Port of Portland

2022 Lower Willamette River Basin Total Maximum Daily Load Progress Report

REPORT | Prepared for
Oregon Department of Environmental Quality

Submitted January 27, 2023

PORT OF PORTLAND

Table of Contents

List of Abbreviations and Acronyms

BHCP	Backyard Habitat Certification Program
CAC	Community Advisory Committee
CDC	Community Development Corporation
City	City of Portland
CWSC	Columbia Slough Watershed Council
DEQ	Oregon Department of Environmental Quality
DMA	Designated Management Agency
EMSWCD	East Multnomah Soil and Water Conservation District
EPA	United States Environmental Protection Agency
FOT	Friends of Trees
IGA	Intergovernmental Agreement
MYC	Multnomah Youth Cooperative
NPDES	National Pollutant Discharge Elimination System
PDX	Portland International Airport
PIC	Portland International Center
Port	Port of Portland
ROD	Record of Decision
RP	Responsible Party
TIP	TMDL Implementation Plan
TMDL	Total Maximum Daily Load
WQMP	Water Quality Management Plan

Section 1

Introduction

This Total Maximum Daily Load (TMDL) annual progress report is submitted to the Oregon Department of Environmental Quality (DEQ) as a requirement of the Willamette Basin TMDL. In September 2006, DEQ issued a TMDL for the entire Willamette River Basin to protect and restore the beneficial uses of the Willamette River. The Willamette River TMDL is the largest TMDL undertaken by the DEQ thus far, pertaining to all sub-basins. Mercury, bacteria, and temperature are the three main pollutants addressed in the TMDL. This 2022 TMDL Progress Report presents the Port's actions in support of its 2019 TMDL Implementation Plan (TIP).

The Port of Portland (Port) owns property within the Lower Willamette River sub-basin of the Willamette River Basin, therefore, the Willamette River TMDL identifies the Port as a Designated Management Agency (DMA) for TMDL pollutants in the Lower Willamette River and the Columbia Slough. With the exception of temperature, the applicable TMDL pollutants are regulated by the Port's National Pollutant Discharge Elimination System (NPDES) Permits and progress on addressing those pollutants is covered in the Port's NPDES Permit annual reports. However, the Willamette River TMDL specifically states that temperature is not considered to be a stormwater issue; therefore, management strategies for temperature are generally not required in municipal or industrial stormwater permits. As a DMA, the Port is responsible for developing and implementing a TIP that describes the management strategies the Port will undertake to control non-point source pollution arising from land use activities under its jurisdiction with respect to temperature.

This 2022 TMDL Progress Report presents the Port actions in support of its 2019 TIP. The 2019 TIP is focused on the water temperature in the Columbia Slough (See Appendix C, Figure 1) and is required to be revised every five (5) years. The Port and the City of Portland collaboratively work with the Columbia Slough Watershed Council to identify and implement habitat, water quality, and revegetation projects through the Airport Futures National Resources Enhancement Project. In addition, the Port has worked with the United States Environmental Protection Agency (EPA), DEQ, Metro, the City of Portland (City), and other third parties to develop restoration sites as part of the Portland Harbor Superfund Site work.

This 2022 TMDL Progress Report provides detail on the plan elements addressing temperature through the funding of new natural resources enhancement projects in the Columbia Slough watershed, and maintenance of existing mitigation and revegetation areas previously restored by the Port. Appendix A provides *Table A-1: TMDL Implementation Plan Tracking Matrix* for temperature.

Section 2

Columbia Slough Enhancement Projects

The Port has engaged in a collaborative planning effort (*Airport Futures Natural Resources Program*) with the City of Portland and the Portland-Vancouver metropolitan community to create an integrated development plan for Portland International Airport (PDX). As a result of this public process, the Port has entered into an Intergovernmental Agreement (IGA) with the City of Portland committing to completing or funding work that promotes Columbia Slough watershed health, tree canopy goals, and other natural resource enhancements. The Airport Futures Natural Resource Program supports the Willamette River Basin TMDL objectives, the Port's obligations as a DMA, and its goal to maintain public involvement in enhancement projects moving forward. This commitment has resulted in new vegetation, revegetation, water quality, and habitat enhancement projects near PDX within the Columbia Slough Watershed.

The IGA requires the Port to fund $20,000 in urban tree canopy enhancements and an additional $30,000 in Columbia Slough Watershed enhancements per year, with a 3% annual increase, for 25 years, starting in 2012 (in 2022, $67,195 was spent). Slough enhancement projects include efforts that accomplish revegetation on the Columbia Slough, removal of invasive species, improved hydrologic connectivity, or increased summer base flow. Potential projects are reviewed and recommended by the natural resources sub-committee of the Community Advisory Committee (CAC). This sub-committee recommends projects to the CAC for Airport Future funding. The CAC is made up of a diverse regional representation including stakeholders such as the City of Portland and the Columbia Slough Watershed Council (CWSC). Airport Futures Natural Resources Enhancement projects that provide a temperature reduction benefit are included in the Port's TMDL Implementation Plan reporting. In 2022, the Port funded $26,878 for canopy enhancements and $40,317 for slough enhancements through this program, totaling $67,195. The projects that were funded in 2022 are the second year of the Columbia Slough Watershed Council Stewardship Enhancement Project ($7,491) and the Greening Wilkes Project ($59,704) which combines the remaining slough enhancement funding with the canopy enhancement funding into one larger project with both slough and canopy enhancement components. These projects are described in detail below. These projects are described in detail below in Section 2.2.

2.1 Project Selection Update

The PDX CAC receives annual updates on canopy and Columbia Slough enhancement projects and votes to select new projects for funding. The Port continues to work with a natural resources sub-committee of the CAC to identify potential projects. The following are the project criteria used to prioritize projects for funding:

1. Contributes to water quality.
2. Contributes to hydrologic improvement.
3. Contributes to habitat enhancement.

Additional consideration is given to a project that also provides:

1. Community impact.
2. Social equity (i.e., underserved youth; minority and women emerging small business participation).
3. Multiple objectives.
4. Matching/leverage with other resources and multiple partners.
5. Long-term commitment to maintenance and monitoring.

All projects must also meet the following basic requirements:

1. Consistency with other plans and regulatory requirements.
2. Airport compatibility (Wildlife Hazard Management Plan).
3. Written landownership permission if the project proponent is not the landowner.

2.2 2022 Projects

In 2022, the Port contributed to two projects:

- CWSC Stewardship Enhancement Project
- Greening Wilkes Project

These projects are described in Sections 2.2.1 and 2.2.2.

2.2.1 Columbia Slough Watershed Council's Stewardship Enhancement Project ($7,491)

The CSWC Stewardship Enhancement project was partially funded in 2021 with the remaining funding issued in 2022. The project continued to maximize prior investments at four existing enhanced sites. The goal of the project is to build resilience at the sites through invasive species removal, native planting, habitat enhancement, and bank stabilization to reduce erosion.

This project supports the development of green workforce skills through mentoring and contracting with Multnomah Youth Cooperative (MYC), Mudbone Grown, VoZ, Wisdoms of Elders, and Blueprint Foundation. In addition, the work included volunteer engagement with Stewardship Saturday events.

CSWC stewardship enhancement work occurred on four slough enhancement projects that were previously completed. The CSWC continues to actively manage this work; however, the initial grant funds have been spent. The Airport Futures funding provided an opportunity to do additional activities. The funding was allocated to the following projects:

- **Buffalo Slough** – Wisdom of the Elders worked on invasive species removal and plantings. MYC and CSWC Project Zero interns installed 500 plants during the winter of 2022.
- **NE 33rd Ditches** – Invasive species removal; established plantings from three years ago were caged to protect from beaver herbivory; MYC installed 730 plants; Project Zero interns installed and mulched 200 plants and mowed the north site in spring of 2022 to daylight recent plantings. In summary, a total of 930 plants were installed at the NE 33rd Ditches in 2022.
- **OWEB Site** – The OWEB site is located at a Portland Water Bureau pump station near NE 166th and Airport Way. Project activities included conducting riparian restoration in the upper Columbia Slough. A corporate volunteer group installed 450 plants. Northwest Youth Corps provided a crew of eight for two days of mowing and teasel/blackberry grubbing. MYC installed 160 plants, spread two (2) cubic yards of mulch and cut/grub 1,000 square feet of blackberries.
- **NE 112th Ave in Parkrose** – Wisdom of the Elders and Northwest Youth Corps have both been doing invasive species management at NE 112th Ave in Parkrose. CSWC hosted Youth

for Parkrose and members of the public for a planting event on February 14, 2022. Volunteers planted 350 plants and removed three garbage bags of trash. Ten youth, who live in the neighborhood, gained paid experience learning about native plants, the Columbia Slough and green jobs. Project Zero interns spent 24 hours removing blackberry and ivy from newly planted areas. Wisdom of the Elders grubbed blackberry and pulled ivy on 24,000 square feet. In November 2022, CSWC and Youth for Parkrose partnered for another paid planting and workforce development day on the site. The goal was to connect youth from Parkrose High School to their neighborhood's natural resources and expose them to new career paths.

2.2.2 Greening Wilkes Project ($59,704)

The Greening Wilkes Project combined both canopy and slough enhancement funds into one larger project with multiple partners to meet objectives for greater benefit. This was a collaborative project led by community based environmental non-profits, CSWC, Friends of Trees (FOT), Portland Audubon and Verde.

The project included elements of environmental restoration, green infrastructure improvements, and community programming to the Wilkes Creek Headwaters/Natural Area and its surrounding neighborhood. Located in outer East Portland, Wilkes Creek Headwaters contains the springs that feed the only free flowing stream in the City of Portland that flows into the Columbia Slough. While the centerpiece of this proposal is habitat restoration of the headwaters and connected riparian corridor, the project was an important extension along neighborhood streets, to adjacent multifamily apartment complexes and individual backyards to connect habitat and community together in the broader watershed. A summary of what was completed by each non-profit is included in Sections 2.2.2.1 through 2.2.2.4.

