

APPENDICES

A TMDL Implementation Plan Annual Report

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Appendix A

TMDL Implementation Plan Annual

Report

November 1, 2024

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City of Portland, Oregon

Total Maximum Daily Load (TMDL) Implementation Plan

ANNUAL STATUS REPORT NO. 15

Fiscal Year 2023-2024

(July 1, 2023, to June 30, 2024)

Prepared for:

Oregon Department of Environmental Quality

Submitted by:

City of Portland

Submitted on: November 1, 2024

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Acronym List

BES	Bureau of Environmental Services
City	City of Portland
DEQ	Department of Environmental Quality
DMA	Designated Management Agency
FY	fiscal year
MS4	municipal separate storm sewer system
NPDES	National Pollutant Discharge Elimination System
SWMM	stormwater management manual
SWMP	stormwater management program
TIP	TMDL Implementation Plan
TMDL	Total Maximum Daily Load

Section 1

Introduction

This Total Maximum Daily Load (TMDL) annual status report (annual report) summarizes key activities and accomplishments in accordance with the City of Portland's 2023 *TMDL Implementation Plan* (TIP). This TMDL annual report summarizes the implementation status of the City of Portland's (City's) activities and management strategies to reduce TMDL pollutants in local water bodies during fiscal year (FY) 2023–24 (July 1, 2023, through June 30, 2024).

The City employs many environmental programs and activities to address both point and nonpoint sources of pollutants.¹ Consequently, many activities implemented by the City to meet TMDL requirements are also conducted to fulfill obligations under the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit No. 101314 (MS4 Permit). A separate annual report is submitted to the Oregon Department of Environmental Quality (DEQ) for compliance with the City's MS4 Permit and associated *Stormwater Management Program* (SWMP) document. This TMDL annual report is included as an appendix to the City's MS4 annual report and refers to that report for stormwater-related topics and implementation of select management strategies identified in the TIP. Temperature-related strategies to specifically address thermal load allocations are detailed in this annual report.

1.1 Background and Applicability

The City is a listed Designated Management Agency (DMA) in Portland-area TMDLs, developed by the DEQ and approved by the U.S. Environmental Protection Agency. DMAs are required to develop a TIP, report on implementation progress annually, provide a summary of overall progress every 5 years, and update the TIP as necessary.

The City's 2023 TIP identifies management strategies the City uses to reduce pollutants from nonpoint sources to restore and protect water quality in local waterways and the Willamette River. It reflects an update of the City's previous TIP (September 2022) following the completion of DEQ's 5-year lookback survey, which reported on TIP implementation progress over the last 5 years. The survey provided an opportunity to identify improvements to the City's management strategies.

Following the 5-year plan cycle, the City submitted its latest TIP to DEQ for review and approval in November 2023. The new TIP includes updated management strategies, performance metrics, and timelines based on the findings from the 5-year "lookback" survey. At the time of this report, the City is awaiting approval of the 2023 TIP from DEQ. For FY 2023–24, DEQ directed the City to report on implementation of the 2023 TIP.

¹ TMDLs divide a total allowable pollutant load into allocations to point sources (called "waste load allocations") and nonpoint sources (called "load allocations") and several other input factors. Waste load allocations established in TMDLs are implemented through NPDES permits.

1.2 Report Organization

This annual TMDL report covers implementation actions and accomplishments that occurred during FY 2023–24. The report is organized into the following sections:

- Section 2: Adaptive Management and Reporting
- Section 3: Management Strategies
- Section 4: Temperature-Related Activities

Section 2

Adaptive Management and Reporting

The City uses an adaptive management approach to identify whether the TIP needs to be modified for improved effectiveness. This includes both an annual process and a more comprehensive longer-term process. Public involvement and reporting activities are conducted throughout the plan implementation period.

2.1 Adaptive Management

The City conducts the annual adaptive management process in conjunction with its annual MS4 report and TMDL report preparation. This annual review process is used to determine if the City's TMDL programs are being implemented in accordance with the TIP and to identify whether any adjustments are needed.

