



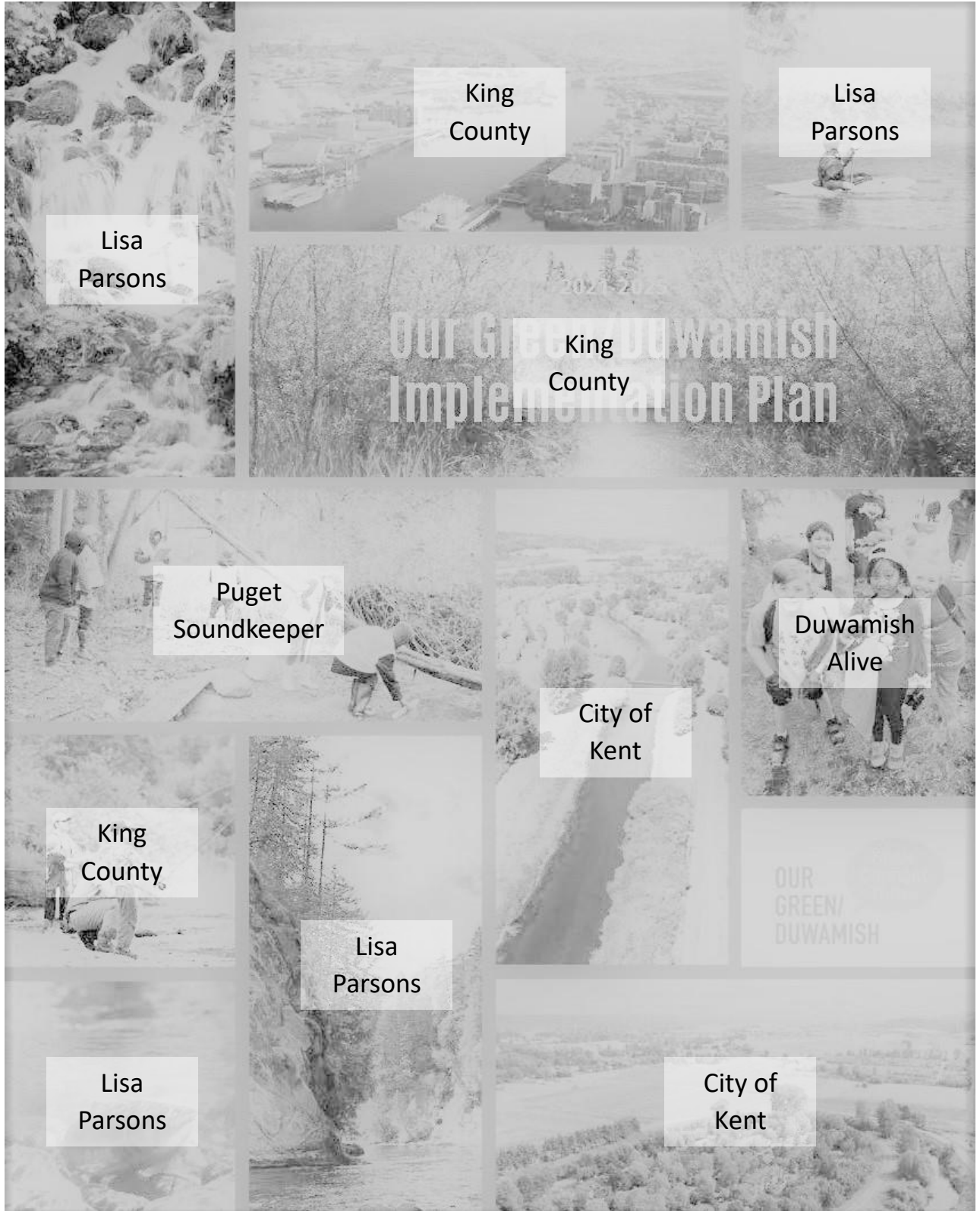
2021-2025

Our Green/Duwamish Implementation Plan



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This plan was prepared by the Coalition of Our Green/Duwamish Partners. It represents a collaborative effort that would not have been possible without input from numerous people who have contributed their skills, knowledge, and time in its preparation.

In addition, thank you to everyone who provided photographs for this plan.

Green/Duwamish Watershed stormwater experts, organizations and community representatives spent dozens of hours participating in workshops to develop this Implementation Plan.

This page is dedicated to thanking them all.

We are making progress. All the time. Thank you for your continued dedication to improving the health of the Watershed.

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Definitions

Definitions of key terms and a Glossary of acronyms.

Key terms

TABLE 1: TABLE OF KEY TERMS

| Term | Definition |
|---------------------------|---|
| Adaptive management | A framework that establishes a feedback loop of action, assessment, and adaptation to address uncertainties and identify current and timely best courses of action. This structure allows the Our Green Duwamish (OGD) Coalition to learn from our work and continue to improve upon the outcomes of our actions with new information when it becomes available. |
| Advisory Team | The Advisory Team includes representatives from King County, City of Seattle, and the Washington State Department of Ecology (Ecology), who participate in strategic planning for the OGD Coalition meetings and work products. |
| Aligned programs | A set of programs with a common purpose that help to support a common outcome. |
| Co-design | A method which goes beyond the traditional consultation approach and encourages organizations to work together to refine ideas and develop agreement ownership and commitment among participants. This type of partner cooperation manifests itself as collaboration and joint action towards the shared vision and goals for the Green/Duwamish Watershed (Watershed). |
| Core Team | The Core Team is comprised of staff from King County. This team is responsible for organizing and facilitating the Advisory Team meetings and the OGD Coalition meetings. In addition, the Core Team synthesizes input to develop OGD products through a co-design approach. |
| OGD Coalition (Coalition) | The group of all Partners working together to carry out the vision for the Green/Duwamish Watershed-Wide Stormwater Management Strategy. |
| Partner | An agency, organization, or jurisdiction within the Watershed that works on stormwater management within the Watershed and whose goals align with the Coalition. |
| Priority toxics | Chemical substances found at the Lower Duwamish Waterway site that the Environmental Protection Agency (EPA) has determined pose an unacceptable risk to human health or the environment. |
| Regional partnership | A separate regional collective that has programs, goals, and objectives that align with the Coalition's work in the Watershed. |
| Watershed | The Green/Duwamish watershed |

Acronyms

BMP: Best management practice

CABS: Compost Amended Biofiltration Swale

CAP: Chemical action plan

CSO: Combined sewer overflow

DRCC: Duwamish River Cleanup Coalition

ECOSS: Environmental Coalition of South Seattle
EIM: Environmental Information Management
EPA: Environmental Protection Agency
ESJ: Equity and Social Justice
GSI: Green stormwater infrastructure
HRM: Highway Runoff Manual
IDDE: Illicit Discharge Detection and Elimination
LID: Low impact development
LDW: Lower Duwamish Waterway
LTCP: Long-Term Control Plan
MS4: Municipal separate storm sewer system
NPDES: National Pollutant Discharge Elimination System
O&M: Operations and maintenance
OGD: Our Green/Duwamish
PSRC: Puget Sound Regional Council
SAM: Stormwater Action Monitoring
SFAP: Stormwater Financial Assistance Program
SMAP: Stormwater Management Action Planning
SPCC: Spill Prevention Control and Countermeasure
STORM: Stormwater Outreach for Regional Municipalities
SWG: Stormwater Work Group
SWM: Surface water management
TAPE: Technology Assessment Protocol – Ecology
TNC: The Nature Conservancy
TMDL: Total maximum daily load
UW: University of Washington
UWFP: Urban Waters Federal Partnership
WAG: Watershed Advisory Group
WDFW: Washington Department of Fish and Wildlife
WQBE: Water Quality Benefits Evaluation
WRIA: Water Resource Inventory Area
WSDOT: Washington State Department of Transportation
WTD: Wastewater Treatment Division (King County)

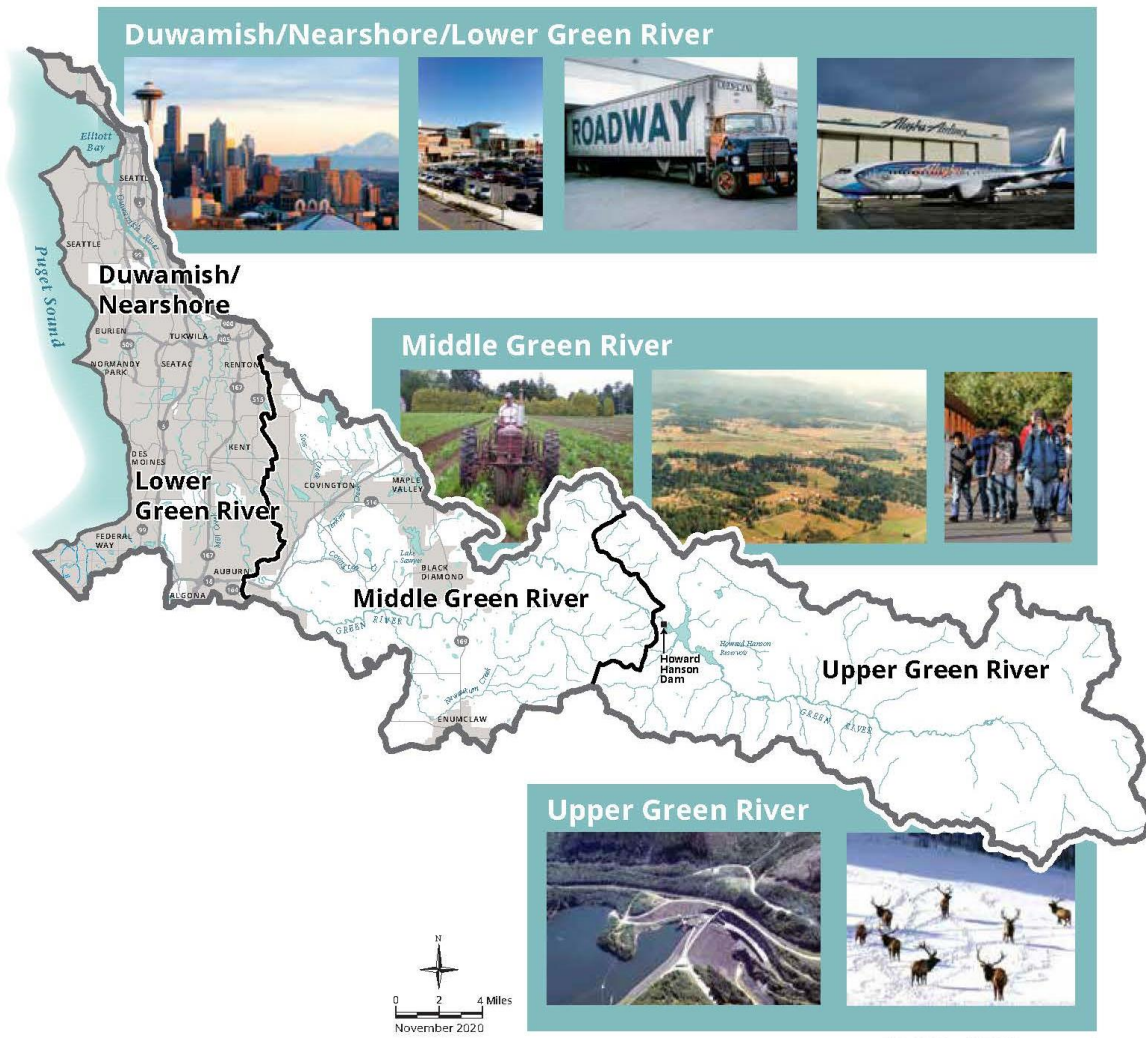
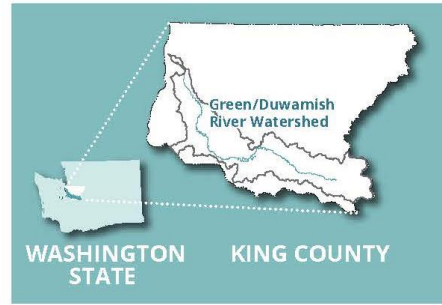