2.2.2.1 Columbia Slough Watershed Council

In 2022 the CSWC conducted the following work in the Wilkes Creek Headwaters Natural Area:

- Wisdom of the Elders mowed 0.5 acres of blackberry and volunteers removed ivy from the same 0.5 acres of the natural area.
- Teen Service Corps and Wisdom of the Elders removed blackberry and conducted planting prep.
- 28 community members planted 452 plants at Wilkes Creek Headwaters.

Community Outreach

- CSWC canvased 48 households in the neighborhood, met with the Riverview Village HOA president and Argay Neighborhood Association chair.

2.2.2.2 Audubon Society of Portland

Outreach and Recruitment for Community Participation in the Backyard Habitat Certification Program (BHCP):

Audubon started targeted outreach and recruitment of residents at events, meetings, and through door-to-door canvassing in preparation for enrollment that occurred in late summer and fall of 2022. Outreach was focused on the Wilkes Park natural areas and headwaters.

Nature Walk with Community as Part of Earth Day (April 23, 2022):

Portland Audubon staff along with our Green Leaders (a youth leadership program in partnership with Hacienda Community Development Corporation (CDC)) led a community event that included educational tabling, activities, refreshments, and a guided nature walk from Wilkes Park through the community to Wilkes Headwaters.

2.2.2.3 Verde

Verde staff have been supporting the collaborative effort around community engagement by helping with distributing flyers and door knocking and supporting the Earth Day event on April 23, 2022.

Fall 2022:

In the Fall of 2022, Verde worked with the Backyard Habitat Certification Program to identify homeowners where three rain gardens were installed. Verde also taught local youth the *Naturescape* curriculum in the Fall of 2022.

2.2.2.4 Friends of Trees

Friends of Trees conducted multiple planning events through 2022 as described in Section 2.2.2.4.

Wilkes Creek Headwaters Planting on 2/12/22:

With the help of 65 community members, 950 native species were planted. These plantings included Tall Oregon Grape, Oceanspray, Common Camas, Western Serviceberry, Nootka Rose, and Thimbleberry.

Community Tree Planting throughout Wilkes on 1/22/22:

With the help of 100 community members, 75 trees and 100 plants were planted on private property. These plants were obtained from the cancelled East Multnomah Soil and Water Conservation District (EMSWCD) sale.

Community Tree Care on 1/8/22: With the help of 15 Pruning Leaders, 98 street trees were pruned throughout the Wilkes neighborhood.

Wilkes Creek Headwaters Tree Care on 4/23/22: With the help of 39 volunteers, ten yards of mulch was spread over 1,500 native plants.

Section 3

Revegetation and Mitigation Site Management

The Port has participated in the establishment of many native plant revegetation and mitigation sites along the Columbia Slough. As these projects mature, they will help increase the amount of shade and stormwater infiltration contributing to lower water temperature in the Columbia Slough during the critical summer months. Invasive plant species are a real threat to the health of these areas. The Port has made a commitment to continued management of these sites through invasive species management and replanting to ensure native plants provide the intended shade and habitat benefits for the Columbia Slough.

3.1 Management Activities

The 2019 TIP detailing the management activities at the Port's mitigation and revegetation projects is described in Table B-1, Appendix B. The locations of the mitigation sites are included in Figures 1 through 5, Appendix C. The maps also indicate constraints impeding further revegetation (described in the Port's 2019 TIP) and give a brief project description. In 2022, a total of 19,630 plants were installed at nine (9) separate sites. Figures 6 and 7 in Appendix D include Airport Futures Natural Resource Enhancement Projects.

Management activities are focused on providing the most efficient approach to protect the investment made at these sites. Sites are inspected regularly; invasive species removal or other actions are used to ensure the plantings are not impacted. The Port manages these areas based on an integrated pest management approach outlined in the Port of Portland Vegetation Management Plan for Mitigation Natural Areas, last updated in August 2021.

Section 4

Portland Harbor Superfund Site Cleanup Program

The Portland Harbor Superfund site is an 11-mile stretch of the Willamette River located between the Broadway Bridge and its confluence with the Columbia River. The Portland Harbor was listed on EPA's National Priorities List (Superfund) in December 2000. Shortly after the initial listing, the Port was listed as a potentially Responsible Party (RP) for the Portland Harbor Superfund Site Cleanup Program. Since that time, the Port has proactively initiated remediation and restoration efforts throughout the Portland Harbor. On January 6, 2017, the Portland Harbor Superfund Site reached a key milestone when the EPA released its Record of Decision (ROD), the final plan for cleanup.[1] The Port is currently working with the EPA, DEQ, RPs and others to implement the ROD.

Through the cleanup program, the Port has directly enhanced or purchased habitat restoration credits for approximately 13,460 linear feet of riparian habitat to date.[2] These habitat enhancement and restoration efforts also directly benefit the temperature TMDL by decreasing temperature and are identified in the Port's 2019 TIP as key elements. Project locations are included in Appendix C.

4.1 2022 Program Efforts

The Port received regulatory closure in 2022 on the Dahl Beach Mitigation Project by the EPA. This project was implemented to provide compensatory mitigation for impacts to salmonid critical habitat incurred because of shoreline stabilization activities conducted during the Terminal 4 Phase I Removal Action within Wheeler Bay of the lower Willamette River in 2008. The closure determination by the EPA was based on the project's successful establishment of native vegetation and habitat features. As a result, the Port is no longer required to monitor, conduct maintenance, or provide reporting of the restoration work moving forward. A site protection instrument remains in place for this area to ensure it remains undeveloped and continues to serve environmental mitigation and ecological restoration purposes. This site is now maintained by the City of Gladstone.

[1] www.portofportland.com/superfund

[2] No additional linear feet of riparian habitat were added in 2022.

Section 5

Progress Report Summary

Based on the strategy described in the 2019 TIP, the Port continues to meet its obligations under the Willamette Basin TMDL for temperature by continuing its investment in Columbia Slough watershed health through the Airport Futures Natural Resources Program. The Port will monitor effectiveness of these projects by documenting the status of plantings three years after the completion date. To protect the progress that has been made on the Columbia Slough, the Port will continue to monitor and maintain the mitigation/revegetation sites on its property. This will allow for native canopy growth capable of increasing shade and enhanced groundwater recharge for the Columbia Slough.

Overall accomplishments in 2022 included the following:

- The Port contributed to projects that included the installation of 19,630 native plants at nine (9) Port managed mitigation and restoration areas.
- Columbia Slough Natural Area Trees and Plantings: 452 trees.
- CWSC stewardship enhancement projects completed at four sites:
    - Buffalo Slough – 500 plants installed.
    - NE 33rd Ditches – 930 plants installed.
    - OWEB Site –
        - 450 plants installed by corporate volunteer group
        - 160 plants installed, two (2) cubic/yards of mulch, and cut/grubbed 1,000 square feet of blackberries by MYC.
    - NE 112th Ave in Parkrose – 350 plants installed, and 24,000 square feet of ivy and blackberry removed.
- Greening Wilkes Project included elements of environmental restoration, green infrastructure improvements, and community programming to the Wilkes Creek Headwaters/Natural Area and its surrounding neighborhood.
    - Columbia Slough Watershed Council
        - 0.5 acres of blackberry and volunteers removed ivy from the same 0.5 acres of the natural area.
        - 452 plants at Wilkes Creek Headwaters.
    - Audubon Society of Portland
        - Targeted outreach and recruitment of residents
        - Lead community events.
    - Verde
        - Installed three rain gardens.
    - Friends of Trees
        - Wilkes Creek Headwaters Planting: 950 native species were planted.
        - Community Tree Planting throughout Wilkes: 75 trees and 100 plants were planted on private property.

- Community Tree Care: 98 street trees were pruned throughout the Wilkes neighborhood.
- Wilkes Creek Headwaters Tree Care: Ten yards of mulch was spread over 1,500 native plants.

Section 5.1 TMDL Implementation Plan Update

In February 2021, the EPA adopted DEQ's 2019 Final Revised Willamette Basin Mercury TMDL and WQMP document. In September 2022, the Port submitted an updated TIP document to reflect the requirements of the WQMP and updated management strategies to improve water quality. On December 1, 2022, DEQ approved the Port's updated 2022 TIP. The 2022 TIP will be used as the basis for 2023 TMDL annual reporting. In addition, the Port will be conducting its Five Year TMDL Report update in 2023 that is due to DEQ on January 31, 2024.