In addition, every 5 years, DEQ requires DMAs to evaluate the implementation of management strategies contained in their TIPs. The resulting 5-year lookback report indicates whether the TIP is adequately meeting pollution reduction goals. As part of this process, the City reviews the TIP to assess its strategies and progress toward meeting goals and to propose changes as appropriate. Existing strategies are reviewed and refined to reflect progress made over the last 5 years, and the TIP is updated accordingly, if needed. The City completed the most recent assessment of sufficiency in 2023, evaluating the performance of management strategies in meeting TMDL load allocations. The results of the assessment indicate that the City's strategies are making steady progress toward meeting load allocations within Portland. The City successfully achieved all but one of the temperature goals in the City's previous TIP. Given the findings from the most recent evaluation, the City's 2023 TIP continues to employ many of the same management strategies, along with updated goals and timelines.

2.2 Public Involvement and Reporting

Annual reports are prepared and submitted to DEQ each year by November 1, outlining activities and accomplishments that are associated with identified strategies, performance monitoring metrics, and implementation timelines reflected in the TIP. The report summarizes implementation of strategies and identifies programmatic issues or modifications needed.

The City's current TIP, past TIPs, annual TMDL reports, 5-year evaluations, and other relevant information are posted online and made publicly available.² A contact number is provided for those who have questions or want to provide input on the City's plans, strategies, and other environmental program activities.

² TMDL and MS4 materials are available on the City's website at:
<https://www.portland.gov/bes/stormwater/ms4>.

Section 3 Management Strategies

The City's TIP proposes a range of management strategies to reduce TMDL pollutants from sources in the Columbia Slough, Tualatin Subbasin, and Willamette Basin. These strategies are designed to restore and protect water quality in local waterways and the Willamette River.

The City implements these management strategies through different mechanisms. As noted previously, DEQ implements TMDL requirements for point sources through NPDES permit conditions, including the City's MS4 Permit. The City's SWMP document describes in detail the stormwater management strategies the City employs to meet MS4 Permit conditions.³ The stormwater strategies are designed to prevent and control pollution from stormwater discharges, including TMDL pollutants. Although the SWMP addresses discharges from the City's MS4, most of the SWMP strategies are applied citywide and reduce TMDL pollution from nonpoint sources as well.

The City reports on stormwater management strategies described in the SWMP document in the City's annual MS4 report. More information about the stormwater management strategies can be found in the City's current SWMP document, and details about the stormwater management activities conducted during the 2023–24 reporting period are included in the City's 2023–24 annual MS4 compliance report.

The management strategies described in detail in the TIP focus on those that address temperature. Temperature is not considered a stormwater pollutant and is not covered by the City's SWMP. Strategies that specifically address temperature and coldwater refugia are discussed in more detail in Section 4.

³ The City's MS4 Permit and current Stormwater Management Program document are available online: <https://www.portland.gov/bes/stormwater/ms4>.

Section 4

Temperature-Related Activities

The City conducts multiple activities to address elevated stream temperatures in local streams and rivers. Restoration and the protection of riparian vegetation are the primary methods for increasing stream shading and addressing nonpoint source load allocations to achieve system potential shade conditions.⁴ The City uses a combination of strategies to address temperature, including planning, resource protection, land acquisition, active restoration and planting, monitoring, and public outreach.

As noted in Section 3, many of the City's key management strategies to reduce TMDL pollutants and improve water quality are conducted to address requirements of the City's NPDES MS4 Permit and associated SWMP. Specific goals and targets related to water temperature and the City's efforts toward meeting nonpoint source temperature load allocations are identified in and are the focus of the TIP and the TMDL annual report.

Temperature-related goals and targets are summarized below in Table 4.1. Each goal includes a timeline, performance metric(s), interim milestone(s), and a description of implementation activities conducted during FY 2023–24 to meet the identified interim milestones or performance metrics. Specific projects to meet TIP Goal #11 (TIP-11) related to hydrologic connectivity and watershed restoration are referenced in Table 4.2.