FIGURE 1: MAP OF THE GREEN DUWAMISH WATERSHED SHOWING THE TYPES OF LAND USE AND LOCATION WITHIN WASHINGTON STATE

Executive Summary

Our Green/Duwamish (OGD) is a coalition of Partners focused on improving stormwater management in the Watershed. This Implementation Plan represents a coordinated and collaborative regional effort to identify and describe current actions intended to make progress on restoring stormwater quality and controlling stormwater quantity over the next five years (2021-2025) and beyond.

As the first watershed-wide stormwater management implementation plan for the Watershed, this document was designed to be intentional about identifying the targets and actions necessary for measuring progress towards the Coalition's vision of managing stormwater runoff to support and enhance the environment, human health, and the economy. These targets and actions were iteratively co-designed by all members of the Coalition over a 36-month period.

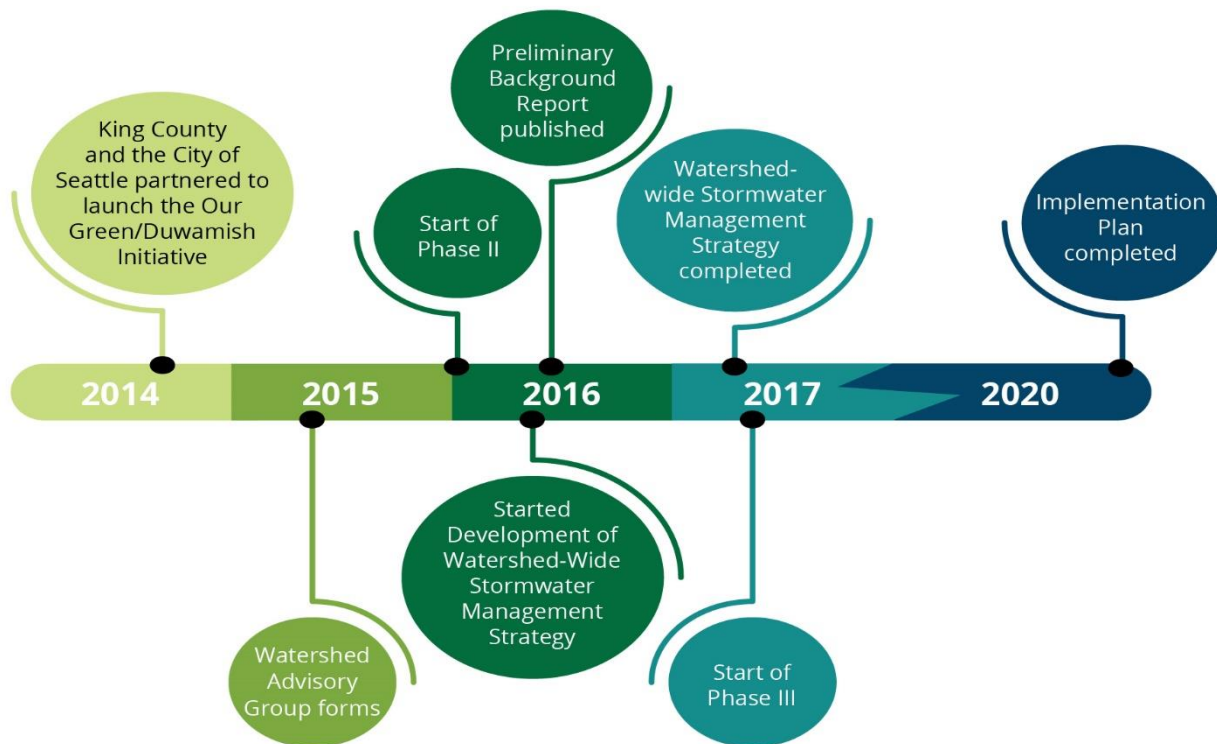


FIGURE 2: TIMELINE OF OGD MILESTONES

This work began in 2014, when King County and the City of Seattle partnered to develop strategies to strengthen communities and accelerate improvements to air, land, and water conditions by better coordinating efforts in the Watershed. Our Green/Duwamish emerged as the strategic effort focused on improving the regional quality and quantity of stormwater runoff. Since then, over 30 different organizations and agencies have partnered to create a shared vision for work in the Watershed and produce this Implementation Plan.

The Partners, representing local, state, and federal government, as well as non-profit organizations and businesses, bring a variety of strengths to the Coalition, ranging from community engagement and advocacy to data collection, regulatory tools, on-the-ground field work, and more. The Coalition, made up of representatives from all active Partners, meets every other month to develop OGD products, such as this plan, through a co-design approach. The Advisory Team, comprised of representatives from King County, City of Seattle, and the Department of Ecology, works on strategic planning for Coalition meetings and OGD more broadly. A Core Team of King County staff organizes and facilitates meetings and collaborative activities for the Coalition and synthesizes OGD products. Subgroups are formed as needed to tackle specific tasks or functions identified by the Coalition.

The Coalition is guided by a mission statement co-created by the Partners, and organizes its work into seven goals:

- Goal 1: Reduce priority toxics and other pollutants discharging to receiving waters.
- Goal 2: Foster partnerships, broad participation and collaboration amongst Watershed Partners and communities.
- Goal 3: Increase access to existing data, research and resources.
- Goal 4: Restore natural hydrologic functions through reduction in uncontrolled stormwater runoff flows.
- Goal 5: Increase innovation in stormwater runoff management.
- Goal 6: Increase awareness and an understanding of stormwater runoff management.
- Goal 7: Build a coalition or collaborative entity to carry out the vision for the Green/Duwamish watershed-wide stormwater management strategy.

All goals integrate a pro-equity approach and build on current stormwater management actions to achieve multiple benefits whenever possible.

Each of the seven goals are addressed in separate chapters of this Implementation Plan. These chapters describe the problem, a future desired by Partners, and the types of metrics OGD can use to establish a baseline understanding of progress towards achieving each goal. Additionally, each chapter includes lists of actions and targets that Partners plan to accomplish and articulates recommended areas of interest to focus efforts in the future.

In addition to the recommendations put forth for future work within each goal, the Coalition prioritizes future actions that may provide multiple benefits to more than

one goal or aligned program and help to achieve the Desired Future States articulated for the seven OGD goals. Prioritization of work can be supported by tools already developed and listed under Goal 3, or that may be developed by the Coalition in the future.

An adaptive management framework makes use of an annual and 5-year review cycle as an iterative sequence of action, assessment, and adaptation. This allows OGD to address uncertainties and identify best courses of action to take and to learn along the way while accomplishing work in the near term.

The annual review involves a brief survey of planned actions and targets set by Partners for their own work. This process helps focus near-term work on what is realistic, relevant, and effective according to the best available information. A more extensive five-year review, undertaken by the Coalition, will revisit OGD's organizational structure, mission, vision, goals, uncertainties, and data gaps to reassess plans and make changes based on what was learned in the previous five-year cycle. The five-year review process will update this Implementation Plan for the next five-year period.

Superficially, this plan is simple and straightforward with Partners continuing their stormwater management work to improve water quality and the health of the Watershed. Below the surface lies a more complex and inspiring effort to collaborate and design a future – full of clean and abundant water – by focusing our work in a more meaningful and unified way.

Background

In September 2014, King County and the City of Seattle partnered to launch the Our Green/Duwamish (OGD) initiative to develop strategies to strengthen communities and improve air, land, and water conditions in the Green/Duwamish Watershed. This initiative intended to increase coordination of current work in the Watershed at the local, state, and federal levels to manage habitat restoration, salmon recovery, flood control, stormwater management, public health, social equity, environmental cleanups, economic development, open space preservation, water quality and more.

Phase I of the initiative included over a year of initial background research and community meetings. In May 2015, the Watershed Advisory Group (WAG) was formed, comprised of representatives from more than 40 environmental groups, community-based organizations, business leaders, trade unions, urban planners, public health organizations, regulatory agencies, tribes, and elected officials. The WAG was assembled to help inform and craft the Green/Duwamish watershed-Wide Stormwater Management Strategy as well as provide input on equity considerations in the Watershed, helping to frame important focal populations and issues for engagement efforts. Phase I of the initiative included a year of initial background research and community meetings that culminated in a [Preliminary Background Report](#), published in June 2016 (OGD 2016). This report provided a summary of current conditions and existing plans and programs active in the Watershed. It also recommended creating a watershed-wide stormwater management strategy to reduce priority toxic pollutants that impact human health and the environment.