Appendices

A TMDL Implementation Plan Tracking Matrix (Table A-1)

B Mitigation/Revegetation Site Management Activities (Table B-1)

C Mitigation/Revegetation Site Maps (Figures 1 through 5)

D Airport Futures Natural Resource Enhancement Projects (Figures 6 through 7)

Appendix A: TMDL Implementation Plan Tracking Matrix (Table A-1)

Table A-1. TMDL Implementation Plan Tracking Matrix

POLLUTANT: Temperature

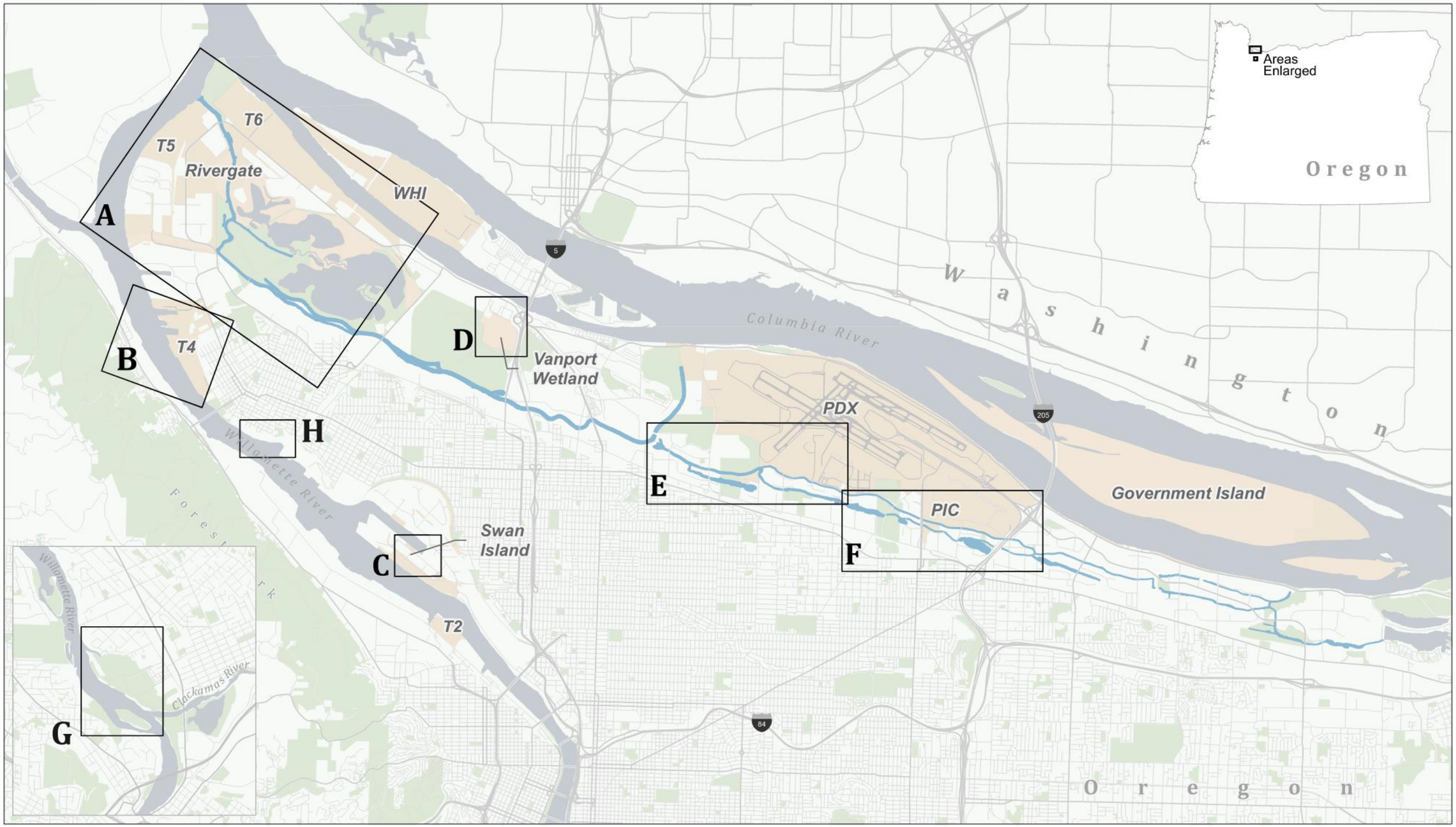
Source	Strategy	How	Fiscal Analysis	Measure	Timeline	Milestone	Status
What sources of this pollutant are under your jurisdiction?	*What is being done, or what will you do, to reduce and/or control pollution from this source?*	*Specifically, how will this be done?*	*What is the expected resource need? Are there existing resources budgeted? If not, where will the resources come from?*	*How will you quantitatively or qualitatively demonstrate successful implementation or completion of this strategy?*	*When do you expect it to be completed?*	*What intermediate goals do you expect to achieve, and by when, to know progress is being made?*	*Include summary and date.*
1. Land use activities under the Port's jurisdiction.	a. Continued maintenance of Port-owned revegetation and mitigation sites to prevent invasive plants from impacting maturation of native plantings.	Annual inspection and maintenance of these sites.	Existing resources are budgeted annually for this work.	Annual maintenance activities for each site are recorded.	Annually.	Completion of necessary maintenance to minimize impact of invasive plants on project sites annually.	On-going. *See Appendix B for work completed in 2022. Ongoing work is reported in the Annual Progress Report in Appendix B.
	b. Fund Airport Futures Natural Resources Enhancement Projects that address temperature in the Columbia Slough. This funding can be used for projects on Port properties and properties not owned by the Port. The implementing agreement is the Airport Futures Natural Resources IGA between the Port and the City of Portland.	The Port is working with a broad stakeholder group to develop and implement a list of potential Columbia Slough watershed projects. Projects are selected by the Community Advisory Committee (CAC) consisting of the Port, City of Portland, Columbia Slough Watershed Council, and other stakeholders. In 2022, $67,195 worth of projects were funded. This includes the Columbia Slough Watershed Council Stewardship Enhancement Project ($7,491) and the Greening Wilkes Project ($59,704).	Existing resources are budgeted for projects through 2035, with an annual 3% escalation rate.	Document the projects completed during the previous year and provide information on the projects approved for the next year.	Canopy enhancement projects in the watershed will be completed annually. New Columbia Slough enhancement projects will be completed when property owner approval and full funding can be obtained.	Development of a prioritized potential project list. Project completion (based on property owner approval).	The project list was completed in 2012 and is revisited annually to select projects and add any new projects that are identified. Implementation of available projects is on-going. All unconstrained Port revegetation sites on the Columbia Slough were addressed in 2001 and are now managed under item a. above. Future project sites will primarily be located on properties not owned by the Port. All current and future projects are listed in the Appendix C maps.

Appendix B: Mitigation/Revegetation Site Management Activities (Table B-1)

Table B.1 Port-Managed Mitigation, Revegetation and Enhancement Projects-2022			
Location Number	Project Name	Year completed	Maintenance Activities
1	Columbia Grain Revegetation Project	2000	Maintenance did not occur at this site in 2022.
2	82nd Avenue to 92nd Avenue Revegetation Project	2000	Maintenance did not occur at this site in 2022.
3	92nd Avenue to I-205 Revegetation Project	2000	Installed beaver protection fencing around priority trees. Caged all trees 6" dbh and above, or if it looked like the tree presented danger to the overhead lines or adjacent fences (January). Installed 500 native bareroot/container plants in open areas (February).
4	Cornfoot Road	2000	Maintenance did not occur at this site in 2022.
5	PDX Port Maintenance Building Revegetation Project (Meyers Marx)	2000	Maintenance did not occur at this site in 2022.
6	North Marine Drive Overpass Revegetation Project	2000	Maintenance did not occur at this site in 2022.
7	Alderwood Slough Revegetation Project	2000	Maintenance did not occur at this site in 2022.
8	Alderwood Corner Revegetation Project	2000	Maintenance did not occur at this site in 2022.
9	Buffalo Street Mitigation Site	1994 & 2003	Planted 800 native shrubs along the Columbia Slough (February). Treated blackberry in areas where plants were installed (August).
10	PDX Economy Lot E-zone Conversion Project	Ongoing	Maintenance did not occur at this site in 2022.
11	Elrod Road Mitigation Site	1994	Treated large blackberry patches; sprayed ivy and holly (January). Interplanted a portion of the "back-40" area with 1,125 native shrubs (March). Treated back-40 area for blackberry and thistles (August).
12	Terminal 5 Powerline and West Wye Mitigation Sites	1995-2001	T5: Planted 500 native shrubs (February). West Wye: Mowed (October).
13	Vanport Wetlands Mitigation Site	2000-2006	Planted native shrubs on the west side of wetland; 200 C douglasii, 250 F. latifolia, 700 L. involucrata, 200 M. aquifolium, 250 P. capitatus, 300 R. sanguineum, 100 R. pisocarpa, 300 R. parviflorus, 700 R. spectabilis, 200 S. cerulea, 200 S. racemosa, 600 S. douglasii, 600 S. albus (February). Planted 7 ball and burlap size oaks (1.25'-1.5' caliper) in open field area of west side; spot treated east of pumphouse targeting teasel, thistle, poison hemlock and mullein (April). Cut access paths through grass to safely access oak trees for watering; cut grasses in planting area to prep for circle spray treatments. Treated nightshade and pennyroyal in wetland. Watered oak trees. Hand-cut invasive grasses SW of pumphouse; hand-cut grasses south of N. Ditch; target species include tall oatgrass, velvet grass, reed canary grass. Treated nightshade and pennyroyal in wetland, east side. Treated blackberry along access road adjacent to SW Swale. Cleared blackberries from fence in advance of fence repair by McDermott (August). Treated invasive species throughout the site (September). Spot treated west buffer for blackberry, reed canary grass, tansy, teasel, thistle and velvet grass (October).
14	Rivergate Enhancement - North and South Slough Mitigation Site	2003	Maintenance did not occur at this site in 2022.
15	Rivergate Enhancement - Leadbetter Peninsula Mitigation Site	2003	Planted bareroot/gallon plants in RCG Restoration Site: 500 F. latifolia, 350 P. capitatus, 250 R. pisocarpa, 600 S. douglasii, 600 S. albus (February). Used grass-specific herbicide in RCG Restoration Site to treat RCG; treated grasses in dry areas of wetland; treated grasses in C. aperta planting area on south side of wetland. Target primarily RCG (August).
16	Rivergate Enhancement - Ramsey	2004	Planted bareroot/gallon plants in open areas of Enhancement Area and on the islands. 350 C. douglasii, 1050 F. latifolia, 200 L. involucrata, 300 P. capitatus, 200 R. parviflorus, 200 S. douglasii, 500 S. albus (February). Spot treated all islands for birds foot trefoil, teasel, poison hemlock, RCG, thistles (March). Treated invasive species on islands (August and September).
17	Ramsey Lake Mitigation Site	1988	
18	Rivergate Enhancement - 40-Mile Loop Trail Mitigation Site	2004	Maintenance did not occur at this site in 2022.
19	Portland International Center (PIC) E Zone Mitigation Site	2000-02	Maintenance did not occur at this site in 2022.
20	Terminal 4, Berth 408	2001-002	Periodically maintained by Port Marine Maintenance.
21	Terminal 4, Pier 2, Rail Yard Improvements (Willamette Greenway)	2007	Periodically maintained by Port Marine Maintenance.
22	Terminal 4, Toyota Riverbank Restoration Project	2003	Periodically maintained by Port Marine Maintenance.
23	Terminal 5, Berth 503 Bank Stabilization/ Revegetation Project	1997-2001	Periodically maintained by Port Marine Maintenance.
24	Terminal 4, Berth 401 Riverbank Rehabilitation Project	2000	Periodically maintained by Port Marine Maintenance.
25	Terminal 4, Slip 3 Remediation and Revegetation Project	2004	Periodically maintained by Port Marine Maintenance.
26	T-5 Greenway Planting Revegetation Project	2002	Periodically maintained by Port Marine Maintenance.

