropolitan Greenhouse Gas Emissions Reduction Rule.

The Department of Environmental Quality (DEQ) has convened a work group to develop a regional clean air construction strategy for clean diesel equipment and vehicles on select public improvement projects. The region and RTP will adhere to DEQ air quality program changes that are implemented through the State Implementation Plan as part of ongoing implementation of the Transportation Control Measures.

#### 4.11 Resources for Mitigation Activities

- [FHWA Eco-Logical Environmental Review Toolkit](#)<sup>60</sup> The Eco-Logical approach organizes current methods for addressing natural resource identification, avoidance, minimization and mitigation into a systematic, step-wise process that starts at the beginning of the transportation planning process and concludes with establishing programmatic approaches to recurring natural resource issues that are implemented at the project level.
- **EPA's NEPAAssist.** NEPAAssist is a web-based application that draws environmental data dynamically from EPA GIS databases and web services, providing immediate screening of environmental assessment indicators for a user-defined area of interest. Datasets include impaired streams and waterbodies; and Superfund, Brownfields, and hazardous waste (RCRA) sites. NEPAAssist is available at <https://www.epa.gov/nepa/nepassist>
- **Protecting Cultural Resources & Transportation**  
When planning transportation projects, it is always important to consider cultural resources and materials. [Center for Environmental Excellence AASHTO](#)
- [AASHTO Practitioner's Handbook for Complying With Section 7 of the Endangered Species Act for Transportation Projects](#) (November 2016) for an overview and advice on carrying out Section 7 consultation for transportation projects.<sup>61</sup>
- [https://www.oregon.gov/odot/Planning/Documents/ODOT%20 Guide to Linking Planning and NEPA.pdf](https://www.oregon.gov/odot/Planning/Documents/ODOT%20Guide%20to%20Linking%20Planning%20and%20NEPA.pdf)

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<sup>60</sup> [https://www.environment.fhwa.dot.gov/env\\_initiatives/eco-logical.aspx#:~:text=The%20Eco%2DLogical%20approach%20organizes,programmatic%20approaches%20to%20recurring%20natural](https://www.environment.fhwa.dot.gov/env_initiatives/eco-logical.aspx#:~:text=The%20Eco%2DLogical%20approach%20organizes,programmatic%20approaches%20to%20recurring%20natural)

<sup>61</sup> <https://environment.transportation.org/resources/practitioners-handbooks/complying-with-section-7-of-the-endangered-species-act-for-transportation-projects/>

- **Technical Assistance for Natural Resource Data** – Metro staff are available to provide information and assistance on the most up-to-date natural resource data available as projects are planned and developed. Lori Hennings, Senior Natural Resource Scientist is the key contact for technical assistance. Email: [lori.hennings@oregonmetro.gov](mailto:lori.hennings@oregonmetro.gov) and phone: 503-797-1940.
- **Metro Complete Streets Program** – published six best practices in transportation design handbooks – (1) [Designing Livable Streets and Trails](#)<sup>62</sup> (2019), (2) Green Streets: Innovative Solutions for Stormwater and Stream Crossings (2002), (3) [Trees for Green Streets](#) (2002)<sup>63</sup>, (4) [Green Trails: Guidelines for Environmentally Friendly Trails](#) (2004)<sup>64</sup>, (5) [Wildlife Crossings](#) (2009)<sup>65</sup>, (6) [Lighting Regional Trails Best Practices and Recommendations](#) (2016)<sup>66</sup> – to provide design and construction guidelines to minimize transportation impacts on natural resources and wildlife when avoidance is not possible. The first three handbooks are currently being updated and will incorporate and reference the last three more recent handbooks related to trails and wildlife.
- **Top Ten Natural Resource Considerations for Trails Planners** ([Regional Active Transportation Plan](#) 2014 ) The plan recommends “Top 10 Natural Resource Considerations for Trails Planners” and mapped the Regional Active Network with the Regional Conservation Strategy high value habitat areas to show places where these considerations should be applied during future planning, project development and construction.

**Top 10 Natural Resource Considerations for Trails Planners (Metro 2014)**

1. Engage natural resource experts and professionals early and often.
2. Identify natural resource information sources.
3. Do you really need a trail there?
4. Early reconnaissance on what wildlife or fish species you might disturb – what surveys will you need?
5. Use complementary funding sources to incorporate more wildlife considerations.
6. Engage wildlife experts for surveys and site-specific information.
7. Avoid impacts on fish, wildlife and their habitats. If you can't avoid it, minimize the harm and make up for the damage.
8. Stay out of the water.
9. Some animals need large, private homes; avoid habitat fragmentation.
10. Fish and wildlife need “trails,” too; explicitly consider wildlife corridors and barriers.