The City maintains an inventory of completed restoration projects and hosts a publicly available interactive web map.⁵ The inventory and associated web map include details on the projects that have been completed to date, showing project goals, metrics (e.g., number of trees planted), and locations. Projects listed in Table 4.2 that have been completed can be viewed in the web map.

4 System potential vegetation for the Willamette River subbasins, as defined in Appendix C, Chapter 2– Potential Near-Stream Land Cover in the Willamette Basin for TMDLs, is the potential near-stream land cover condition. Potential near-stream land cover can grow and reproduce on a site given climate, elevation, soil properties, plant biology, and hydrologic processes. System potential does not consider management or land use as limiting factors. In essence, system potential is the design condition used for TMDL analysis that meets the temperature standard by minimizing human-related warming.

System potential is an estimate of the condition where anthropogenic activities that cause stream warming are minimized.

System potential is not an estimate of presettlement conditions. Although it is helpful to consider historic land cover patterns, channel conditions, and hydrology, many areas have been altered to the point that the historic condition is no longer attainable given drastic changes in stream location and hydrology (channel armoring, wetland draining, urbanization, etc.).

5 The web map can be accessed online at:

<https://pdx.maps.arcgis.com/apps/webappviewer/index.html?id=807ed51bb0314f9cbd31815c73ff9b6e>.

Presented in Table 4.1 are several activities that were not included in the City's 2023 TIP. While not included as annual commitments in the TIP, these activities are funded by the City and implemented by partner organizations. These activities include the planting of native trees and shrubs and invasive species treatment and management by community groups and non-profit organizations in Portland. These activities help the City achieve nonpoint source load allocations.