Table B.1 Port-Managed Mitigation, Revegetation and Enhancement Projects-2022			
Location Number	Project Name	Year completed	Maintenance Activities
27	Force Avenue	2009	Site is mowed each summer.
28	Swan Island Enhancement Project	2017	Construction at this site was completed in 2017. This enhancement project was mitigation for the Swan Island Operable Unit 2 Upland Source Control work.
29	Rinearson Creek/Meldrum Bar Park Restoration Project	2018	Construction at this site was completed in 2018. This site is part of the suite of restoration sites under the Portland Harbor Superfund Natural Resource Damage Assessment. Port purchased credits at this site in 2019.
30	Linnton Mitigation Bank	2019	Construction at this site was completed in 2019. This site is part of the suite of restoration sites under the Portland Harbor Superfund Natural Resource Damage Assessment. Port purchased credits at this site in 2019.
31	T4 Infiltration	2020	Stormwater Treatment Facilities constructed for Basin M and Basin K1. Both facilities reduce pollutant loading to the river by infiltrating 90% of the runoff. Annual inspection and maintenance will be ongoing.
32	Willamette Cove	Projected to be completed in 2023	DEQ Record of Decision issued in March 2021 for final cleanup. Site is in the remedial design phase. Restoration will commence after cleanup.
33	82nd Avenue Oak Woodland Planting	2019	Maintenance did not occur at this site in 2022.
34	McBride Slough	2019	Planted 200 Acer circinatum, 200 Fraxinus latifolia, 100 Ribes sanguineum, 800 Spiraea douglasii (February). Spot sprayed invasive species throughout the site (June).
35	Wheeler Bay Bank Stabilization Project	2008	Periodically maintained by Port Marine Maintenance.
36	PIC Wetland Enhancement	2017	Planted large open area at north end and interspersed through larger more mature plantings. 250 A. alnifolia, 300 L. involucrata, 300 P. capitatus, 200 R. sanguineum, 375 R. pisocarpa and 100 S. douglasii (February). Hand cut invasive species throughout the site (April).

Appendix C: Mitigation/Revegetation Site Maps (Figures 1 through 5)



Port of Portland geospatial data is gathered, maintained and primarily used for internal reference and analysis, and is only updated as resources permit. Geospatial data refers to data and information referenced to a location on the Earth's surface such as maps, charts, air photos, satellite images, cadastre and land and water surveys, in digital or hard copy form. Geospatial data may be gathered and maintained by more than one person or department within the Port, and data distributed by one person or department may not reflect the most recent data available from the Port or from other sources. Port geospatial data is not intended for survey or engineering purposes or to describe the authoritative or precise location of boundaries, fixed human works, or the shape and contour of the earth. The Port makes no warranty of any kind, expressed or implied, including any warranty of merchantability, fitness for a particular purpose, or any other matter with respect to its geospatial data. The Port is not responsible for possible errors, omissions, misuse, or misrepresentation of its geospatial data. Port geospatial data is not intended as a final determination of such features as existing or proposed infrastructure, conservation areas, or the boundaries of regulated areas such as wetlands, all of which are subject to surveying or delineation and may change over time. No representation is made concerning the legal status of any apparent route of access identified in geospatial data. The foregoing disclaimer applies to uses of Port geospatial data in any context, including online access at Port workstations, remote access, or use in downloaded digital or hard copy form.

N:\Projects\GIS_Program\Work\20230112_TMDL_Hamalainen\MXDs\Fig_1_2022_TMDL_Mit_Reveg.mxd

Columbia Slough
Port Property
Parks

PORT OF PORTLAND
Portland, Oregon

0 1 2 miles

N

Preparer: GIS Program Office
Contact: gis@portofportland.com
Date: January 2023
Geographic Data Standards:
Projected Coordinate System Name: NAD 1983 HARN State Plane, Oregon North
Map Projection Name: Lambert Conformal Conic
Units: International Feet

Figure 1
MITIGATION AND REVEGETATION SITES
Port Mitigation and Revegetation Areas

Prepared for Maureen Minister, Natural Resources

Mitigation And Revegetation Projects

1.Columbia Grain Revegetation Project, 2000: Maintenance did not occur at this site in 2022.

6. N Marine Dr Overpass Revegetation Project, 2000: Maintenance did not occur at this site in 2022.

12. Terminal 5, Powerline and West Wye Mitigation Sites, 1995-2001: T5: Planted 500 native shrubs (February). West Wye: Mowed (October).

14. Rivergate Enhancement - North and South Slough Mitigation Site, 2003: Maintenance did not occur at this site in 2022.

15. Rivergate Enhancement - Leadbetter Peninsula Mitigation Site, 2003: Planted bareroot/gallon plants in RCG Restoration Site: 500 F. latifolia, 350 P. capitatus, 250 R. pisocarpa, 600 S. douglasii, 600 S. albus (February). Used grass-specific herbicide in RCG Restoration Site to treat RCG; treated grasses in dry areas of wetland; treated grasses in C. aperta planting area on south side of wetland. Target primarily RCG (August).

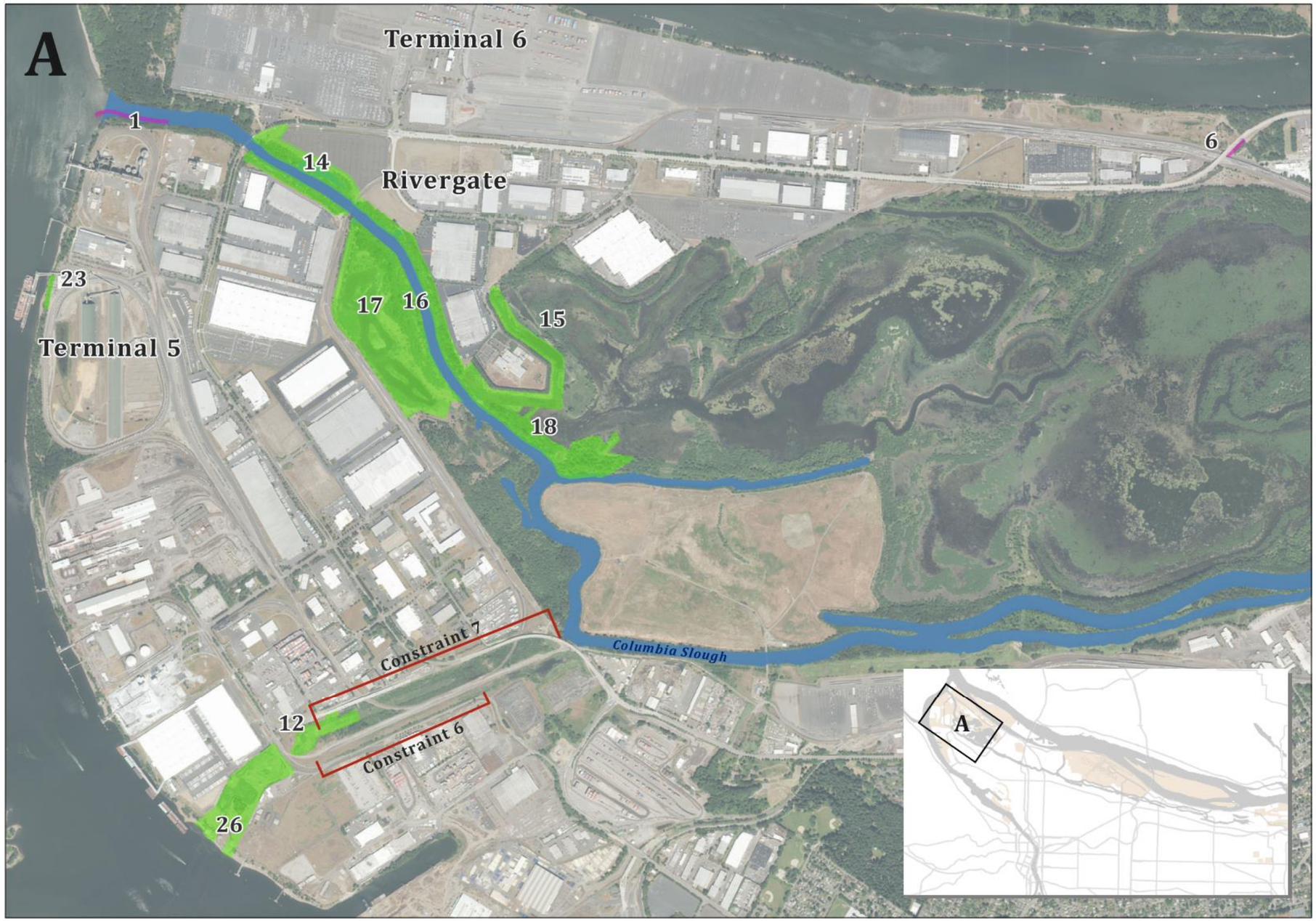
16 . Rivergate Enhancement - Ramsey, 2004: Planted bareroot/gallon plants in open areas of Enhancement Area and on the islands. 350 C. douglasii, 1050 F. latifolia, 200 L. involucrata, 300 P. capitatus, 200 R. parviflorus, 200 S. douglasii, 500 S. albus (February). Spot treated all islands for birds foot trefoil, teasel, poison hemlock, RCG, thistles (March). Treated invasive species on islands (August and September).