<sup>62</sup> <https://www.oregonmetro.gov/tools-partners/guides-and-tools/guidelines-designing-livable-streets-and-trails>  
<sup>63</sup> <https://www.oregonmetro.gov/trees-green-streets>  
<sup>64</sup> <https://www.oregonmetro.gov/green-trails-guidelines-environmentally-friendly-trails>  
<sup>65</sup> <https://www.oregonmetro.gov/wildlife-crossings-providing-safe-passage-urban-wildlife>  
<sup>66</sup> [https://www.oregonmetro.gov/sites/default/files/2019/05/28/LightingRegionTrail\\_April2016\\_rev.pdf](https://www.oregonmetro.gov/sites/default/files/2019/05/28/LightingRegionTrail_April2016_rev.pdf)

- **Climate Smart Strategy** – adopted in 2014 by the Metro Council, the strategy defines policies, strategies and near-term actions to guide how the region integrates reducing greenhouse gas emissions with on-going agency efforts to implement the 2040 Growth Concept and Regional Transportation Plan. Implementation of the strategy, through the Regional Transportation Plan, will reduce stormwater run-off and related water pollution and air pollution, including air toxics and greenhouse gas emissions.
- **Metro Growth Management Program** – This program is responsible for managing the region’s urban growth boundary. Land inside the urban growth boundary supports community development and urban services such as roads, water and sewer systems, parks, schools and fire and police protection. The boundary is one of the tools to protect farms, forests and natural areas from urban sprawl and promote the efficient use of land, public facilities and services inside the boundary. In 2007, a system for designating urban and rural reserves was put in place, further honing criteria for bringing land into the boundary.
- **Regional Functional Plans** – Metro’s Urban Growth Management Functional Plan (UGMFP) and Regional Transportation Functional Plan (RTFP) direct how local governments implement the 2040 Growth Concept and Regional Transportation Plan. Title 3 of the UGMFP addresses water quality and flood management, Title 13 addresses protection of riparian and upland wildlife habitat and use of habitat-friendly development practices. Metro reviews local plans as they are amended and publishes an annual compliance report. Title 1 of the RTFP addresses system design to ensure the street designs and best practices set forth in the Complete Street program handbooks can be implemented in local planning and project development. Title 1 of the RTFP also provides direction on limiting new street connections and bike and pedestrian accessways that cross water resources. As of February 2023, all cities and counties were in compliance with these functional plan provisions.
- **Metropolitan Greenspaces Master Plan** – Adopted in 1992 by the Metro Council, provides a vision for a regional system of parks, natural areas, greenways, and trails and identifies 57 urban natural areas and 34 trail and greenway corridors that define the green infrastructure for wildlife and people in the Portland metropolitan region.
- **Parks and Nature System Plan** – Adopted in 2016 by the Metro Council, the Parks and Nature System Plan spells out Metro’s role in protecting clean water, restoring fish and wildlife habitat and connecting people with nature close to home – and sets priorities for this unique park system into the future. The plan also describes Metro’s 17,000-acre portfolio of parks, trails, natural areas and historic cemeteries.
- **Regional Natural Areas Acquisition program** – Initiated in 1996 and expanded in 2006 and again in 2013 and 2016, directs Metro to purchase natural areas, trails and



greenways to be held for future use as open space, parks, trails and fish and wildlife habitat. More than 17,000 acres and 90 miles of river and stream banks have been acquired by Metro since the program was initiated. In addition, Metro has investment more than \$90 million to support a broad range of community nature projects across greater Portland, helping to preserve land, restore habitat, build visitor amenities, expand nature education programs and provide outdoor experiences for historically marginalized communities.