In January 2016, Phase II commenced with more than 30 different Partners convened to collaborate on creating key components of the Green/Duwamish Watershed-Wide Stormwater Management Strategy. During the workshops, participants examined the current state of stormwater management in the Watershed, created a vision of stormwater management for the future, and identified targets and strategies to



FIGURE 4: PHASE II OGD STORMWATER STRATEGY

achieve the desired outcomes of regional stormwater management approaches that support and protect a cleaner, healthier Watershed.

The collective outcomes resulted in a vision and mission statement for the stormwater strategy. A summary of the strategy can be found in Appendix A. The Partners identified existing work in the Watershed and identified gaps in stormwater management. Current actions and gaps were grouped into seven goals. Specific objectives and strategies to achieve the overall vision for the Watershed were identified under each goal. The [Green/Duwamish Watershed-Wide Stormwater Management Strategy](#) was completed in April 2017 (OGD 2017).

The Watershed-Wide Stormwater Management Strategy reflects the first step in developing a comprehensive stormwater management plan for the Watershed. It represents an effort by Partners who engaged effectively together as a single group to explore potential stormwater management actions suitable for watershed-scale implementation. It summarizes the purpose, vision, goals, objectives, and strategies for the Watershed and outlines several recommendations for the Coalition to pursue.

Phase III of the OGD initiative, which started in April 2018, focused on the creation of this Implementation Plan, which will direct the future work of OGD.

Current Organizational Structure

OGD is an informal organization representing multiple Partners doing stormwater management work within the Watershed, including but not limited to City, County, and State governments, non-profit organizations, and businesses. Most of these Partners were part of one or both previous phases of OGD and participated in developing the Watershed-Wide Stormwater Management Strategy described above.

OGD has four functional groups (Table 2). The Coalition, which includes all member organizations and agencies, supports Partners in fulfilling the OGD mission and directs the content of OGD products (including this Implementation Plan). The Advisory Team, which includes representatives from King County, City of Seattle, and the Washington State Department of Ecology, participates in strategic planning for OGD as an organization and reviews the content for Coalition meetings. The Core Team organizes and facilitates Coalition meetings and synthesizes input to develop OGD products through a co-design approach¹.

¹ The co-design strategy was supported by the Coalition at the meeting on February 7, 2019 and has been used consistently since then.

TABLE 2: FUNCTIONAL GROUPS WITHIN OGD

| Functional Group | Members | Meeting Frequency | Roles |
|------------------|--|-------------------|--|
| OGD Coalition | Representatives from all member organizations | Bimonthly | Directs organization function and content products |
| Advisory Team | King County, City of Seattle, Washington State Department of Ecology | Biweekly | Conducts strategic planning for OGD and reviews content for Coalition meetings |
| Core Team | King County | Weekly/As needed | Organizes and facilitates Coalition meetings and synthesizes OGD products |
| Subgroups | Subset of interested Partners, facilitated by Advisory Team representative | As needed | Perform specific functions or tasks identified by the Coalition |

Subgroups are formed to serve specific tasks or functions that have been identified by the Coalition. These groups are comprised of interested Partners and are facilitated by representatives from the Advisory Team. There are currently two subgroups: a Mapping Subgroup that is developing the OGD mapping tool described later in the Implementation Plan (see actions in Goal 3) and a Coordination Subgroup that is tracking separate regional partnerships with complimentary goals to OGD to promote synergy and identify opportunities for multiple benefits (see actions in Goal 2). The Coordination Subgroup regularly engages with regional partnerships within the Watershed that are working on programs that align with OGD. These regional partnerships include, but are not limited to:

- Water Resources Inventory Area 9 (WRIA 9),
- Ecology’s Pollutant Loading Assessment,
- Stormwater Outreach for Regional Municipalities (STORM),
- Green-the-Green Network,
- Duwamish Alive Coalition,
- University of Washington (UW) Climate Impact Group,
- Washington Stormwater Center,
- King County Pollution Identification and Correction Alliance, and
- Ecology’s Watershed Restoration Enhancement Committee.

The Coordination Subgroup is continually evaluating other potential partnerships within the Watershed to collaborate and align mutual goals. The Coordination Subgroup also aims to engage with organizations that are not currently participating formally in OGD as active Partners but are integral members of the Green/Duwamish

community and have a voice that needs to be included in OGD planning efforts, such as this Implementation Plan.

Partners

Organizations and agencies that have participated in the process of developing this Implementation Plan and are committed to advancing efforts in the Watershed are listed below:

| | |
|--|---|
| The Boeing Company (Boeing) | Futurewise |
| City of Auburn | The Nature Conservancy (TNC) |
| City of Black Diamond | King County |
| City of Burien | Puget Soundkeeper |
| City of Covington | Puget Sound Regional Council (PSRC) |
| City of Des Moines | Stewardship Partners |
| City of Enumclaw | Urban Waters Federal Partnership (UWFP) |
| City of Federal Way | Washington Department of Ecology |
| City of Kent | U.S. Environmental Protection Agency (U.S. EPA) |
| City of Maple Valley | U.S. Forest Service (USFS) |
| City of Normandy Park | Washington Department of Fish and Wildlife (WDFW) |
| City of Renton | Washington State Department of Transportation (WSDOT) |
| City of Seattle | Washington Environmental Council (WEC) |
| City of SeaTac | Watershed Resource Inventory Area 9 (WRIA 9) |
| City of Tukwila | |
| Duwamish River Cleanup Coalition (DRCC) | |
| Environmental Coalition of South Seattle (ECOSS) | |
| Forterra | |

Organizational Strengths

The current OGD Coalition represent a broad range of organizations with many different strengths. OGD is intended to provide a method for collaboration so that the Watershed can benefit from sharing information and leveraging the strengths of each Partner. Some of the organizational strengths relevant to this collaborative effort are:

- Engagement with businesses, residents, elected officials, and community volunteers;
- Community-based advocacy;

- Infrastructure and project management;
- Operations and maintenance;
- Field work and equipment;
- Data collection and analysis;
- Regulatory tools and compliance;
- Grant writing and funding opportunities; and
- Innovation and research.

Implementation Plan Orientation

Between April 2018 and November 2020, the OGD Coalition has focused on the development of this Implementation Plan, which makes steps to realizing the Watershed-Wide Stormwater Management Strategy that was developed in Phase II. The Implementation Plan was developed with content generated at Coalition meetings that was then synthesized by the Core Team and ultimately reviewed again by the Coalition. This Implementation Plan identifies planned actions that Partners and OGD functional groups are implementing and provides recommendations to guide the Coalition over the next five years.

The purpose of this Implementation Plan, as defined by the Coalition, is to:

- Allow for a watershed approach to stormwater management by improving consistency and coordination,
- Establish a strategy for prioritization of actions,
- Facilitate partnership opportunities by improving transparency and identifying ways to work collaboratively,
- Help tell the story of stormwater work in the Watershed for the community and improve funding opportunities,
- Provide direction for actions in the Watershed,
- Define success and what should be measured, and
- Keep the Coalition focused on moving towards our vision.

This Implementation Plan is organized into the following sections:

- Introduction – describes the history of the plan, who has been involved, the organization of the Implementation Plan, and the guiding statements².
- Goal Sections – includes problem statements³, the Desired Future States⁴, outcome metrics⁵, planned actions⁶, and recommendations⁷ for each of the

² The content of this section was adapted from the Phase II report (OGD 2017).

³ These were adapted from the Phase II report (OGD 2017).

⁴ Desired Future States were developed collaboratively at Coalition meetings in August and September 2019.

seven goals. defined in the Watershed-Wide Stormwater Management Strategy (OGD 2017).

- Ongoing work – describes the recommended prioritization of future actions⁸, and our adaptive management approach⁹.

Recommendations

The Recommendations section after each goal are a recognition that work, in addition to the listed actions, must be completed to reach the Desired Future State for each goal. In June 2020, Partners completed a survey to solicit feedback on what additional work should be considered and how it should be prioritized. These ideas were consolidated and presented to the Partners at the September 2020 Coalition meeting.

The Partners reviewed these recommended actions during the September 2020 meeting, refined the content to be as comprehensive and detailed as possible, and then summarized the recommendations. These summaries are included in the Recommendations section after each goal. For the full list of unedited content from the September 2020 meeting, see Appendix B.

Guiding Statements

The OGD vision, mission, goals, are grounded in an overarching approach emphasizing principles of pro equity. They were developed by the Coalition in Phase II and represent the guiding statements for this Implementation Plan¹⁰.

Vision Statement

In the Green/Duwamish Watershed, stormwater runoff is sustainably managed to support and enhance the environment, human health and the economy.

Mission Statement

Partners will improve and accelerate watershed-scale stormwater runoff management actions in the Green/Duwamish Watershed, collaboratively, with

⁵ Metrics of progress towards Desired Future States were generated by the Partners at a Coalition meeting on December 12, 2019 and synthesized by the Core Team.

⁶ Between December 2019 and September 2020, each partner agency and organization submitted actions they plan to take under each strategy and set targets for their own performance.

⁷ Recommendations were generated by the Coalition in April 2020 and refined in a collaborative activity at the meeting on September 17, 2020 and in subsequent review by Partners.

⁸ These priorities were synthesized from the Phase II report (OGD 2017) and input from the Coalition meeting on February 7, 2019.

⁹ The adaptive management approach was chosen by the Coalition at the meeting on June 13, 2019.

¹⁰ Phase II report (OGD 2017).

community, jurisdictions, agencies, nonprofits and businesses. Partners will manage the quality and quantity of stormwater runoff by:

- Preserving and restoring receiving waters;
- Securing sustainable funding resources;
- Aligning non-regulatory and regulatory interests;
- Advancing equity, social justice and the economy; and
- Prioritizing actions with multiple benefits.