Table 4.1: Goals and Targets for Temperature TMDL Strategies

Goal ID	Category	Target/Description	Timeline (Goal)	Performance Metrics	Interim Milestones and Timelines	Reporting Activities																								
TIP-01	Effective Shade Assessment	Conduct a geospatial assessment of riparian conditions within Portland and progress toward meeting the TMDL nonpoint source load allocations.	Complete by end of TIP cycle	Completed assessment	<ol style="list-style-type: none"> FY 2023–24: Review previous effective shade assessment. FY 2024–25: LiDAR acquisition. FY 2025–26: Process LiDAR and GIS datasets. FY 2026–27: Complete modeling and compile effective shade results. FY 2027–28: Report effective shade results. 	<ol style="list-style-type: none"> Completed FY 2023–24: Reviewed previous effective shade assessment and secured an agreement to collect LiDAR data in summer 2024. 																								
TIP-02	Floodplain, Riparian, and Wetland Protection	Complete the Columbia Corridor and Industrial Lands Environmental Overlay Zone Project.	Anticipate public hearings in 2024 and adoption by the end of the TIP cycle	Updated Overlay Zone Map	<ol style="list-style-type: none"> FY 2023–24: Publish preliminary draft environmental overlay zones. FY 2024–25: Hold public hearings on the draft environmental overlay zones. FY 2027–28: Complete the Columbia Corridor and Industrial Lands Environmental Overlay Zone Project. 	<ol style="list-style-type: none"> Completed FY 2023–24: Published preliminary draft environmental overlay zones based on the Natural Resource Inventory. 																								
TIP-03	Floodplain, Riparian, and Wetland Protection	Complete the Floodplain Resiliency Plan.	Anticipate public hearings in 2023 and adoption in 2024	Adopted Plan and updated City Code	<ol style="list-style-type: none"> FY 2023–24: Release draft plan and accept public testimony. FY 2024–25: Adopt Plan and update City Code. 	<ol style="list-style-type: none"> Completed FY 2023–24: Published draft Plan and accepted public testimony. 																								
TIP-04	Onsite Stormwater Retention and LID	Revise and update the <i>Stormwater Management Manual</i> (SWMM).	Within the next MS4 Permit term	Updated SWMM	Outline schedule in accordance with provisions of the SWMP document and renewed Phase I NPDES MS4 Permit.	Completed FY 2023–24: Draft SWMM and internal review completed.																								
TIP-05	Invasive Species Management and Treatment	Perform management, assessment, and treatment of invasive species on 5,000 acres.	By the end of the TIP cycle	Acres managed, assessed, and treated	Perform management, assessment, and treatment of invasive species on 1,000 acres each year on average.	<table border="1"> <thead> <tr> <th>Acres</th> <th>2023–24</th> <th>2024–25</th> <th>2025–26</th> <th>2026–27</th> <th>2027–28</th> </tr> </thead> <tbody> <tr> <td>Annual</td> <td>1,891</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Cumulative</td> <td>1,891</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% of Goal</td> <td>37.8%</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Acres	2023–24	2024–25	2025–26	2026–27	2027–28	Annual	1,891					Cumulative	1,891					% of Goal	37.8%				
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TIP-06	Invasive Species Management and Treatment	Survey the Lower Columbia Slough for invasive aquatic macrophytes and treat where identified. Total extent is 9.4 miles on center or 18.8 miles along left and right banks.	80% or more of total extent by end of TIP cycle	Linear miles surveyed	Survey the Lower Columbia Slough for invasive aquatic macrophytes and treat where identified. Work to cover 80% or more of the total extent: at least 7.5 miles on center or 15 miles at banks.	<table border="1"> <thead> <tr> <th>Miles</th> <th>2023–24</th> <th>2024–25</th> <th>2025–26</th> <th>2026–27</th> <th>2027–28</th> </tr> </thead> <tbody> <tr> <td>On Center</td> <td>7.2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>At Banks</td> <td>14.4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% of Goal</td> <td>96%</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Miles	2023–24	2024–25	2025–26	2026–27	2027–28	On Center	7.2					At Banks	14.4					% of Goal	96%				
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TIP-07	Riparian Revegetation	Plant 100,000 native trees and shrubs in identified natural and riparian areas.	By the end of the TIP cycle	Plantings (#)	Plant 20,000 native trees and shrubs in identified natural and riparian areas each year on average.	<table border="1"> <thead> <tr> <th>Plantings</th> <th>2023–24</th> <th>2024–25</th> <th>2025–26</th> <th>2026–27</th> <th>2027–28</th> </tr> </thead> <tbody> <tr> <td>Annual</td> <td>59,507</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Cumulative</td> <td>59,507</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% of Goal</td> <td>59.5%</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Plantings	2023–24	2024–25	2025–26	2026–27	2027–28	Annual	59,507					Cumulative	59,507					% of Goal	59.5%				
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TIP-08	Land Acquisition	Evaluate the potential for land acquisition for strategic restoration and protection of watershed hydrology. ¹	By the end of the TIP cycle	Acres acquired (#) ²	Due to the uncertainty associated with feasibility, interim milestones and timelines are not feasible. The City will report on all land acquisition activities annually.	<table border="1"> <thead> <tr> <th>Acres²</th> <th>2023–24</th> <th>2024–25</th> <th>2025–26</th> <th>2026–27</th> <th>2027–28</th> </tr> </thead> <tbody> <tr> <td>Annual</td> <td>29.2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Cumulative</td> <td>29.2</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Acres ²	2023–24	2024–25	2025–26	2026–27	2027–28	Annual	29.2					Cumulative	29.2										
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Cumulative	29.2																													
TIP-09	Upland Tree Planting	Plant 7,500 upland trees during the Plan term through partnerships with nonprofits, community members, businesses, and schools.	By the end of the TIP cycle	Trees planted (#)	Plant an average of 1,500 upland trees each year during the plan term through partnerships with nonprofits, community members, businesses, and schools.	<table border="1"> <thead> <tr> <th>Trees</th> <th>2023–24</th> <th>2024–25</th> <th>2025–26</th> <th>2026–27</th> <th>2027–28</th> </tr> </thead> <tbody> <tr> <td>Annual</td> <td>551</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Cumulative</td> <td>551</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% of Goal</td> <td>7.3%</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Trees	2023–24	2024–25	2025–26	2026–27	2027–28	Annual	551					Cumulative	551					% of Goal	7.3%				
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TIP-10	Cold water Refugia	Evaluate and update the inventory and mapping of coldwater refugia in the Lower Willamette River in Portland.	By the end of the TIP cycle	Provide status updates	Annually evaluate new temperature data collected during the year and identify new coldwater refugia where indicated by the data.	Completed FY 2023–24: Reviewed available temperature data. No new coldwater refugia were identified.																								