- **Nature in Neighborhoods Initiative (Title 13)** – Includes Metro’s fish and wildlife protection program, conservation education, and restoration.
- **Nature in Neighborhoods Title 13 Performance Evaluation (2016)** – Recommends continued support and investment in The Intertwine Alliance’s Regional Conservation Strategy, continued local government compliance with Title 13, ensure that Title 13 policies are implemented in future urban growth boundary expansion areas and commit Metro to a 2025 review (or earlier) of the Title 13 environmental indicators.
- [Regional Conservation Strategy](#) – The Intertwine Alliance published the Regional Conservation Strategy in 2012 as a way to identify high value habitat and develop strategies to promote effective protection and enhancement of the region's fish and wildlife habitat, water quality, and other vital ecosystems services through strong, clear vision and strategic, science-based approaches. When combined with its companion document, the Biodiversity Guide for the Greater Portland-Vancouver Region, the Regional Conservation Strategy presents a shared understanding of the nature of our region. It defines the challenges facing local wildlife and ecosystems and offers a vision, framework and tools for moving forward collaboratively to protect and restore our natural systems. The Intertwine Alliance is a coalition of more than 140 private firms, public agencies and nonprofit organizations. Representatives from Alliance partner organizations collaborated for 2 years to create the Regional Conservation Strategy (with its supporting Biodiversity Guide for the Greater Portland-Vancouver Region) to guide the expansion, restoration and management of The Intertwine—the region’s network of parks, trails, natural areas and watersheds. The Alliance has also produced management tools, research and best practices resources on urban forestry, public engagement and other topics to advance Regional Conservation Strategy goals. This includes:
  - **Regional Urban Forestry Assessment** – Completed in partnership with the Audubon Society and Portland State University.
  - **Intertwine trail counts and survey data** – Every September since 2008, volunteers count and survey people who are biking and walking the Intertwine – the region’s trails, parks and natural areas – using nationally standardized surveying and recording methods. The count is part of the National Bicycle and Pedestrian Documentation

Project’s annual gathering of trail use data at over 90 sites nationwide. Sites are selected by their link to current or future trail projects.

- **Wildlife corridors and connectivity inventory** – The Regional Connectivity Work Group (RCWG) was formed in 2016 to identify key habitat areas and the best remaining, feasible connections between these “anchor” habitats. The group’s mission is to “understand, create, and protect connectivity to support an ecologically viable, interconnected habitat system for native fish, wildlife, and plants that allows for healthy populations, safe movement and migration across rural and urban landscapes.” The RCWG has created a Connectivity Toolkit that uses GIS to identify wildlife habitat areas and potential connectivity zones, followed by ground-truthing to assess habitat conditions and potential barriers to wildlife movement. The group is currently writing a strategic action plan, which includes a collaborative process for prioritizing the most important remaining habitat and connectivity areas for conservation.
- [Wildlife Corridors and Permeability](#) – a literature review<sup>67</sup> (April 2010)
- **Oregon white oak distribution inventory**<sup>68</sup> – The Regional Oak Prairie Work Group (OPWG) was formed in 2012 to address conservation needs for declining Oregon white oak habitats and associated species. Only approximately 8 percent of Oregon white oak remains in the Willamette Valley. Oregon white oak is a Habitat of Concern under Metro’s Title 13 and a high priority for many agencies and conservation organizations. The group has just completed mapping Oregon white oak on the Oregon side of the Portland-Vancouver Regional Conservation Strategy and the data is publicly available. The OPWG recently completed a Strategic Action Plan, which will guide the group’s future collaborative efforts including identifying high priority areas for future conservation. The OPWG coordinates a regional partnership of over 30 public agencies, park districts, non-profits and community-based organizations.
- **Indigenous and Native American Tribes Legacies** – Metro regularly hires a consultant to check Metro-owned sites for Indigenous and Native American Tribes legacies. Metro has developed an application process for the use of cultural resources and public lands that are managed by Metro (such as Metro’s parks and natural areas).

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<sup>67</sup> <https://www.oregonmetro.gov/sites/default/files/2019/08/22/wildlife-corridors-and-permeability-report-April-2010.pdf>

<sup>68</sup> There are several ways to access or view the Oregon white oaks habitats data.

Metro download: <https://oregonconventioncenter.sharefile.com/d-s472cac9545048b09>

ESRI Story Map tool: View the oak data in different ways, including points, oak patch polygons, oak density by two different grid cell sizes, as well as historic vegetation and the top 25% of the Regional Conservation Strategy high value habitat. See <https://arcg.is/1OaCCO>

Data Basin download : <https://databasin.org/maps/813aa1c6e5834a44b5844a07ed1b93ae>

Intertwine Alliance data link: <https://www.theintertwine.org/projects/oak-prairie-work-group>

Members of Native American Tribes and Indigenous communities have the option to bypass this application by coordinating directly with Metro’s Indigenous Community Liaison.<sup>69</sup> Additionally, Metro works in partnership with the regional Native American Community Advisory Council to host special events and opportunities for community members to access First Foods and cultural resources in regional parks and natural areas.