17. Ramsey Lake Mitigation Site, 1988: Planted bareroot/gallon plants in open areas of Enhancement Area and on the islands. 350 C. douglasii, 1050 F. latifolia, 200 L. involucrata, 300 P. capitatus, 200 R. parviflorus, 200 S. douglasii, 500 S. albus (February). Spot treated all islands for birds foot trefoil, teasel, poison hemlock, RCG, thistles (March). Treated invasive species on islands (August and September).

18. Rivergate Enhancement - 40-Mile Loop Trail Mitigation Site, 2004: Maintenance did not occur at this site in 2022.

23. Terminal 5, Berth 503 Bank Stabilization/ Revegetation Project, 1997-2001: Periodically maintained by Port Marine Maintenance.

26. Terminal 5, Greenway Planting Revegetation Project, 2002: Periodically maintained by Port Marine Maintenance.



Mitigation Sites

Revegetation Sites

PORT OF PORTLAND
Portland, Oregon

0 0.25 0.5 mile

Preparer: GIS Program Office
Contact: gis@portofportland.com
Date: January 2023
Geographic Data Standards:
Projected Coordinate System Name: NAD 1983 HARN State Plane, Oregon North
Map Projection Name: Lambert Conformal Conic
Units: International Feet

Figure 2
MITIGATION & REVEGETATION SITES
Terminal 5, Terminal 6, and Rivergate

Prepared for Maureen Minister, Natural Resources

N:\Projects\GIS_Program\Work\20230112_TMDL_Hamalainen\MXDs\Fig_2_2022_TMDL_Mit_Reveg_T6_T5_RG.mxd

Mitigation And Revegetation Projects

20. Terminal 4, Berth 408, 2001-02: Periodically maintained by Port Marine Maintenance.

21. Terminal 4, Pier 2, Rail Yard Improvements (Willamette Greenway), 2007: Periodically maintained by Port Marine Maintenance.

22. Terminal 4, Toyota Riverbank Restoration Project, 2003: Periodically maintained by Port Marine Maintenance.

24. Terminal 4, Berth 401 Riverbank Rehabilitation Project, 2000: Periodically maintained by Port Marine Maintenance.

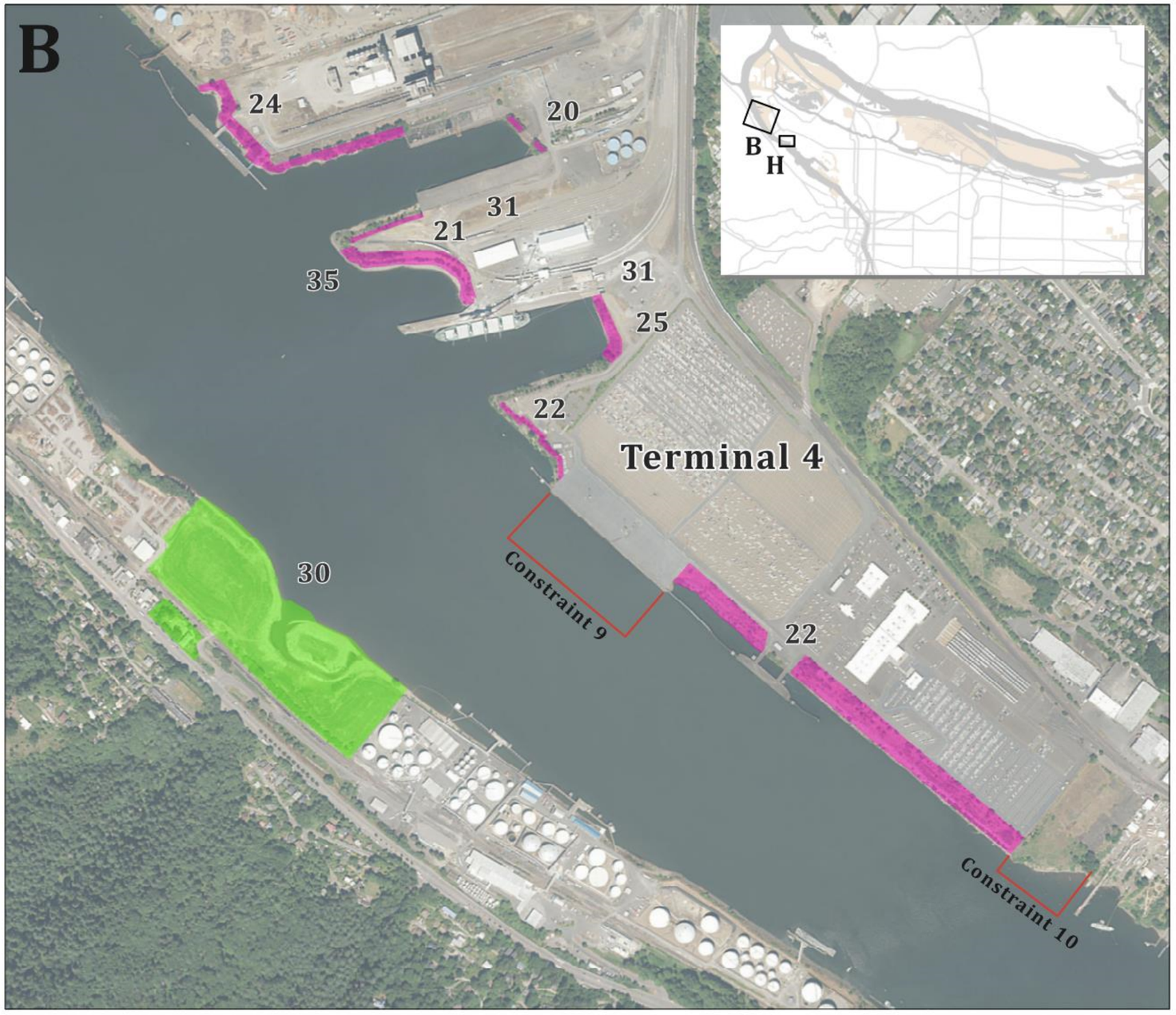
25. Terminal 4, Slip 3 Remediation and Revegetation Project, 2004: Periodically maintained by Port Marine Maintenance.

30. Linnton Mitigation Bank, 2019: Construction at this site was completed in 2019. This site is part of the suite of restoration sites under the Portland Harbor Superfund Natural Resource Damage Assessment. Port purchased credits at this site in 2019.

31. T4 Infiltration, 2020: Stormwater Treatment Facilites constructed for Basin M and Basin K1. Both facilities reduce pollutant loading to the river by infiltrating 90% of the runoff. Annual inspection and maintenance will be ongoing.

32. Willamette Cove, 2023: DEQ Record of Decision issued in March 2021 for final cleanup. Site is in the remedial design phase. Restoration will commence after cleanup.

35. Wheeler Bay Bank Stabilization Project, 2008: Periodically maintained by Port Marine Maintenance.



Mitigation Sites

Revegetation Sites

PORT OF PORTLAND
Portland, Oregon

Feet
0 500 1,000

N

Preparer: GIS Program Office
Contact: gis@portofportland.com
Date: January 2023
Geographic Data Standards:
Projected Coordinate System Name: NAD 1983 HARN State Plane, Oregon North
Map Projection Name: Lambert Conformal Conic
Units: International Feet

Figure 3
MITIGATION & REVEGETATION SITES
Terminal 4

Prepared for Maureen Minister, Natural Resources

N:\Projects\GIS_Program\Work\20230112_TMDL_Hamalainen\MXDs\Fig_3_2022_TMDL_Mit_Reveg_T4.mxd