Table 4.1: Goals and Targets for Temperature TMDL Strategies

Goal ID	Category	Target/Description	Timeline (Goal)	Performance Metrics	Interim Milestones and Timelines	Reporting Activities					
TIP-11	Hydrologic Connectivity (Watershed Restoration)	Advance five restoration projects through the project development cycle. Restoration projects may address canopy closure, enhancing refugia, removing heat source due to water impoundment, groundwater recharge, and/or protecting springs/coldwater sources. ³	By end of TIP cycle	Projects planned, designed, and/or constructed (#)	Advance one project per year to the next project phase.	See Table 4.2 below for a list of projects, including status and description for each.					
N/A	Partnership Restoration Activities	Plant native trees and shrubs in natural and riparian areas by community and non-profit groups.	N/A	Plantings (#)	This activity was not originally included in the City's 2023 TIP; however, planting native trees and shrubs contributes to improved stream temperatures. Activities funded by the City and conducted by partner organization are presented here.	Plantings	2023–24	2024–25	2025–26	2026–27	2027–28
						Annual	14,407				
						Cumulative	14,407				
N/A	Partnership Restoration Activities	Perform management, assessment, and treatment of invasive species by community and non-profit groups.	N/A	Acres managed, assessed, and treated	This activity was not originally included in the City's 2023 TIP; however, invasive species management and treatment contribute to improved stream temperatures. Activities funded by the City and conducted by partner organization are presented here.	Acres	2023–24	2024–25	2025–26	2026–27	2027–28
						Annual	5.8				
						Cumulative	5.8				

1. Feasibility of land acquisition depends on willing sellers and real estate markets for land acquisition, landowner permissions, and availability of funding.

2. Land acquisition values include purchased properties and conservation easements secured.

3. Feasibility of project advancement depends on willing sellers and real estate markets for land acquisition, landowner permissions, availability of funding, and the permitting process. The project development process is typically composed of five phases (conceptual, 30%, 60%, and 90% design phases, followed by construction).

Table 4.2: Projects for Temperature Goal TIP-11 Hydrologic Connectivity (Watershed Restoration)