- **Metro Culvert Inventory** – Identifies areas where fish passage was blocked. Because this data has not been updated since 2002, Metro relies on culvert data maintained by the Oregon Department of Fish and Wildlife for planning projects.
- **Wildlife Hotspot Crossing Inventory** - In August, 2002, Metro completed a study that compiled wildlife mortality data for the three-county portion of the greater Portland region. It used several sources, including: city, county and state road maintenance department road kill pick-up records; ODOT’s Crash Analysis and Reporting Unit; County animal control agencies; and animal care and rehabilitation centers. The study reported more than 2,000 deer and elk deaths between 1992 and 2001 due to collisions with vehicles. The analysis began with a wider scope but was restricted to elk and deer due to limitations of available data—many agencies do not consistently report other wildlife mortalities. Due to the age and limitations of the wildlife hotspot incident data, this information is ancillary rather than comprehensive in nature. In a second study in 2005, the Oregon Department of Transportation used an expert-opinion approach to identify 86 hot spots along state maintained roads in ODOT Region 1. Most of these hot spots are locations where deer-vehicle collisions are frequent, although the experts also identified hot spots that served as crossing locations. ODOT maintains this database and updated the data in 2016 for the 2007-2016 time period for state-owned roadways in the region.
- At the state level, Oregon Department of Fish and Wildlife and Oregon Department of Transportation have undertaken steps to identify wildlife linkages, important wildlife habitat areas that are near or span paved roads. In 2007, Oregon Department of Fish and Wildlife and Oregon Department of Transportation convened workshops to identify these linkage areas. The workshops included state, regional and federal agency staff; transportation maintenance workers and transportation and land use planners. ODOT will combine this information gained from this effort with its wildlife mortality data, daily usage modeling and other information to start identifying possible high priority sites for wildlife crossings. ODFW has just re-started this project to take a

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<sup>69</sup> The Indigenous Community Liaison can be reached at [indigenouscommunityliaison@oregonmetro.gov](mailto:indigenouscommunityliaison@oregonmetro.gov) or 503-517-6981. Additional information can be found here: <https://www.oregonmetro.gov/intertribal-cultural-resources>

more science-based approach. This ODFW project was based on best professional opinion, unlike Metro/PSU's Biodiversity Corridor Toolkit.<sup>70</sup>

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<sup>70</sup> Additional information can be found here:

[https://www.dfw.state.or.us/conservationstrategy/docs/Linkages\\_Report\\_Final\\_2009.pdf](https://www.dfw.state.or.us/conservationstrategy/docs/Linkages_Report_Final_2009.pdf)

Resulting ODFW map link and metadata here:

<https://nrimp.dfw.state.or.us/DataClearinghouse/default.aspx?p=202&XMLname=806.xml>

## Section 5. Recommendations for Future Evaluations

This section provides high level recommended actions that Metro's Planning and Development Department have identified to improve future environmental evaluations and consideration of the mitigation strategies identified in this appendix.

1. Engage federal and state resource, land management, wildlife and other regulatory agencies, Tribes and the Metro Parks and Nature Department early and throughout future Regional Transportation Plan update processes, including the development of the work plan for the next update of the plan and confirmation of data and methods to be used in future analysis.<sup>71</sup> The environmental analysis element of work plan for the next RTP update is contingent on Metro Council and JPACT policy direction and adequate resources and data.
2. Continue to support ongoing coordination between Metro's Planning and Development Department and the Parks and Nature Department.
3. Coordinate with Metro's Nature in Neighborhoods Program on implementation of the recommendations outlined in the 2016 Nature in Neighborhoods Title 13 Performance Evaluation.

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<sup>71</sup> For example, Clean Water Services has commented that including an analysis of impacts to water quality would be appropriate. DEQ data for water quality limited bodies exists in a regional database although there is some additional detail that could be added.