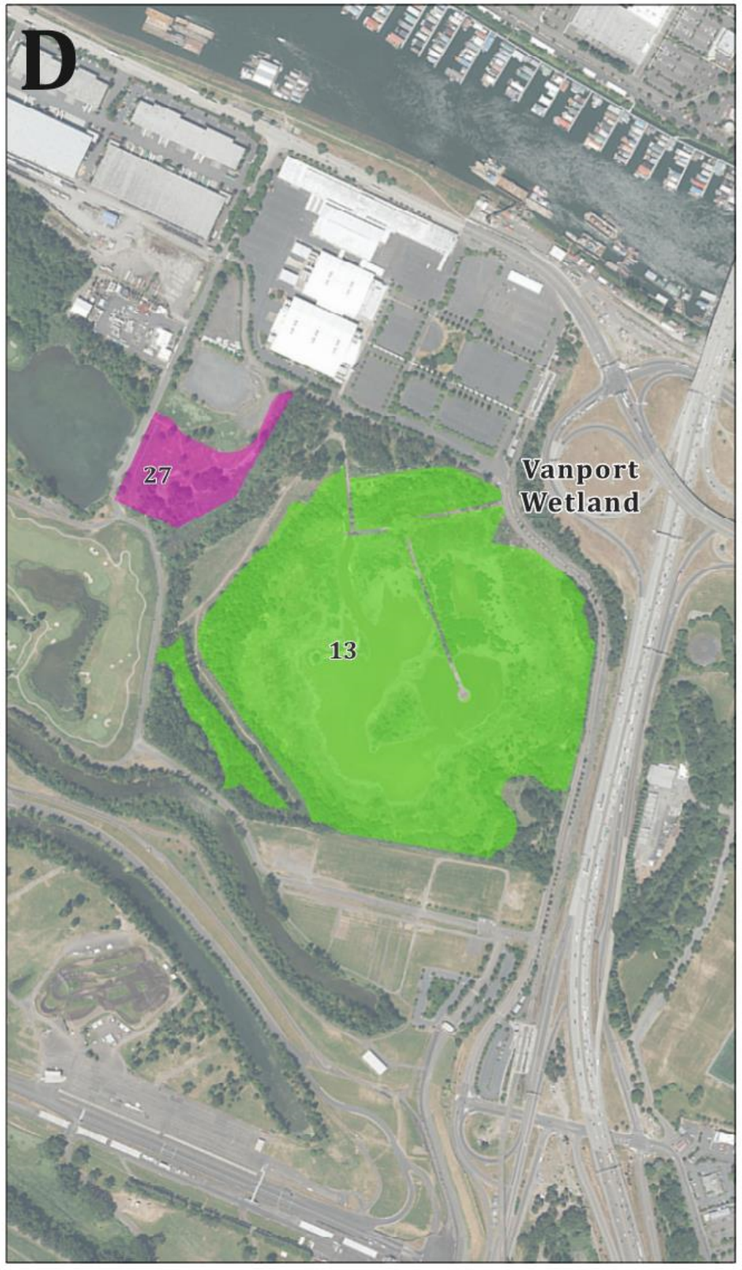
Mitigation And Revegetation Projects

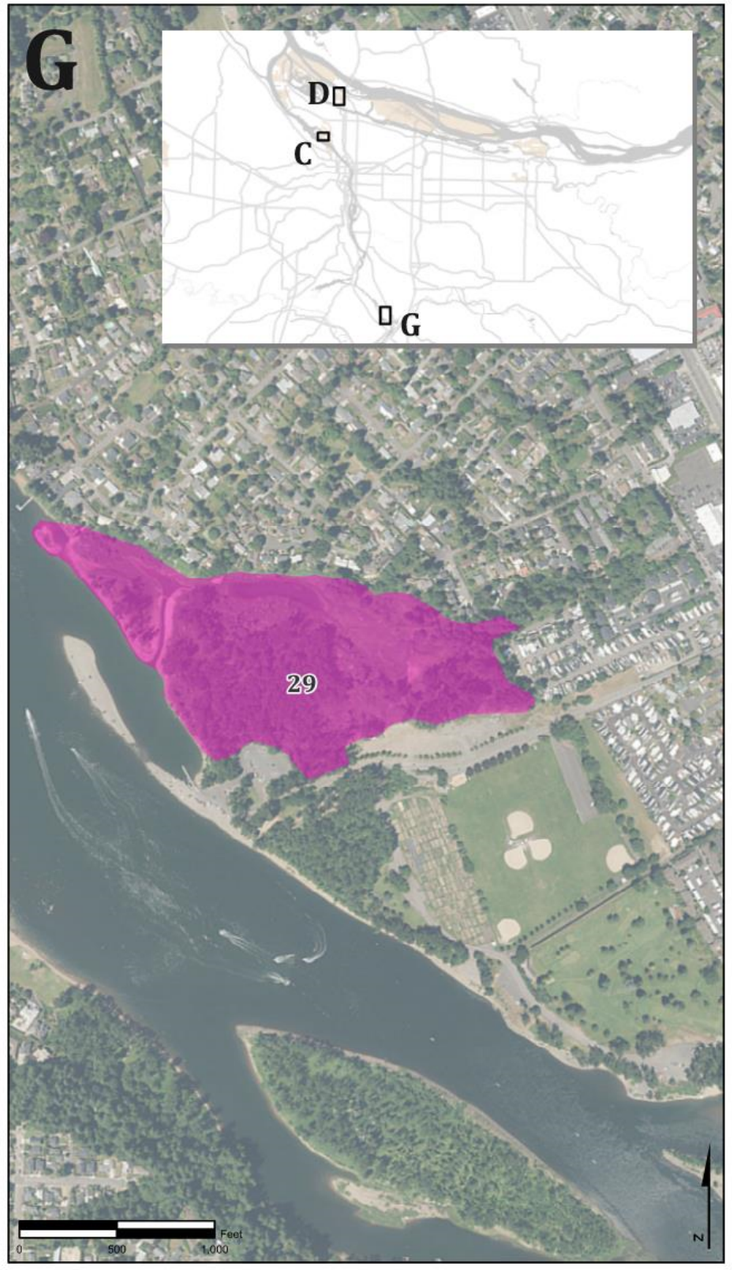
13. Vanport Wetland Mitigation Site, 2000-06: Planted native shrubs on the west side of wetland; 200 C douglasii, 250 F. latifolia, 700 L. involucrata, 200 M. aquifolium, 250 P. capitatus, 300 R. sanguineum, 100 R. pisocarpa, 300 R. parviflorus, 700 R. spectabilis, 200 S. cerulea, 200 S. racemosa, 600 S. douglasii, 600 S. albus (February). Planted 7 ball and bulap size oaks (1.25'-1.5' caliper) in open field area of west side; spot treated east of pumphouse targeting teasel, thistle, poison hemlock and mullein (April). Cut access paths through grass to safely access oak trees for watering; cut grasses in planting area to prep for circle spray treatments. Treated nightshade and pennyroyal in wetland. Watered oak trees. Handcut invasive grasses SW of pumphouse; handcut grasses south of N. Ditch; target species include tall oatgrass, velvetgrass, reed canarygrass. Treated nightshade and pennyroyal in wetland, east side. Treated blackberry along access road adjacent to SW Swale. Cleared blackberries from fence in advance of fence repair by McDermott (August). Treated invasive species throughout the site (September). Spot treated west buffer for blackberry, reed canarygrass, tansy, teasel, thistle and velvet grass (October).

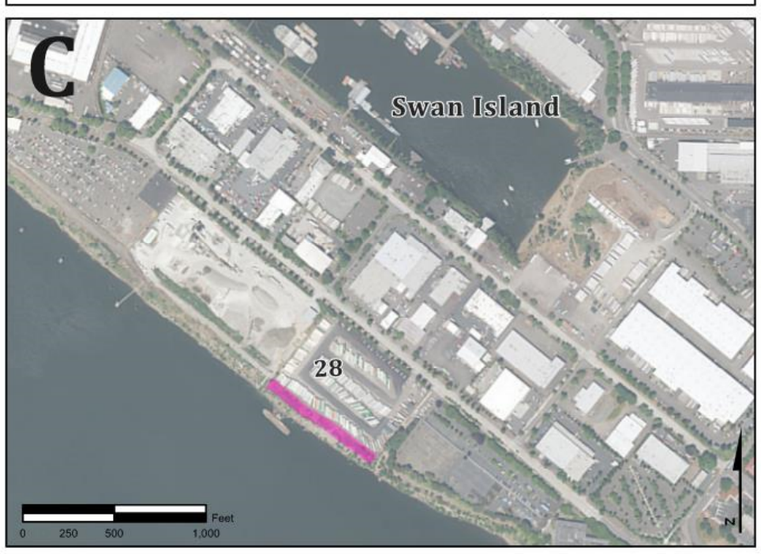
27. Force Avenue: 2009 Site is mowed each summer.

28. Swan Island Enhancement Project, 2017: Construction at this site was completed in 2017. This enhancement project was mitigation for the Swan Island Operable Unit 2 Upland Source Control work.

29. Rinearson Creek/ Meldrum Bar Park Restoration Project, 2018: Construction at this site was completed in 2018. This site is part of the suite of restoration sites under the Portland Harbor Superfund Natural Resource Damage Assessment. Port purchased credits at this site in 2019.







Mitigation Sites

Revegetation Sites

PORT OF PORTLAND
Portland, Oregon

0 500 1,000 Feet

N

Preparer: GIS Program Office
Contact: gis@portofportland.com
Date: January 2023
Geographic Data Standards:
Projected Coordinate System Name: NAD 1983 HARN State Plane, Oregon North
Map Projection Name: Lambert Conformal Conic
Units: International Feet

Figure 4
MITIGATION & REVEGETATION SITES
Swan Island, Vanport Wetland, and Confluence of Willamette & Clackamas Rivers
Prepared for Maureen Minister, Natural Resources

N:\Projects\GIS_Program\Work\20230112_TMDL_Hamalainen\MXDs\Fig_4_2022_TMDL_Mit_Reveg_SI_VW.mxd

Mitigation And Revegetation Projects

2. 82nd to 92nd Ave Revegetation Project, 2000: Maintenance did not occur at this site in 2022.

3. 92nd Ave to I-205 Revegetation Project 2000-01: Installed beaver protection fencing aound priority trees. Caged all trees 6" dbh and above, or if it looked like the tree presented danger to the overhead lines or adjacent fences (January). Installed 500 native bareood/container plants in open areas (February).

4. Cornfoot Rd Project, 2000: Maintenance did not occur at this site in 2022.

5. PDX Port Maintenance Bldg Revegetation Project (Meyers Marx), 2000: Maintenance did not occur at this site in 2022.

7. Alderwood Slough Revegetation Project, 2000: Maintenance did not occur at this site in 2022.

8. Alderwood Corner Revegetation Project, 2000: Maintenance did not occur at this site in 2022.

9. Buffalo Street Mitigation Site, 1994, 2003: Planted 800 native shrubs along the Columbia Slough (February). Treated blackberry in areas where plants were installed (August).