Goals

- Goal 1: Reduce priority toxics and other pollutants discharging to receiving waters.
- Goal 2: Foster partnerships, broad participation and collaboration amongst Watershed partners and communities.
- Goal 3: Increase access to existing data, research and resources.
- Goal 4: Restore natural hydrologic functions through reduction in uncontrolled stormwater runoff flows.
- Goal 5: Increase innovation in stormwater runoff management.
- Goal 6: Increase awareness and an understanding of stormwater runoff management.
- Goal 7: Build a coalition or collaborative entity to carry out the vision for the Green/Duwamish Watershed-Wide Stormwater Management Strategy.

Action Icons

The icons listed below are meant to be quickly comprehensible symbols to assist with better understanding the purpose of each specific action. They are intended to help the reader orient to the type of action being described and do not describe each action in its entirety, but rather, speak more to the intended outcome. Examples of actions represented by each icon are provided here:

TABLE 3: ACTION TYPE ICON DESCRIPTIONS

| Icon Symbol | Icon Name | Icon Description |
|---|-----------------------|---|
|  | Research/Reports | Research and studies conducted to evaluate stormwater management activities as well as reports, articles, publications, policy plans published about stormwater management practices. Also includes new and existing rules, guidance, and manuals related to stormwater management. |
|  | Maintenance | Stormwater system cleaning, pollutant removal programs, sampling and inspection of stormwater system, and field screening. |
|  | Regulatory Compliance | Compliance with federal, state, and local regulations, including compliance with National Pollutant Discharge Elimination System (NPDES) permit requirements and superfund cleanup. |
|  | Technical Assistance | Inspections of businesses and stormwater facilities, spill response and preparedness, pollution identification, providing spill kits to businesses, technical assistance to businesses and property owners with stormwater best management practices. |
|  | Infrastructure | Stormwater retrofits, capital projects, and constructed stormwater infrastructure improvements. |
|  | Working Together | Collaboration and coordination among partners, working meetings, convening partners (i.e. conferences), regional partnerships, work groups, and task forces focused on improving how we manage stormwater. |
|  | Restoration | Tree plantings, land conservation and acquisition, noxious weed removal, and riparian habitat restoration actions. |
|  | Outreach | Increasing awareness of stormwater through educational events, community gatherings, trainings, and other outreach opportunities. |
|  | Data and Technology | Online tools including mapping and modeling tools as well as technology to track or improve stormwater quality. |
|  | Funding | Funding made available by and for partners as well as property owners and businesses for stormwater management. |

GOAL SECTIONS

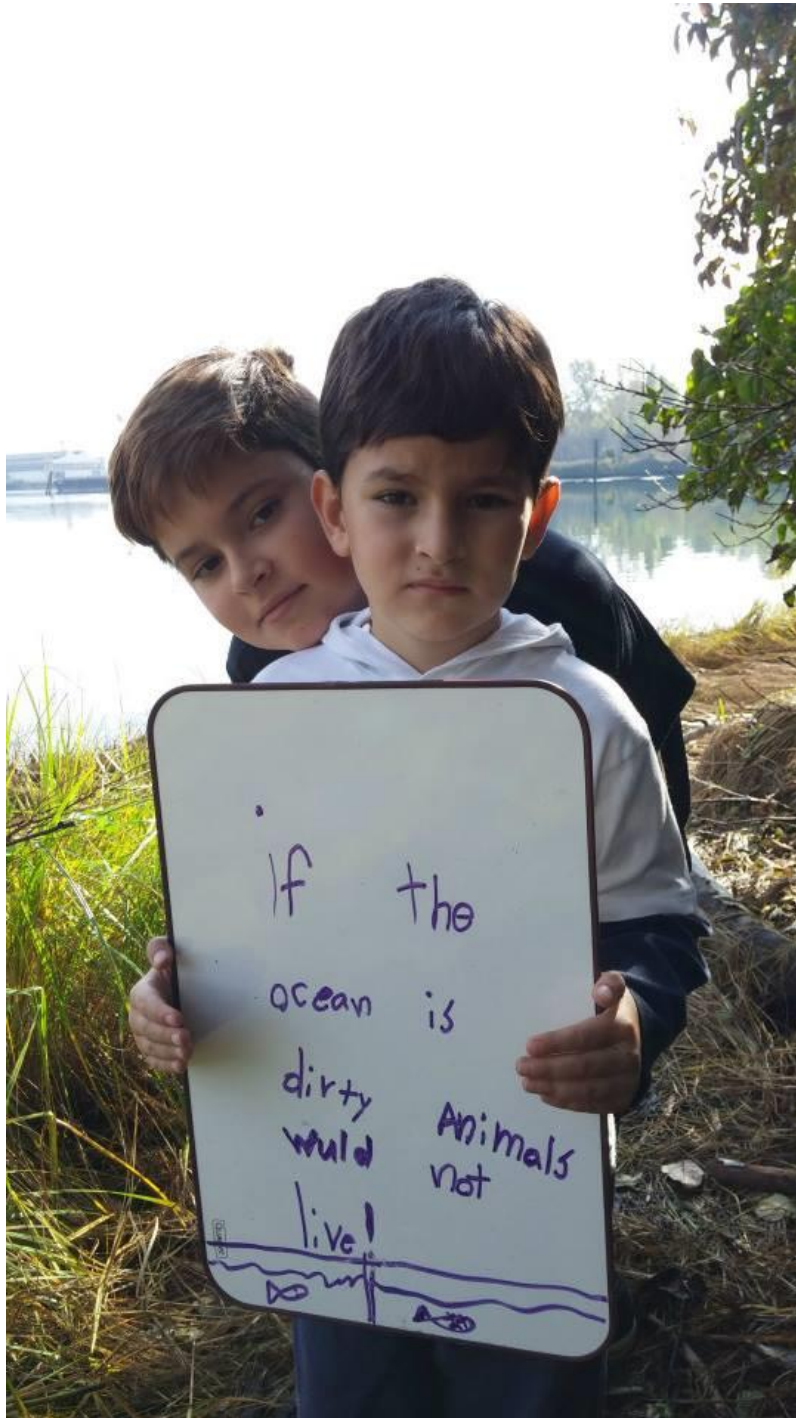


FIGURE 3: DUWAMISH ALIVE PARTICIPANTS FROM OCTOBER 2015 (PHOTO CREDIT: DUWAMISH ALIVE)

Goal 1: Reduce priority toxics and other pollutants discharging to receiving waters.

Problem Statement

Stormwater runoff transports priority toxics and other pollutants, degrading water quality and impairing streams, lakes, rivers and other waterbodies. Pollutants from impervious surfaces, legacy pollution in our existing stormwater infrastructure, and inadequate source control methods contribute to the loading of pollutants to local waterbodies. Currently, enhanced maintenance actions, such as street sweeping and stormwater system cleaning, are known to reduce toxics in stormwater and help lessen impacts on receiving waters, fish, wildlife and habitat. Increasing the use of maintenance actions and source control strategies throughout the Watershed can help reduce toxics and improve water quality.

Desired Future State

The discharge of toxics and other pollutants will be reduced to the degree that complies with the Clean Water Act and allows existing and future communities to enjoy safe and healthy opportunities for fishing, swimming, boating, and other recreation in the Watershed.

Outcomes Metrics

The data sources in the table below can be used to establish a baseline and track metrics that can be updated every five years to direct adaptive management.

| Metric | Data Source |
|----------------------------|---|
| Water quality - toxics | Lower Duwamish Waterway (LDW) Baseline Data |
| Sediment quality - toxics | LDW Baseline Data |
| Fish tissue - toxics | LDW Baseline Data |
| Water quality - bacteria | King County Stream Monitoring |
| Beneficial uses attainment | 1. Waterbody impairments 2. Watershed Characterization |

Goal 1∞ Objective 1

Goal 1 Planned Actions

Objective 1: Improve source control across multiple sectors (commercial, industrial, agriculture, residential).

Strategy a) Expand and prioritize business inspections to ensure stormwater best management practices (BMPs) are in use.



Strategy b) Work with agricultural communities to support the use of stormwater BMPs in agricultural operations.

Strategy c) Expand data-driven source tracing programs (e.g., Seattle’s storm solids tracing).






Strategy d) Work with the legislature to test and ban products/chemicals to address known pollution sources and materials.

Strategy e) Develop a plan to address known sources in commonly used stormwater management materials (e.g., change material specifications).







TABLE 4: GOAL 1 – OBJECTIVE 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|---|---|----------|--|--|
|   | Business source control inspection programs | A commercial inspection program of all businesses and property types with the potential to convey pollutants to the municipal separate storm sewer system (MS4) as identified in Appendix 8 of the Phase II Municipal NPDES permit. | a | City of Auburn, City of Black Diamond, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of Tukwila | Inspect 20% of businesses annually within the jurisdictional boundaries beginning in 2023. |








Goal 1∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|---|--|----------|---|---|
|   | Business source control inspection programs <i>(continued)</i> | Conduct periodic inspections of industrial and construction permittees. | a | Ecology | Conduct all planned periodic inspections of Industrial NPDES permitted properties in the Watershed. |
| | | A commercial inspection program of all businesses and property types with the potential to convey pollutants to the MS4 as identified in Appendix 8 of the Phase I Municipal NPDES permit. | | City of Seattle, King County | Annually inspect 20% of businesses within the jurisdictional boundaries. |
| | | More intensive business inspections and solids sampling from on-site catch basins to address sources of pollutants that are the contaminants of concern for the LDW Superfund clean-up. | | City of Seattle | In the LDW, annually conduct enhanced business inspections at approximately 100-125 businesses and collect 75 solid samples from the MS4. |
|   | LDW Superfund Sediment Cleanup | Implementing EPA's sediment cleanup plan. The remedial actions will clean up contaminated sediments in the waterway and thus reduce human health risks associated with the exposure to contaminated sediment and the consumption of contaminated resident fish and shellfish. The cleanup actions will be protective of animals that live and feed in the LDW. | a, c | Boeing, City of Seattle, King County, Port of Seattle | Finalize remedial design of the upper reach of the LDW and begin construction in 2024. |
| | | Implement Ecology's LDW drainage basin source control actions to support in-waterway Superfund cleanup actions. | a, c | Boeing, Ecology, King County, and City of Seattle | Ongoing. |
|  | Pollution litigation | Legal action against known polluters along the LDW. | a | Puget Soundkeeper | Weekly boat patrols and enforcement as needed. |