Project Name	Previous Report Year	Status*	Current Report Year	Description and Benefits
Springwater Wetlands and Floodplain Restoration Project <i>Johnson Creek</i>		Final Design		The Springwater Wetlands and Floodplain Restoration Project will restore wetland habitat on publicly owned property, improving habitat for wildlife and reducing flood risk to local homes and businesses. The project is located east of the I-205 freeway in the Lents and Powellhurst-Gilbert neighborhoods and builds on two previous floodplain restoration projects along Johnson Creek. Areas with artificial fill will be removed from the project area, which will expand the wetland habitat and flood storage within City property. Invasive vegetation will be removed, and native trees, shrubs, and wetland plants will be installed along with wood piles, snags, and amphibian logs to promote healthy habitat. Once complete, this project will hold more floodwater on public land, reducing flood risk to local homes and businesses along Johnson Creek. <i>Benefits: Floodplain connectivity, invasive species management, native plantings, wetland habitat, wildlife habitat.</i>
Miller Creek Fish Passage Improvement Project <i>Willamette Tributaries</i>		Final Design		Miller Creek is a coldwater tributary to the Willamette River that originates in Forest Park, where much of the watershed is forested with little impervious area. Miller Creek supports a healthy population of cutthroat trout and is the only Forest Park stream where anadromous salmon have been found; however, the culvert underneath a driveway at the marina presents a partial passage barrier for anadromous fish. The Miller Creek Fish Passage Improvement Project will replace the existing aging culvert, remove invasive vegetation, and restore important fish passage and habitat to one of the larger coldwater tributaries in the area. Once completed, this project represents an opportunity to maximize the recovery of Endangered Species Act-listed salmon in Miller Creek and may move Miller Creek closer to becoming a designated Salmon Sanctuary. <i>Benefits: Fish passage barrier removal, invasive species management, native plantings, salmon sanctuary.</i>
West Lents Floodplain Restoration Project <i>Johnson Creek</i>		Final Design		This project reconnects a straightened reach of Johnson Creek to its historic floodplain in Southeast Portland. It is designed to improve stream habitat complexity and hydraulics by returning the channel pattern to follow its historic meander and adding large wood. Invasive species treatment and riparian plantings are planned. BES has already successfully purchased 13 private properties in the project area and removed the buildings in the floodplain. <i>Benefits: Floodplain connectivity, channel form, large wood, instream cover, invasive species management, native plantings.</i>
Johnson Creek Oxbow Restoration Project <i>Johnson Creek</i>		60% Design		The Johnson Creek Oxbow Restoration Project is part of a broad city effort to improve habitat conditions and reduce the impacts of flooding along Johnson Creek. It will build on four previous restoration projects in the area: Tideman-Johnson (2006), Errol Heights Wetlands (2007), Errol Creek Confluence (2009), and the Johnson Creek Oxbow Scour Repair (2019). These efforts to restore Johnson Creek focus on returning it to a more natural state by removing the Works Progress Administration levee to reconnect and restore the surrounding floodplains, restore instream habitat in Johnson and Errol Creeks, and improve fish passage through the existing fish ladder. <i>Benefits: Floodplain connectivity, channel form, large wood, instream cover, invasive species management, native plantings, fish passage.</i>
Brookside Wetland Retrofit Project <i>Johnson Creek</i>		Conceptual Design		Located along SE Foster Road near the intersection of SE 110th Avenue, the existing Brookside Wetland includes a relatively shallow inline pond that contributes warm water to Johnson Creek. A sediment bar has formed across the mouth of the pond and exacerbates warming by impounding creek flow and creating stagnant open water conditions. This project will improve summertime temperature conditions in Johnson Creek, as well as high-flow conditions to protect against erosion and remove safety risks associated with nuisance camping in flood-prone areas. <i>Benefits: Floodplain connectivity, large wood, instream cover, invasive species management, native plantings, reduced stream temperature.</i>
Eastbank Crescent <i>Willamette River</i>		Conceptual Design		The City is working with partners on the Eastbank Crescent project, a large riverbank restoration effort on the Willamette River near the Oregon Museum of Science and Industry. The Eastbank Crescent Plan was approved by the City Council in June 2017, and the City is exploring funding the project as a mitigation bank. While the project does not have direct coldwater inputs, it will include large wood structures installed into a laid-back bank with native vegetation, creating micro-refugia and shaded riverbanks. The City's strategy is derived from sampling at Sellwood Park that found high densities of juvenile salmonids in areas of submerged vegetation, even when coldwater inputs are absent. The project has potential as a pilot for how to create (versus enhance existing) coldwater refugia, given its similarity to habitat conditions common throughout Portland. <i>Benefits: Coldwater refugia, large wood.</i>
Crystal Springs Lake <i>Johnson Creek</i>		Conceptual Design		The City is actively working with the U.S. Geological Survey to model temperatures in Crystal Springs Lake—a known heat source located at the headwaters of Crystal Springs Creek. The City will be using the results of lake temperature modeling to develop restoration scenarios to reduce heat loads to the stream and keep the entire 2.3 miles of Crystal Springs Creek below 18°C year-round. <i>Benefits: Coldwater refugia, salmon sanctuary, removal of heat sources.</i>

* Design typically comprises four phases: Conceptual, 30%, 60%, and 90%.

Gray markers indicate status in the previous report year. Black arrows indicate status in the current report year.

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