## Attachment 1: Project list assessment fields

An Excel spreadsheet list of projects from the 2023 RTP ‘flags’ projects that intersect with or fall within a 100-foot buffer of the data listed in **Table 12** is available on the RTP project webpage. Fields with a “1” indicate that the project intersects with the data. Fields with a “0” indicate that the project does not intersect/fall within the 100-foot buffer. Projects not included in the analysis because they are not geolocated, indicate “Not Evaluated” in the field. **Table 15** can be used to decipher the field names in the list of projects.

**Table 15 Field names for list of projects**

Environmental Concern Area Name	Field Name in Excel Spreadsheet
Regional Conservation Strategy High Value Habitat Areas	Result_rcs
Title 13 Habitat Conservation Areas	Result_title13
Oak Prairie High Priority Area	Result_oak
Potential Habitat Connectivity (Omniscape) - low, med, and high	Result_habConnect_lowMedHigh
Urban Heat Island	Result_uhi
Wildlife Collisions (ODOT Highways)	Result_roadkill
Conservation Opportunity Areas	Result_coa
All Fish-Bearing Streams	Result_all_fish
Fish Passage Barriers	Result_barriers
Priority Fish Passage Barriers	Result_priority_barriers
Title 3 Land	Result_title3
Wetlands	Result_wetlands
FEMA Flood hazard areas	Result_floodplain
Historic properties data from the National Register of Historic Places	Result_historic_places
All rivers and streams in the planning area	Result_streams
Essential salmonoid habitat	Result_salmon
February 1996 flood levels	Result_flood96
Potential Habitat Connectivity (Omniscape) - med and high	Result_habConnect_medHigh
Equity Focus Areas	Result_efa
Equity Focus Areas - people of color	Result_efa_bipoc
Equity Focus Areas - limited English proficiency	Result_efa_lep
Equity Focus Areas - low income	Result_efa_li

## Attachment 2: Transportation Funding Opportunities for Habitat Connectivity

Created April 2023 by Erin Abernethy (US Fish and Wildlife Service), reviewed by Rachel Wheat (Oregon Department of Fish and Wildlife).

*BIL = Bipartisan infrastructure law; HB = House Bill*

*Blank cells were unknown at the time of document creation*

**Table 16 Transportation Funding Opportunities for Habitat Connectivity**

Grant program	Funder	Max Award or Total Amount	Current Deadline	Year Ends	Funding Focus	Website
HB 4130 (wrapped into budget in HB 5202 and passed)	Oregon Legislature	\$7 M (total amount)	Not a competitive process		Projects that will reduce wildlife-vehicle collisions and improve wildlife habitat connectivity throughout Oregon. Funding went directly to ODOT for use.	<a href="#">Link1</a> <a href="#">Link2</a> (HB 5202 text and tracking)
HB 2999 (Feb 27, 2023: Referred to Ways and Means, not passed yet)	Oregon Legislature	\$5 M (total amount)	Not passed yet		Bill tasks Oregon Department of Transportation wildlife-vehicle collision program to describe and make recommendations for ongoing funding strategy for program. Directs State Department of Fish and Wildlife to carry out projects to support species mobility and habitat connectivity.	<a href="#">Link</a> (HB 2999 text and tracking)
Oregon Conservation and Recreation Fund	Oregon Department of Fish and Wildlife	\$50,000 (max award)	March 27, 2023	No end	Projects that protect and enhance the species and habitats identified in the Oregon Conservation Strategy and create new opportunities for wildlife-associated recreation. Projects that have a clear nexus with drought, wildfires, and aquatic resilience were prioritized for funding in the March 2023 call for proposals.	<a href="#">Link</a>