Goal 1∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|---|--|----------|---|---|
|  | Business BMP technical assistance | Conduct non-regulatory inspections of businesses that have potential to generate pollutants or hazardous wastes through partnership with King County Hazardous Waste Management Program. Provide information about properly containing and disposing of chemicals and materials, provide free spill kits, and vouchers for purchasing BMP related materials. | a | City of Maple Valley, King County | Inspect all businesses that have potential to generate pollutants or hazardous wastes with storefronts in Maple Valley beginning in 2019. |
|   | Complaint based business inspections | Inspect pollutant generating business and sites identified through complaints. | a, c | City of Auburn, City of Burien, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Normandy Park, City of Seattle, City of Tukwila, King County | Inspect 100% of all sites identified through credible complaints starting in 2023. |
|  | DRCC's role as the Community Advisory Group for EPA | Review and ensure King County, City of Seattle, Ecology act on reports from the community, focusing on the Superfund site. Facilitating dialogue between regulators and community members. | a | DRCC | Host roundtable engagement webinars. Collect community input and submit to EPA. |
|   | Duwamish Waterway Stormwater Inspections | A program focused on inspecting properties draining to the LDW in an effort to prevent the discharge of toxics to the superfund site. | a | Ecology | Conduct all planned periodic inspections of permitted properties in the Watershed. |







Goal 1∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|---|----------|------------------------------|---|
|   | Pollution Prevention Assistance Program | The Pollution Prevention Assistance Program is a partnership of governments across Washington that provides free, hands-on assistance to help businesses identify, mitigate, and resolve potential pollution issues. | a, b | King County | Conduct approximately 410 total inspections. |
|    | King County's Lower Duwamish Source Control Implementation Plan | The plan describes a suite of actions to prevent pollutants from entering the LDW. These include activities that the County is implementing through its NPDES permits, Combined Sewer Overflow (CSO) control plan, regulatory authority, technical and educational programs for businesses and residents on ways to prevent pollutants from entering the LDW and sampling and source tracing of pollutants. | a, c | King County | Meet all expectations articulated in the Source Control Implementation Plan. |
|   | Source Trace Sampling in LDW, 2/4 | In-line sediment sampling in the South 96 th Street Corridor and 16 th Avenue South Bridge Basin. | a | City of Seattle, King County | S. 96 th Street Corridor Basin sampling will be conducted at three locations at least once in the year 2020. A solids grab sample at the 16 th Avenue South Bridge Basin will be collected once sufficient solids accumulate. |










Goal 1∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|---|--|----------|--|---|
|   | Source Trace Sampling in LDW, 2/4 <i>(continued)</i> | <p>City of Seattle conducts source tracing to determine the extent and location of contaminants within the drainage system. Sampling is designed to identify sources by sampling at key locations within these systems. Sampling generally starts at the downstream end of the system or at key junctions within the system and systematically moves upstream to identify sources. Data generated by the sampling program are used to:</p> <ul style="list-style-type: none"> • Identify sources of contaminants to the City-owned MS4 • Characterize the quality of storm drain solids discharged to the LDW for use in recontamination analyses • Identify and prioritize City-owned MS4 sections for cleaning. | a | City of Seattle | Source trace sampling activities are planned at 12 outfalls in the LDW for 2021-2026. |
|   | Field screening program | Inspection program of publicly-owned assets (properties, structural stormwater BMPs, and catch basins) to ensure they are functioning properly and preventing pollution from being conveyed to local receiving waters. | a | City of Auburn, City of Burien, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of Seattle, King County | Annually screen 12% of the known stormwater system for illicit discharges. |
|  | Boating Spill Kit Program | Program to provide spill response materials to boat owners and operators. | a | Puget Soundkeeper | 2,000 spill kits distributed annually. |







Goal 1∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|--|----------|--|---|
|   | Spill Kit Incentive Program | Originally started by City of Seattle, program provides free spill kits and training to businesses. | a | City of Seattle, ECOSS | Provide spill kits to all businesses found to be in need and choose to participate in the program. |
| | | ECOSS provides spill prevention and response support to small businesses, including spill response training, spill plans, site maps, spill poster in social marketing format with end of year regionally based annual report | | City of Auburn, City of Black Diamond, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Renton, City of SeaTac, City of Tukwila, ECOSS | Provide spill kits, support materials, and training in-language to all businesses found to be in need and choose to participate in the program. Video trainings available in 2020. 600 businesses visited annually. |
|   | Erosion Control Fall Assessments | Action performed on construction projects with a moderate to high level of erosion control related risks. | a | WSDOT | Performed annually on all qualifying sites. |
|   | Spill Prevention Control and Countermeasure (SPCC) Plan inspections and headquarters led assessments | SPCC Plan implementation on all construction projects per WSDOT Standard Specifications (project level). HQ SPCC Plan assessments performed annually on regionally selected construction projects (headquarters level). | a | WSDOT | Annual assessments on selected construction projects. |







Goal 1∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|--|--|----------|--|--|
|   | Road maintenance facility Stormwater Pollution Prevention Plan inspections | Inspection program designed to review the Stormwater Pollution Prevention Plans at 3 locations in the Watershed. | a | WSDOT | Semi-annual inspections at 3 locations (6 total inspections annually). |
|  | Technical assistance to agricultural landowners | Provide technical assistance to agricultural landowners on how to build BMPs that prevent stormwater runoff contamination. | b | King County | Provide technical assistance to all agricultural landowners that request assistance. |
|   | Agricultural BMP guidance Advisory Group | Advise Ecology on the identification and implementation of practices that support healthy farms and help farmers to meet clean water standards. | b | Ecology, King Conservation District, Puget Soundkeeper | 13 Voluntary Clean Water Guidance for Agriculture Chapters completed by 2024 |
|  | Sec. 319 grants to fund specific nonpoint projects | Provide grants to nonprofit groups working with agricultural landowners on installing agricultural BMPs. The funds come from the EPA and are around \$1.5M at the state level. | b | Ecology | Funding awarded. |
|  | Total Maximum Daily Load (TMDL) Alternative Program | Near-term water quality restoration plan that describes a schedule of actions and milestone stringent enough to attain bacteria water quality standards. | b, c | King County | Approved alternative plan by 2023. |
|   | Pollution Identification Control (PIC) program | An interagency program to eliminate sources of bacteria in the Watershed. | b, c | King County | Begin PIC approach to find and fix sources of fecal pollution in pilot basin by the end of 2021. |

Goal 1∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|--|----------|---|---|
|   | Targeted Pollutant Source Monitoring Programs | The City of Kent plans on sampling strategic locations in the drainage system to screen for pollutants. Source tracing will be conducted as needed based on findings. This proactive approach at source control may help the City of Kent better direct further efforts. | c | City of Kent | Sample runoff in Kent's MS4 at a minimum of ten locations by 2022. |
| | | Partially funding Seattle's source tracing program in the LDW, 1/1/19-6/30/21, with Stormwater Financial Assistance Program (SFAP) grant funding. | | Ecology | Provide \$111,587 funding for City of Seattle's source tracing program in the LDW. |
|   | Targeted Pollutant Source Monitoring Programs <i>(continued)</i> | City of Seattle collects solids samples from the MS4 annually to identify sources of pollution, select lines to be cleaned of solids and track the effectiveness of the source control program over time. | c | City of Seattle | 75 solid samples collected from the MS4 annually. |
|  | Stormwater Work Group (SWG) | The SWG develops and implements a sustainable, cooperative stormwater monitoring and assessment framework. | c | City of Auburn, City of Covington, City of Enumclaw, City of Kent, City of Maple Valley, City of Renton, City of Seattle, King County | Have full municipal representation (6 seats occupied) at all quarterly SWG meetings. |
|  | Low cost networked water quality sensor systems | Kokanee systems is developing technology to detect freshwater contaminants and help water quality professionals locate and eliminate their source. | c | Stewardship Partners | Launch a pilot in 2020 or identify a pilot project/ geography to seek funding around in 2021. |

Goal 1∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|---|---|----------|---------------------------|--|
|  | Automated spill notification system for state highways | Partnership with Washington State Patrol – piloted in Washington State Patrol Districts 1 and 2. This system allows Washington State Patrol to email a spill memo to jurisdictions when a spill has occurred on a state highway that may impact their stormwater system. | c | WSDOT | System set to move to statewide by spring 2021. |
|  | Illicit Discharge Detection and Elimination (IDDE) program per WSDOT's Permit | IDDE Program described in WSDOT's Stormwater Management Program Plan. | c | WSDOT | Respond to all complaints received. |
|   | Hazardous Waste & Toxics Reduction Program | Ecology's Hazardous Waste & Toxics Reduction Program works on providing guidance on safe alternatives to toxic materials, including the Product Replacement Program and implementing the Pollution Prevention for Healthy People and Puget Sound Act (substitute SB5135) through Ecology's Safer Products for Washington Program. | d | Ecology | Ongoing review of product safety, and final report on priority consumer products. |
|  | Chemical Action Plans (CAPs) | Participate on the Per- and Polyfluoroalkyl Substances (PFAS) Advisory committee to develop a CAP. | d | Ecology, King County | Completion of the final PFAS CAP, and monitoring future development for new or updated CAPs. |
|  | Toxics Work Group | Puget Sound Ecosystem Monitoring Program subgroup focused on contaminants of emerging concern. | d | Ecology, King County, TNC | Convene quarterly meetings. |

Goal 1∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|--|----------|---|---|
|  | Legislative policy review | Staff review legislative policy as needed. | d | City of Kent, City of Maple Valley, City of Seattle, Ecology, King County, TNC, Puget Soundkeeper, WRIA 9 | Ongoing – Bills reviewed during legislative session. |
|  | House Bill 3018/SB 6557 | Limiting the use of copper and other substances in vehicle brake pads. | d | City of Seattle | Passed – being phased in with the first Phase going into effect on January 1, 2021. |
|  | Annual Legislative Priorities | It has been an annual priority of the Watershed Ecosystem Forum to ask the state legislature to take actions and allocate funding to address pollution in the Green/Duwamish and Central Puget Sound watersheds. | d | WRIA 9 | Annual lobbying effort. |
|  | King County Surface Water Design Manual Updates | A manual that defines how to manage stormwater runoff and describes the development and redevelopment standards needed to comply with State law. | e | King County | Updated every 5 years. |
|  | Purchasing Specifications | City of Seattle, along with other City of Seattle Departments, has revised its purchasing specifications to place preference on the least toxic substances. | e | City of Seattle | Specifications reviewed and updated as needed. |
|  | Toxics Task Force | Creation of regional task force to support information exchange, access to resources, and training aimed at reducing toxics in the Watershed. | e | Ecology | Task force formed by 2023. |

Goal 1 ∞ Objective 1



FIGURE 4: RESPONSE TO PCB SPILL INTO THE STORMWATER SYSTEM (PHOTO CREDIT: CITY OF SEATTLE)

Goal 1∞ Objective 2



Objective 2: Increase and improve maintenance practices for stormwater infrastructure.