10. PDX Economy Lot E-zone Conversion Project, Ongoing: Maintenance did not occur at this site in 2022.

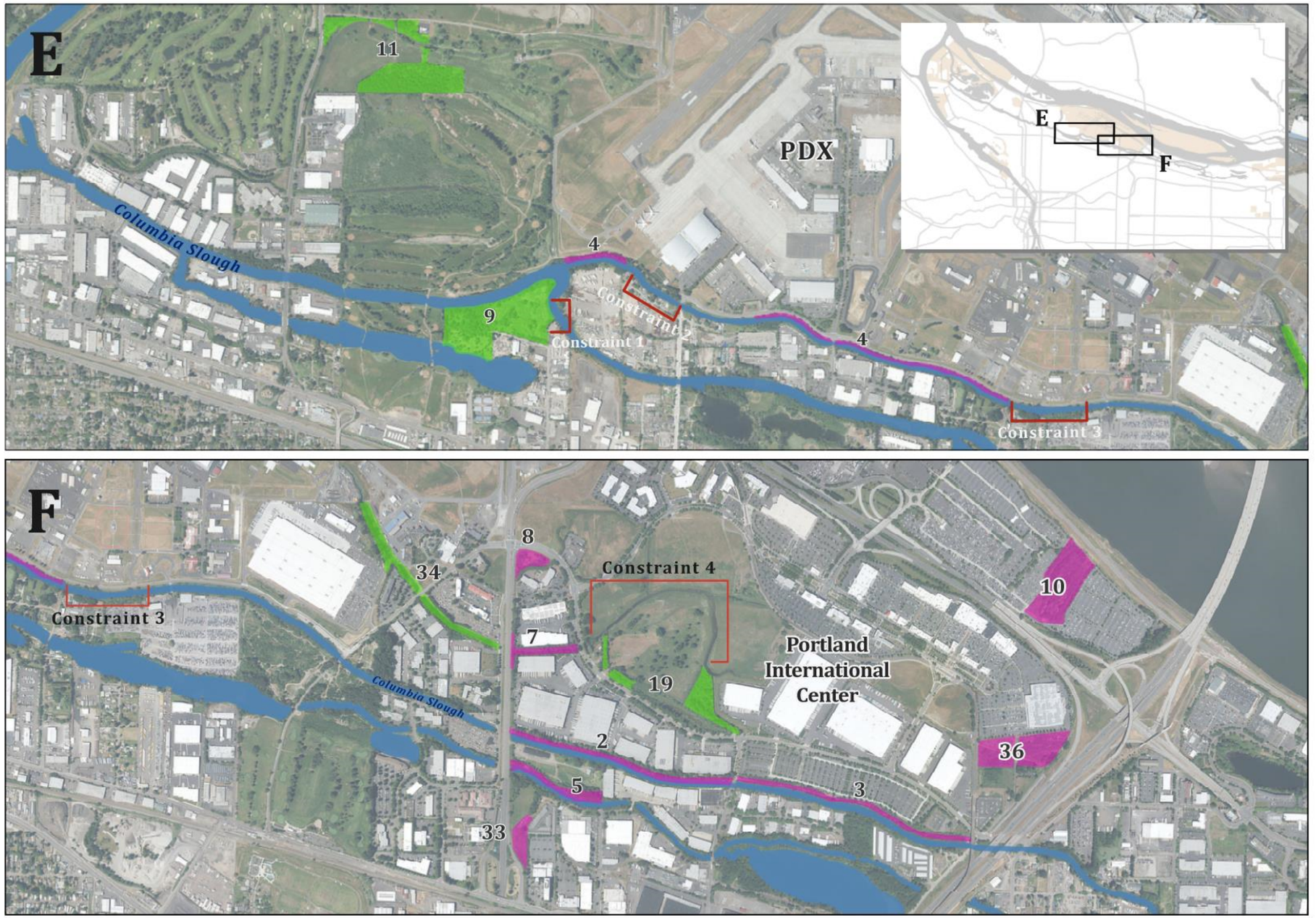
11. Elrod Rd Mitigation Site, 1994: Treated large blackberry patches; sprayed ivy and holly (January). Interplanted a portion of the "back-40" area with 1125 native shrubs (March). Treated back-40 area for blackberry and thistles (August).

19. PIC E-zone Mitigation Site, 2000-02: Maintenance did not occur at this site in 2022.

33. 82nd Ave. Oak Woodland Planting, 2019: No maintenance occured in 2022.

34. McBride Slough, 2019: Planted 200 Acer circinatum, 200 Fraxinus latifolia, 100 Ribes sanguineum, 800 Spiraea douglasii (February). Spot sprayed invasive species throughout the site (June).

36. PIC Wetland Enhancement, 2017: Planted large open area at north end and interspersed through larger more mature plantings. 250 A. alnifolia, 300 L. involucrata, 300 P. capitatus, 200 R. sanguineum, 375 R. pisocarpa and 100 S. douglasii (February). Hand cut invasive species throughout the site (April).



N:\Projects\GIS_Program\Work\20230112_TMDL_Hamalainen\MXDs\Fig_5_2022_TMDL_Mit_Reveg_PDX_PIC.mxd

Mitigation Sites

Revegetation Sites

PORT OF PORTLAND
Portland, Oregon

0 0.25 0.5 mile N

Preparer: GIS Program Office
Contact: gis@portofportland.com
Date: January 2023
Geographic Data Standards:
Projected Coordinate System Name: NAD 1983 HARN State Plane, Oregon North
Map Projection Name: Lambert Conformal Conic
Units: International Feet

Figure 5
MITIGATION & REVEGETATION SITES
PDX and Portland International Center

Prepared for Maureen Minister, Natural Resources

Appendix D: Airport Futures Natural Resource Enhancement Projects (Figures 6 and 7)

Canopy Enhancement Projects

1. Parkrose Sumner Transit Station Tree Planting
2012: Planted native trees and added stormwater infiltration features.

2. Elrod Slough Tree Planting
2013: Planted 70 native trees.

3. Columbia Children's Arboretum Tree Planting
2014-2015: Planted 570 native trees and shrubs and removed invasive species.
2016: Planted 300 native trees and shrubs and invasive species removal. This project helped revegetate the site increasing infiltration to enhance summer base flows in the lower reach of the Columbia Slough.
2017: Planted 330 native trees and shrubs.
2018: Planted 400 native trees and shrubs.
2019: Planted 1,300 native trees and shrubs.
2020: Planted 982 native trees.

4. Argay, Parkrose, Russell, Sumner, Wilkes Tree Planting
2015: Planted 132 native trees for canopy enhancement.
2018: Planted 110 native trees.
2019: Planted 84 native trees.
2020: Planted 100 trees.

5. Concordia, Vernon Tree Planting
2015: Planted 142 native trees.
2016: Planted 125 native street and yard trees in Concordia and Vernon neighborhoods.
2017: Planted 125 street and yard trees.
2020: Planted 150 trees.

6. Beaumont-Wilshire, Cully, Roseway Tree Planting
2015: Planted 180 native trees for canopy enhancement.
2018: Planted 215 trees.
2019: Planted 200 trees.

7. I-205 Tree Planting, 2015:
2015: Planted 45 native trees for canopy enhancement.

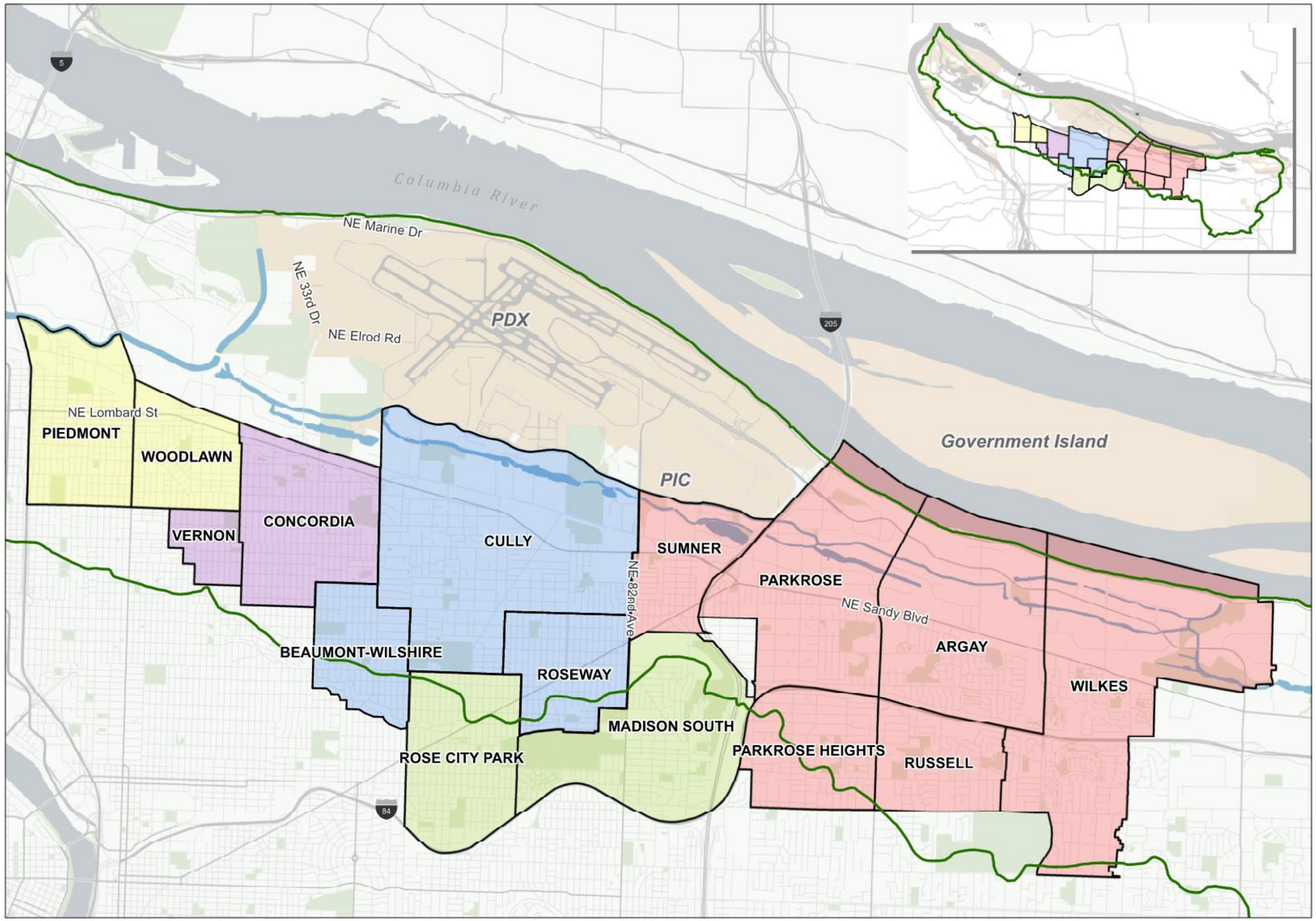
8. I-205 Piedmont, Woodlawn tree Planting
2016: Planted 234 native trees for canopy enhancement over the course of two projects.
2017: Planted 142 street and yard trees.