Grant program	Funder	Max Award or Total Amount	Current Deadline	Year Ends	Funding Focus	Website
Many	Oregon Watershed Enhancement Board	\$15,000 to over 100k (max awards vary by grant)	Varies	No end	Overall purpose to restore watersheds and habitat for native fish or wildlife, includes crossing projects. Grant programs for land, coastal, and water acquisition, emergency post-fire restoration and drought relief, monitoring, restoration, stakeholder engagement, technical assistance, supporting operating capacity and collaboration, creation of strategic plans, incentives for conservation focused agriculture.	<a href="#">Link</a>
America the Beautiful	National Fish and Wildlife Foundation	\$91 M in 2022 / \$1 B (total amount through 2027)	April 20, 2023	2027	For locally led ecosystem restoration projects that invest in watershed restoration, resilience, equitable access, workforce development, corridors and connectivity, and collaborative conservation, consistent with the America the Beautiful Initiative.	<a href="#">Link1 (Funding website)</a> <a href="#">Link2 (Press release)</a>
Urban and Community Forestry Program	Forest Service (USDA)	Min \$100 K, max \$50 M (award) / \$1.5 B (total amount)	May 2023		A technical, financial, and educational assistance program, delivering nature-based solutions to ensure a resilient and equitable tree canopy in urban areas.	<a href="#">Link</a>
Many	BIL/ Federal Highways	\$350 B (total amount through 2026)	Varies	2026	Used to fund various types of transportation projects and activities.	<a href="#">Link1 (Competitive Grants)</a> <a href="#">Link2 (Funding Authorizations)</a>
Federal Lands Access Program	BIL/ Federal Highways	\$292 M (total amount in 2023)		2026	Improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands.	<a href="#">Link1 (General info)</a> <a href="#">Link2 (BIL fact sheet)</a>
Wildlife Crossings Pilot Program	BIL/ Federal Highways	\$350 M (total amount through 2026)		2026	Reduce motorist-wildlife collisions and provide better habitat connectivity.	<a href="#">Link</a>



<b>Grant program</b>	<b>Funder</b>	<b>Max Award or Total Amount</b>	<b>Current Deadline</b>	<b>Year Ends</b>	<b>Funding Focus</b>	<b>Website</b>
National Culvert Removal, Replacement & Restoration Grants	BIL/ Federal Highways	Min \$10 K, max \$20 M / \$196 M (total amount in 2023)	February 6, 2023	2026	Projects for the replacement, removal, and repair of culverts or weirs that meaningfully improve or restore fish passage for anadromous fish.	<a href="#">Link</a>
Nationally Significant Multimodal Freight and Highway Projects	BIL/ Federal Highways	\$8 B (total amount through 2026)		2026	Eligible projects expanded to include wildlife crossing projects.	<a href="#">Link</a>
Bridge Investment Program	BIL/Federal Highways	\$2.5 B (total amount in 2023)		2026	Eligible projects include “a project to replace or rehabilitate culverts of the purpose of improving flood control and improved habitat connectivity for aquatic species.”	<a href="#">Link</a>
Surface Transportation Block Grant Program	BIL/Federal Highways	\$14 B (total amount in 2023)		2026	Eligible projects expanded to include projects and strategies designed to reduce the number of wildlife-vehicle collisions, including project-related planning, design, construction, monitoring, and preventative maintenance.	<a href="#">Link</a>

### Attachment 3: Metro Urban Heat Island Index Methodology

The four-county Metro Urban Heat Island (UHI) index – including Washington, Multnomah, and Clackamas counties in Oregon, and Clark County in Washington – was derived from fifteen Landsat 8 Collection 2 Analysis Ready Data (ARD) images, utilizing measurements of surface temperature from band 10.

The images were selected between the years of 2016 and 2020, and between the months of May and October. The images were selected for having less than 2.6% cloud cover. Areas of cloud cover were removed from the analysis using the QA band.

A mean surface temperature raster was created using the mean of each pixel location across all fifteen images, excluding pixel values with cloud cover. Mean and standard deviation statistics were derived for the four-county area, which were then used to create a Z-score UHI index.