Strategy a) Repair and maintain stormwater facilities and conveyance systems.



Strategy b) Remove legacy and ongoing pollutants through enhanced stormwater maintenance practices such as pavement sweeping and conveyance line cleaning.

Strategy c) Research new maintenance methods and technologies to quantify pollutant-reduction benefits (i.e., green infrastructure maintenance).




TABLE 5: GOAL 1 – OBJECTIVE 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|--|----------|---|--|
|  | Phase II NPDES Catch Basin Inspection program | Inspect public catch basins using one or more methods defined in section S5.C.7.c.iii of the Phase II Municipal NPDES stormwater permit. Clean and maintain to standards. Screen for illicit discharges during inspections. Trace and abate as needed. | a | City of Auburn, City of Burien, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of Tukwila | An established program achieving at least 95% of required inspections or cleaning the entire system every 5-year permit cycle. |
|  | Phase I NPDES Catch Basin Inspection Program | Inspect all public catch basins. Clean and maintain to standards. Screen for illicit discharges during inspections. Trace and abate as needed. | a, b | City of Seattle, King County | Annual inspection (or regulatory alternative) of all catch basins owned and operated by the Permittee. |





Goal 1∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|--|---|----------|---|---|
|  | NPDES required Inspection and maintenance of all stormwater treatment and flow control BMPs/Facilities | Inspect all stormwater treatment and flow control BMPs/facilities (public and private) that discharge to the MS4. Maintain, or require private owner to maintain, facilities within 1 year when they exceed maintenance standards. | a | City of Auburn, City of Covington, City of Des Moines, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of Seattle, King County, WSDOT | Annually inspect all stormwater and flow control BMPs/facilities and perform maintenance within 1-year where necessary. |
|  | Building Technical Assistance Capacity for Green Stormwater Infrastructure (GSI) | Stewardship Partners will work with multiple Partners to increase the professional knowledge base around Green Infrastructure by supporting existing training programs and sharing technical expertise. ECOSS currently provides in-language GSI and RainWise education and technical support, and works specifically with Spanish, Vietnamese and Chinese language customers and contractors. | a | Stewardship Partners ECOSS | Provide GSI technical assistance to 25 properties and support 5-10 GSI projects on private property every year. In 2020 ECOSS will provide technical assistance for 30-50 landowners and communities, help them find a GSI contractor and navigate the Mini Grant program. In 2020 there are specific funds for Green/Duwamish properties that includes funding for outreach/technical assistance as well as implementation funding. |

Goal 1∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|----------------------------|--|----------|-------------------------------------|--|
|  | Street Sweeping Programs | Regular sweeping of public roads. | b | City of Kent, City of Normandy Park | Sweep all arterial roads in city. Sweep all collector/distributor lanes on priority basis; 50% annually. |
| | | Implement increased frequency street sweeping plan targeting high traffic corridors and state routes. | b | City of Maple Valley | Increased sweeping to occur beginning in 2021 from once every month to once every two weeks from January to April and September – October and weekly in November and December. |
| | | City of Seattle and Seattle Department of Transportation use regenerative air sweepers to remove pollutants from arterials in the LDW. | b | City of Seattle | Sweeping approximately every other week for a total of 29 sweeping events per year, for a total of 176 miles of roadway in the LDW and removing approximately 25 tons of solids from the streets in the LDW each year. |
| | | Regular sweeping of public roads. | b | City of Renton | Approximately every two months. |
|  | Sediment Removal Program | Track the amount of sediment removed by sweeping from highways and ferry terminals. | b | WSDOT | Annual amount removed. |
|  | MS4 line cleaning programs | City of Seattle removal of accumulated solids from MS4 pipe in basins that discharge to the LDW. | b | City of Seattle | Minimum of 4,000 linear feet of pipe cleaning in Green/Duwamish basin. |

Goal 1∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|---|----------|---------------------------------------|---|
|  | Stormwater Action Monitoring (SAM) effectiveness studies | Lead and partner on several SAM effectiveness studies. Participate as a member of the SWG effectiveness subgroup. | c | City of Seattle, Ecology, King County | Submit at least one proposal in 5 years to advance work in the Watershed. |
|  | Highway BMP Effectiveness study planned for 2021 | Research to evaluate the impacts of enhanced/increased maintenance on bioswale longevity. | c | WSDOT | Sampling set to begin in 2021. |
|  | Rain garden assessment protocol | Easy to use field protocol is intended to help interested citizens and local staff gather the necessary information to assess the performance of bioretention facilities and rain gardens. The information can be used to correct immediate problems and by stormwater system managers to inform long term maintenance and design considerations. | c | Stewardship Partners | Convert form to mobile by 2025. Utilization of the protocol by 10 different jurisdictions or utility staff. |
|  | Gray Notebook reporting | WSDOT tracks the amount of sediment removed from highways and ferry terminals via sweeping and reports the metrics in the Gray Notebook annually (fall edition). | e | WSDOT | Reported annually. |




Goal 1∞ Objective 3

Objective 3: Increase research on sources of priority toxics.





Strategy a) Research pollution sources affecting stormwater, air and soil (e.g., products, CECs, and PPCPs).

Strategy b) Increase research around effectiveness of stormwater treatment for both structures and activities.

TABLE 6: GOAL 1 – OBJECTIVE 3

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|--|--|----------|------------------------------|--|
|  | DRCC's Clean Air Program | Working with community to research and determine sources of air contamination that are detrimental to the health of the community and are negatively affecting stormwater quality. | a | DRCC, Ecology, TNC | Identify actionable next steps to improve air quality in the Duwamish valley by 2025. |
|  | Northwest Seaport Alliance clean air program | Taking part in meetings with the Northwest Seaport Alliance and reviewing and advocating for clean air to help avoid deposition of toxics that are ultimately picked up by stormwater. | a | DRCC | NW Seaport Alliance will take action towards cleaner air quality in the Duwamish Valley. |
|  | PLA (pollutant loading assessment) model for the LDW | Ecology is leading the development of a PLA model for the LDW to identify and prioritize areas that may contribute contaminants after Superfund cleanup. | a | Ecology, King County, WRIA 9 | Anticipated date of PLA model is scheduled to be completed in 2024. |

Goal 1∞ Objective 3

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|--|----------|--|--|
|  | Puget Sound Regional Status and Trends Monitoring | Payment to Ecology for the ongoing monitoring of Puget Sound lowland streams and nearshore marine quality. | a | City of Auburn, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Renton, City of Seattle, City of Tukwila, King County, WSDOT | Annual payment to Ecology. |
|  | Stormwater Action Monitoring Effectiveness and Source Control studies | Participate and contribute funding to the pooled resources distributed by the Stormwater Action Monitoring group to research effectiveness of stormwater BMPs. | b | City of Auburn, City of Covington, City of Enumclaw, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of Seattle, City of Tukwila, Ecology, King County | Annual payment to Ecology. |
|  | Highway BMP Effectiveness Study | Compares pollutant removal effectiveness of a Vegetated Filter Strip and a Modified Vegetated Filter Strip. | b | WSDOT | Technological Evaluation Report expected 2020. |
|  | Facility BMP Effectiveness Study Compost Amended Biofiltration Swale (CABS) | To determine if a shorter than standard length biofiltration swale will meet infiltration and treatment goals. | b | WSDOT | Scheduled to being in May 2021. |

Goal 1∞ Objective 3


| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---------------------------|---|----------|----------|-----------------------------|
|  | Roadside Embankment Study | To characterize infiltration and hydrologic treatment (surface water flow reduction) that occurs along highway embankments. | b | WSDOT | Final report expected 2020. |



FIGURE 5: SOURCE CONTROL DETECTION DOG (PHOTO CREDIT: CITY OF SEATTLE)


Goal 1∞ Objective 4

Objective 4: Retrofit stormwater infrastructure to include or improve treatment.




Strategy a) Implement retrofits of existing development including roadway runoff systems and transportation infrastructure in order of agreed-upon priority.

Strategy b) Develop watershed-wide retrofitting needs on a watershed, basin and catchment level.