9. Madison South, Rose City Park, Sumner
2016: Planted 110 native trees for canopy enhancement.

10. Columbia Slough Natural Area
2016: Planted native trees and shrubs.
2020: Planted 746 trees.

11. Gateway Green Park
2020: Planted 167 trees.

12. Greening Wilkes
2022: Planted 1025 native trees and shrubs.



Columbia Slough | Watershed Boundary | Project Area | Port Property | Parks

PORT OF PORTLAND
Portland, Oregon

0 0.5 1 mile

N

Preparer: GIS Program Office
Contact: gis@portofportland.com
Date: January 2023
Geographic Data Standards:
Projected Coordinate System Name: NAD 1983 HARN State Plane, Oregon North
Map Projection Name: Lambert Conformal Conic
Units: International Feet

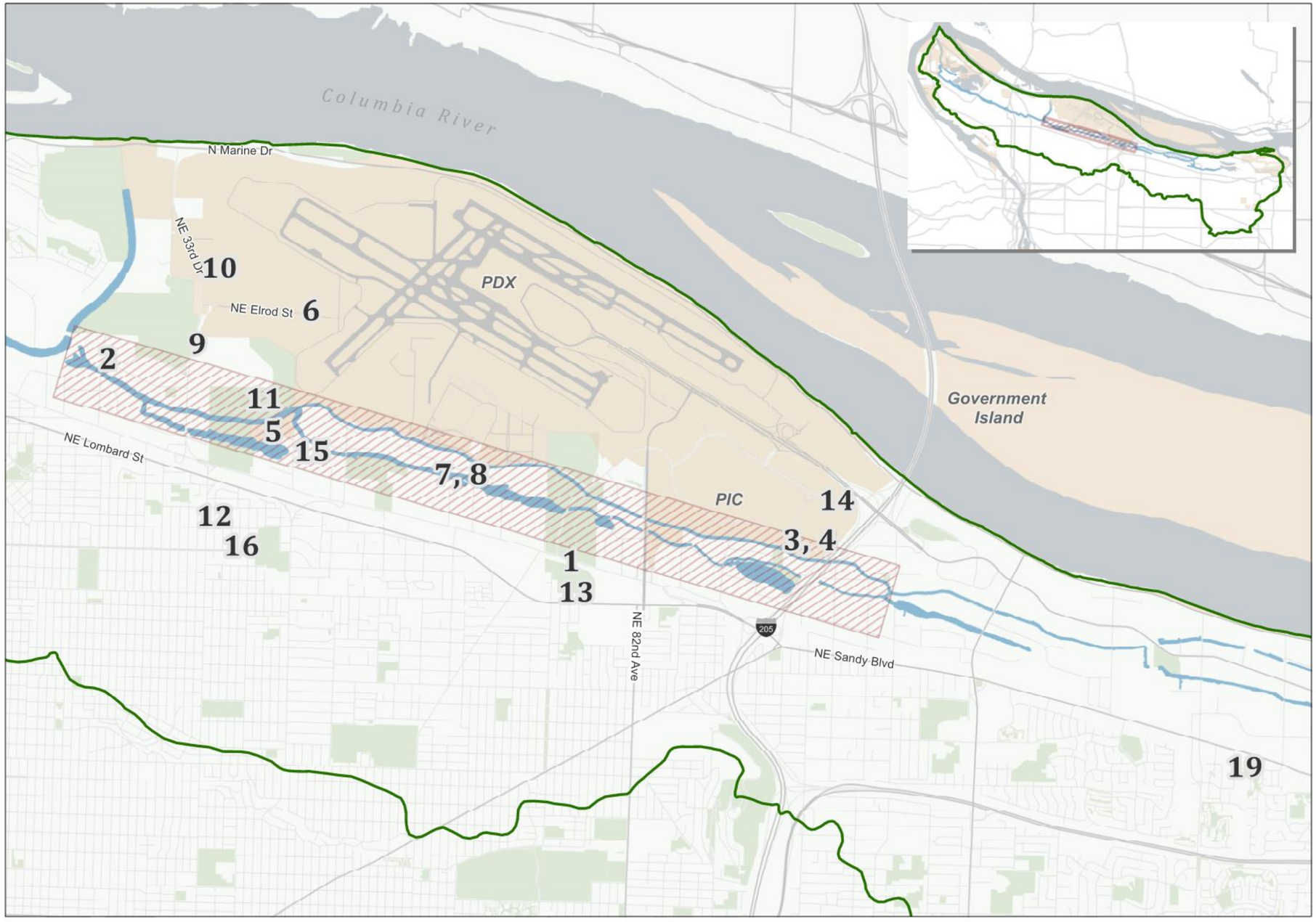
Figure 6
AIRPORT FUTURES
Canopy Enhancement Projects

Prepared for Maureen Minister, Natural Resources

N:\Projects\GIS_Program\Work\20230112_TMDL_Hamalainen\MXDs\Fig_6_2022_TMDL_Canopy_Projects.mxd

Columbia Slough Enhancement Projects

1. Cully Park North Slope Restoration, 2012
2. Elrod Slough Restoration, 2013
3. Portland International Center (PIC), Wetland Conversion Project - Phase I, 2013
4. Portland International Center (PIC), Wetland Conversion Project - Phase II, 2014
5. Buffalo Slough Turtle Habitat Enhancement, 2016
6. Elrod Slough Culvert Replacement, 2015
7. Main Channel Benches, 2016
8. Better Beaver Behavior, 2016
9. Vegetation Management, 2016
10. NE 33rd Riparian Corridor, 2018 and 2019
11. Island Canopy Establishment, 2018 and 2019
12. Audubon Backyard Habitat Certification Program (BHCP), 2018
13. North Slope Habitat Restoration, 2018
14. ACME Riparian Restoration, 2019
15. CSWC Engineered Wetland Whitaker Ponds, 2020
16. Verde Cully Community Rain Garden Project, 2020
17. CSWC Stewardship Enhancements, 2021 and 2022 (various locations, not shown on map)
18. Audubon BHCP, 2021 (various locations, not shown on map)
19. Greening Wilkes Project, 2022



Port of Portland geospatial data is gathered, maintained and primarily used for internal reference and analysis, and is only updated as resources permit. Geospatial data refers to data and information referenced to a location on the Earth's surface such as maps, charts, air photos, satellite images, cadastre and land and water surveys, in digital or hard copy form. Geospatial data may be gathered and maintained by more than one person or department within the Port, and data distributed by one person or department may not reflect the most recent data available from the Port or from other sources. Port geospatial data is not intended for survey or engineering purposes or to describe the authoritative or precise location of boundaries, fixed human works, or the shape and contour of the earth. The Port makes no warranty of any kind, expressed or implied, including any warranty of merchantability, fitness for a particular purpose, or any other matter with respect to its geospatial data. The Port is not responsible for possible errors, omissions, misuse, or misrepresentation of its geospatial data. Port geospatial data is not intended as a final determination of such features as existing or proposed infrastructure, conservation areas, or the boundaries of regulated areas such as wetlands, all of which are subject to surveying or delineation and may change over time. No representation is made concerning the legal status of any apparent route of access identified in geospatial data. The foregoing disclaimer applies to uses of Port geospatial data in any context, including online access at Port workstations, remote access, or use in downloaded digital or hard copy form.

Columbia Slough | Watershed Boundary | 7 & 8 Project Area | Port Property | Parks

PORT OF PORTLAND
Portland, Oregon

0 0.5 1 mile

N

Preparer: GIS Program Office
Contact: gis@portofportland.com
Date: January 2023
Geographic Data Standards:
Projected Coordinate System Name: NAD 1983 HARN State Plane, Oregon North
Map Projection Name: Lambert Conformal Conic
Units: International Feet

Figure 7
AIRPORT FUTURES
Columbia Slough Enhancement Projects

Prepared for Maureen Minister, Natural Resources

N:\Projects\GIS_Program\Work\20230112_TMDL_Hamalainen\MXDs\Fig_7_2022_TMDL_CS_Enhance_Projects.mxd