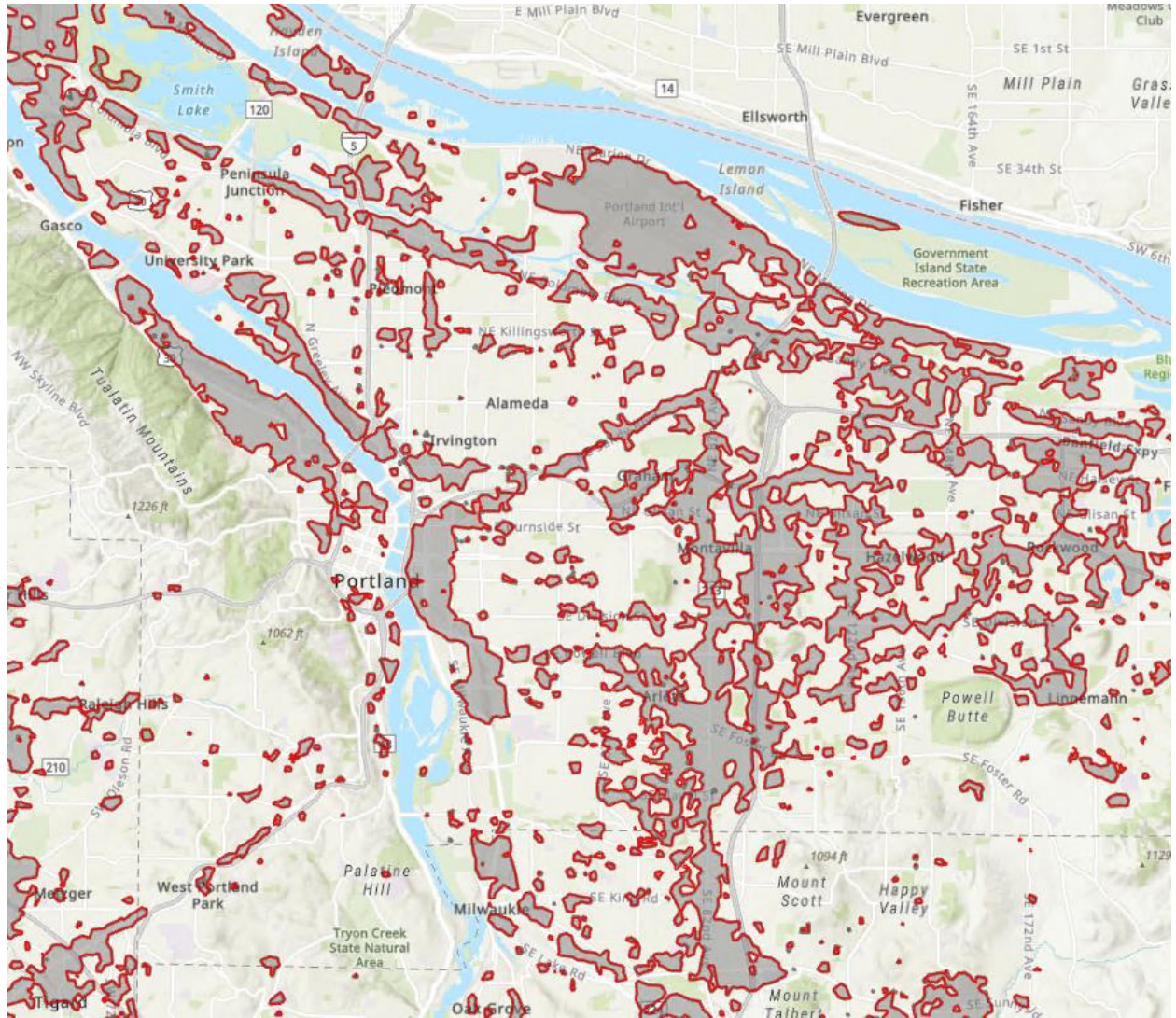
The four-county area was clipped to the metropolitan planning area (MPA) boundary, and the UHI index scores were ranked by quintiles. The top quintile – or top 20% of UHI index values – were selected to represent the areas with the highest susceptibility to extreme urban heat conditions.

The following table shows the individual collection dates for the Landsat 8 imagery, along with associated daily high temperature data collected at the Portland International Airport (PDX).

Landsat Collection Date	Temperature at PDX Airport
6/25/2016	78
7/27/2016	88
8/12/2016	97
9/13/2016	81
5/27/2017	89
7/14/2017	85
7/30/2017	87
5/14/2018	89
7/17/2018	90
8/18/2018	87
5/1/2019	69
7/20/2019	87
8/5/2019	91
10/24/2019	68
8/23/2020	83
Average	85

To test the effect of including lower temperatures, a UHI index was created using only temperatures that exceeded 85 degrees. The two indices – one with all fifteen images, the other with ten images above 85 degrees – had a Pearson’s correlation of 0.997 and an R-squared of 0.994. In other words, they were almost identical.

The following image shows the top quintile of the unfiltered 15-image index in gray, overlaid with red lines for the top quintile of the filtered 10-image index.



## **Attachment 4: DRAFT Regional Transportation Plan Habitat Connectivity Assessment Report**

A draft report developed by Metro Parks and Nature staff in collaboration with the Regional Conservation Habitat Working Group (RCHWG).



If you picnic at Blue Lake or take your kids to the Oregon Zoo, enjoy symphonies at the Schnitz or auto shows at the convention center, put out your trash or drive your car – we’ve already crossed paths.

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**Metro Council President**

Lynn Peterson

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