TABLE 7: GOAL 1 – OBJECTIVE 4

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|---|----------|----------------------|---|
|  | Retrofit program for existing stormwater facilities | Since 2014 Maple Valley has implemented a program to retrofit ponds and stormwater treatment facilities up to the design criteria (or near as possible within site constraints) of the current surface water design manual (now King County, 2016). The City will continue to prioritize and retrofit the facilities built prior to implementation of the 2009 King County Surface Water Design Manual or with identified design deficiencies annually. Input from OGD will be used to inform priority. | a | City of Maple Valley | Retrofit a minimum of 5 ponds annually from 2020 to 2025. |
| | | In accordance with the WSDOT NPDES Permit and Highway Runoff Manual (HRM) stand-alone (funded by the Legislature), project-triggered (done as required by the HRM), and opportunity-based (based on project funds) retrofit program. | | WSDOT | Ongoing- as required or as funding allows. |

Goal 1∞ Objective 4

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|--------------------------------|---|----------|------------------------------|--|
|  | Integrated Plan | City of Seattle developed an Integrated Plan as part of Wastewater Permit Compliance to identify and prioritize water quality improvement projects that result in the greatest environmental benefit. | a | City of Seattle | Implement three stormwater projects (Natural Drainage Systems Partnering, South Park Water Quality Facility, and Street Sweeping Expansion Arterials) by 2025. |
|  | SFAP grant funding | SFAP funds retrofits for municipal permittees and watershed-scale planning work associated with the Stormwater Management Action Planning (SMAP) requirement in the upcoming NDPES permit. | a, b | Ecology | Annual invitation of applications. Funding available is determined by the State Budget. |
|  | Structural Stormwater Controls | Implement a Structural Stormwater Control Program to prevent or reduce impacts to waters of the State caused by discharges from the MS4. | a | City of Seattle, King County | 300 program points by December 31, 2022. |
|  | Box of Rain | An effort to retrofit stormwater systems on elevated highways ('box of rain' is our working title for that project), using bioretention planters immediately below highway downspouts. | a | Stewardship Partners | Deploy a pilot installation of 10-20 bioretention planters under highway downspouts (pending funding and official DOT approval). |

Goal 1∞ Objective 4

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|--|--|----------|---|---|
|  | Georgetown Wet Weather Treatment Station | The Georgetown Wet Weather Treatment Station Project includes the construction of a CSO wet weather treatment station between the Brandon Street and South Michigan Street Regulator Stations, related pipes and a new outfall structure to release the treated water into the Duwamish River. When constructed, the station can treat up to 70 million gallons of combined rain and wastewater a day that would otherwise have discharged directly to the Duwamish without treatment during storm events. | a | King County | Completing Georgetown Wet Weather treatment station by the end of 2022. |
|  | Salmon Habitat Plan policy | Encourage retrofit of old, pre-surface water management program developments. | a, b | WRIA 9 | 10-year goal. |
|   | Stormwater Parks Guidance | Identify best practices for developing regional stormwater facilities that also provide recreational opportunities. | b | PSRC | Draft completed by 2022. Present to the Coalition during development and upon completion. |
|   | Stormwater Management Action Planning (SMAP) | Western Washington Phase II Municipal Stormwater Permittees are required to create an inventory of watersheds and catchments within their boundaries and use the inventory to prioritize basins and catchments for retrofit projects, land management/development strategies or stormwater management actions. A high priority catchment will be selected to develop a SMAP to identify actions to be taken. | b | City of Auburn, City of Burien, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of Tukwila | Catchment inventory completed by March 31, 2022, prioritization will be completed by June 30, 2022 and SMAP for a priority catchment will be completed by March 31, 2023. |

Recommendations for Goal 1

See Appendix B for a full list of the recommendations discussed for this goal.

The OGD group recognizes additional work must be completed to reach the Desired Future State for Goal 1 and recommends focusing future efforts on:

- Preventing toxins from coming into contact with stormwater, preventing toxins from being part of existing products (i.e. promoting safer “green” products); and removing toxins from stormwater through treatment BMPs, green infrastructure, and remediation.
- Implementing policies and regulations to reduce toxics from discharging to receiving waters. In addition, the enforcement of these policies and regulations should be supplemented with educational resources that are presented in an accessible way to communities.
- Utilizing science-based decision-making within the Watershed to maximize water quality benefits.
- Supporting community public-private partnerships to promote the implementation of green infrastructure.
- Encouraging regulators to improve the approval process for new BMP technology.
- Building out other metrics to track water quality, sediment quality, or beneficial uses. Data opportunities to consider include:
 - [King County source control and monitoring studies](#)
 - [Washington State Department of Ecology toxics monitoring](#)
 - [Recreation Data](#)
 - [The Environmental Information Management \(EIM\) database](#)
 - [Water quality atlas](#)
 - [Freshwater information network](#)



FIGURE 6: PUGET SOUNDKEEPER BOAT PATROL IN ELLIOT BAY
(PHOTO CREDIT: PUGET SOUNDKEEPER)

Goal 2: Foster partnerships, broad participation and collaboration amongst Watershed Partners and communities.

Problem Statement

Within the Watershed, there are actively engaged communities, jurisdictions, government agencies, nonprofits and businesses, who already work closely together on many stormwater issues. Addressing sources of pollution requires strong collaboration amongst industries and government agencies. Local jurisdictions have a history of successful and outcome-oriented collaboration through programs like Stormwater Outreach for Regional Municipalities (STORM) and the Stormwater Work Group (SWG). Continuing to build on partnerships like these can result in shared goals and prioritized actions to improve the management of stormwater runoff and boost outcomes for the community, people, and environment.

Desired Future State

OGD will be the primary source of information relating to stormwater management actions in the Watershed. Strong relationships and collaboration will help determine the highest priority actions to improve the Watershed, through adaptive, integrated watershed management.

Outcomes Metrics

The data sources in the table below can be used to establish a baseline and track metrics that can be updated every five years to direct adaptive management.

| Metric | Data Source |
|---|---------------------------|
| Number of organizations asking for support from OGD for grant proposals | Core Team |
| Funding acquired for partnering organizations | Core Team |
| Number of aligned programs that include Partners as participants | OGD Coordination Subgroup |

Goal 2 ∞ Objective 1

Goal 2 Planned Actions


Objective 1: Increase cross-sector and cross-jurisdictional partnerships and collaboration.

Strategy a) Coordinate aligned programs and projects to address common actions (salmon recovery, flood-risk, open space preservation).






Strategy b) Partner with and provide assistance to facilitate stormwater champions within industry.

Strategy c) Identify and invest in public/private partnership opportunities.



TABLE 8: GOAL 2 – OBJECTIVE 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|---|----------|---------------------------|--|
|  | Evaluate regional partnership engagement by the OGD coordination subgroup | Continue to evaluate engagement with regional partnerships. | a | OGD Coordination subgroup | Annually assess list of regional partnerships that the OGD coordination subgroup engages with. |




Goal 2 ∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|---|----------|---|--|
|  | Regional partnership engagement | Regularly engage with regional efforts within the Watershed that are working on programs aligned with OGD. These include, but are not limited to: Pollutant Loading Assessment, Green-the-Green Network, Duwamish Alive Coalition, UW Climate Impact Group, King County Pollution Identification and Correction Alliance, WRIA 9, Stormwater Outreach for Regional Municipalities (STORM), and Ecology's Watershed Restoration Enhancement Committee. | a | OGD Coordination Subgroup | Meet with identified regional programs at least semiannually to discuss shared goals, strategies, and opportunities for mutual benefits. |
|  | Duwamish Inspector's Group | Share information about stormwater management practices, challenges, and success stories from inspections at permitted facilities in the LDW Source Control areas. | a | City of Seattle, City of Tukwila, Ecology, EPA, King County | Participation in meetings leading to improved inspection quality and site prioritization. |
|  | PSRC Regional Open Space Conservation Plan | Work with jurisdictions to implement the Regional Open Space Conservation Plan, which identifies regionally important, multiple benefit conservation needs in King, Kitsap, Pierce, and Snohomish Counties. | a | City of Auburn, City of Kent, King County, PSRC | Consider and implement actions related to the Open Space Conservation Plan. |
|  | ROADMAP | Organized discussions specific to road maintenance and stormwater management. | a | King County | 4 meetings per year. |
|  | Phase I Permit Coordinator meeting | Organized discussions related to complying with the Phase I Municipal NPDES permit. | a | City of Seattle, King County | 4 meetings per year. |



Goal 2 ∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|---|----------|---|---|
|  | Western Washington Phase II Municipal Stormwater Permit Coordinator Group | Organized discussions related to complying with the Phase II Municipal NPDES permit. | a | City of Auburn, City of Black Diamond, City of Burien, City of Covington, City of Des Moines, City of Enumclaw, City of Federal Way, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of SeaTac, City of Tukwila, Ecology, King County | 6 meetings per year. |
|  | Water Resource Inventory Area 9 | Coordinated with shared interests in and responsibility for addressing long-term watershed planning for and conservation of the aquatic ecosystem and floodplain. | a | Boeing, City of Auburn, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of Seattle, City of Tukwila, Ecology, King County, UWFP | 4 Watershed Ecosystem Forum meetings per year; plan approval, 1 st quarter 2021. |

Goal 2 ∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|--|---|----------|-------------|--|
|  | Fish Passage Program – Stormwater Branch retrofit coordination | Working to align stormwater retrofit and fish passage projects by requiring new projects starting scoping in the 2019-2021 delivery plan that have a medium or high stormwater retrofit priority segment within ¼ mile of the project limits, and are not required to retrofit per the HRM (Highway Runoff Manual), to complete a stormwater retrofit assessment to determine if adding a stormwater retrofit to the project is feasible. | a | WSDOT | Starting July 2021 for fish barrier removal projects. |
|   | Fish Passage Program | Working to identify, classify, and prioritize the replacement of County-owned assets, including but not limited to culverts and piped stormwater systems that pose as barriers to fish passage. The prioritization of replacement for fish passage would be taken to consideration during other County replacement projects. | a | King County | Complete inventory of County-owned barriers by the end of 2020. Started removal of barriers in 2019. |

Goal 2 ∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|---|----------|-----------------------------------|--|
|  | Drainage System Analysis – Fish Passage Barriers | In 2019, City of Seattle completed a fish passage barrier analysis to create updated maps of fish passage barriers in City of Seattle’s GIS and updated the prioritized inventory of barriers as part of the Drainage System Analysis for the Integrated System Plan. | a | City of Seattle | <p>The following data gaps are being addressed to improve comprehensiveness and accuracy of Seattle’s fish passage barrier data:</p> <ul style="list-style-type: none"> • Ground truth existing data as needed. • Cross-reference fish passage barrier inventory with external agencies. • Reevaluate culverts and mainlines with unknown barrier status. • Assess status of culverts on creeks not included in original inventory. • Evaluate creeks with unknown stream typing. |
|  | Salmon-Safe Program | Incentive program for retrofitting agricultural land, and incentive for urban development / redevelopment to maximize stormwater treatment / management. | a | King County, Stewardship Partners | Have 10 properties, including urban campuses, golf courses, parks, and agricultural lands, certified “Salmon-Safe” by 2025. |

Goal 2 ∞ Objective 1



| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--------------------------------------|--|----------|---------------------------------|--|
|  | Sampling – Lost Urban Creeks Project | Collaboration between the City of Kent and Puget Soundkeeper’s Lost Urban Creeks project to grab water quality samples in urban streams. | b | City of Kent, Puget Soundkeeper | Report to be completed and assessment of additional streams to be analyzed by end of 2021. |
|  | Grant funding for Partners | Leverage Coalition resources, such as relationships, strategic planning, and organizational tools to seek additional funding for work towards completing this Implementation Plan. | c | Core Team | Support all grant applications that align with the Vision, Mission, and Goals of OGD. |



FIGURE 7: 2020 GREEN/DUWAMISH WATERSHED SYMPOSIUM (PHOTO CREDIT: DUWAMISH ALIVE)

Goal 2 ∞ Objective 2



Objective 2: Develop tools to increase collaboration amongst Partners.

Strategy a) Remove barriers to the public to inspire voluntary action of retrofitting and non-mandatory maintenance of existing stormwater infrastructure.




Strategy b) Incentivize participation in stormwater partnerships to improve Partner and public engagement across the Watershed.

Strategy c) Develop and support resident sampling and stewardship programs.





TABLE 9: GOAL 2 – OBJECTIVE 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|--|----------|----------------------|--|
|  | Private Stormwater Facility Inspection Program | In addition to conducting facility inspections under the operations and maintenance (O&M) section of the NPDES municipal permit, Kent will also inspect all businesses discharging to Kent's MS4. Technical assistance is provided during all of these inspections. | a | City of Kent | Inspect and educate at least 20% of businesses. |
|  | Private stormwater infrastructure maintenance | The City of Maple Valley will inspect all private stormwater facilities annually and recommend maintenance to property owners as needed. If maintenance is performed owners receive a 35% reduction in surface water management (SWM) fees (NPDES Phase II requirement). | a | City of Maple Valley | Provide 35% SWM fee reduction annually to property owners who perform required maintenance on their stormwater facilities beginning in 2021. |





Goal 2 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|--|----------|----------------------|--|
|  | Green Stormwater Infrastructure (GSI) incentive program | GSI program for unincorporated King County is in the pilot phase. The program will incentivize residential and commercial property owners to install rain gardens or cisterns, plant trees, or depave their property. | a | King County | Website finalized for incentive program by Q2 2021 with email sign up for more participants. Also have a community-led template from the Community-Led White Center GSI Strategy by Q2 2021. |
|  | GSI Mini Grants | Green Stormwater Infrastructure Mini Grants provide up to \$1,500 for homeowners and \$4,500 for income-qualified individuals and nonprofits within the King County Wastewater Treatment Division (WTD) service area that are not eligible for other incentive programs. | a | Stewardship Partners | 75% of money for the mini grants being awarded to income qualified individuals and nonprofits. |
|  | 12,000 Raingardens | Campaign to add more raingardens across Puget Sound, resources, and information available online. | a | Stewardship Partners | Being able to count the number of rain gardens in the Watershed. Sustained maintenance of the 12,000 Raingarden resource library. |

Goal 2 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|--|--|----------|---|--|
|  | STORM jurisdictions connecting on regional efforts | STORM members leverage resources to create regional messages and programs to promote awareness of stormwater issues and motivate public stormwater protective behavior. STORM members receive regular email updates where they can share resources, materials, and updates on stormwater projects. | b | City of Auburn, City of Black Diamond, City of Burien, City of Covington, City of Des Moines, City of Enumclaw, City of Federal Way, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of Seattle, City of SeaTac, Ecology, King County | Attend annual STORM conference. Resource Reservoir is continually updated and referred to jurisdictions for sharing of regional stormwater materials. Attend quarterly meetings. |
|  | Business Inspection Group | A collaboration of jurisdictions that provide support on source control inspection programs, as required by the MS4 Permit. | b | City of Auburn, City of Kent, City of Normandy Park, City of Renton, King County | Attend bi-monthly meetings. |
|   | City Habitats | Campaign to mimic natural conditions across our built environment to prevent polluted runoff from reaching Puget Sound. Share tools, create a practitioner network. A robust network of practitioners who are learning from each other and supporting each other. | b | Boeing, City of Seattle, DRCC, Duwamish Alive, Stewardship Partners, TNC, UWFP Washington Environmental Council | Property owners take action to improve permeability of rainwater on their property. Convening annual Green Infrastructure Summit to ensure that stormwater and green infrastructure best practices are widely shared. |

Goal 2 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|--------------------------------------|--|----------|---|--|
|  | Volunteer Lake Monitoring Program | The City of Maple Valley works with King County and local volunteers to perform monitoring of the 3 lakes within Maple Valley, Lake Wilderness, Lake Lucerne, and Pipe Lake. Volunteer monitors collect samples to measure secchi depth, water temperature, chlorophyll-a, phosphorus, nitrogen, and ratio of total nitrogen to total phosphorous. | c | City of Maple Valley, King County | Lake Lucerne and Pipe Lake is monitored monthly from May to November. Lake Wilderness is monitored once a month throughout the year. |
|  | Adopt a Drain Program | To increase the public's awareness of stormwater pollution issues, while providing an opportunity to get the public involved, City of Seattle is leading the effort to start up a regional Adopt A Drain program, where residents are asked to adopt a storm drain near their property and keep it free of leaves and trash. | c | City of Maple Valley | Establish the program in 2021, adopt out at least 500 storm drains annually throughout the region. |
|   | Volunteer Storm Drain Marker Program | Education and behavior change program for volunteers and residents to learn about stormwater and how they can prevent stormwater pollution. Volunteers mark drains with "Only Rain Down the Drain" and distribute door hangers. | c | City of Renton | Conduct 1 City-sponsored event with 20 volunteers. Increase participant awareness by 30%. |
| | | To increase the public's awareness of stormwater pollution issues, while providing an opportunity to get the public involved in mitigating these issues, the City operates a Catch Basin Marker Program. Volunteers mark storm drains with placards labeled "Don't Pollute, Drains to Habitat". | | City of Des Moines, City of Maple Valley, City of Renton, City of Seattle | Provide storm drain stenciling kits for volunteers to use upon request. |
| | | | | City of Normandy Park | Establish Catch Basin Marker Program by the end of 2021. Continue to post quarterly in the City of Normandy Park magazine about this catch basin marker program. |

Recommendations for Goal 2

See Appendix B for a full list of the recommendations discussed for this goal.

The Coalition recognizes additional work must be completed to reach the Desired Future State for Goal 2 and recommends focusing future efforts on strengthening partnerships both within the Coalition, and externally.

Internally, we can develop methods for prioritizing actions within the Watershed that encourages partnerships and emphasizes learning from each other.

Externally, we will focus coordination on continued integration with existing regional organizations and partnerships for better alignment and increased community input.

Across all partnerships, we will pursue watershed-wide engagement from the upper to lower Watershed over siloed jurisdictional investments and seek a balance between collaborating with existing efforts and trying out new approaches.



FIGURE 8: VOLUNTEERS FROM A VARIETY OF ORGANIZATIONS WORKING ON A RESTORATION PROJECT AT RIVERVIEW PARK IN KENT (PHOTO CREDIT: GREEN RIVER COALITION)

Goal 3: Increase access to existing data, research and resources.

Problem Statement

There is a wealth of existing stormwater management knowledge in the Watershed. The extent of this valuable knowledge is not easily accessible due to lack of a centralized location to hold this data, research and resources. Universal access to this knowledge base can help stormwater managers more effectively manage stormwater programs and projects. Creating a system, such as a clearinghouse for data and map information, can create greater efficiencies in decision-making and stormwater project lifecycle.

Desired Future State

OGD will provide an accessible and reliable hub for data and research to promote consistent and effective implementation of stormwater management with better informed decisions, outreach tools, and progress tracking systems.

Outcomes Metrics

The data sources in the table below can be used to establish a baseline and track metrics that can be updated every five years to direct adaptive management.

| Metric | Data Sources |
|---|---------------------------------------|
| Number of resources included in web-based Implementation Plan appendices | Appendices of the Implementation Plan |
| Number of users accessing the resources appendices of the web-based Implementation Plan | Core Team |
| Number of requests for information | Core Team |
| Number of responses to information requests delivered within 1 week | Core Team |

Goal 3 ∞ Objective 1

Goal 3 Planned Actions



Objective 1: Compile and centralize access to existing, available stormwater information.

Strategy a) Develop a map inventory of watershed assets, infrastructure specifications and resources.






Strategy b) Compile and apply national and state stormwater management research.

Strategy c) Utilize and leverage available information from existing organizations and programs.

TABLE 10: GOAL 3 – OBJECTIVE 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|-------------|---|----------|--|--|
|   | MS4 Mapping | Phase II NPDES Permittees maintain electronic maps with all known stormwater assets and surface waters. These maps are updated as new facilities are added, modified, or identified (NPDES Phase II Requirement). | a | City of Auburn, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton , City of Tukwila | Starting in 2020 the Permittees will verify the material and size of outfalls. By August 1, 2023 the City will complete mapping of connections from the MS4 to private stormwater systems. |
| | | Phase I NPDES permit mapping effort. | | City of Seattle, King County | Annual permit compliance with Mapping requirements. |
| | | WSDOT MS4 outfalls and BMPs are mapped in Phase I and II areas. Currently mapping complete conveyance in Phase I and II areas. Data is available to share externally. | | WSDOT | Outfall and BMP mapping complete. The required conveyance mapping pace is 79.5 centerline miles per year. |

Goal 3 ∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|-----------------------------|--|----------|----------------------|--|
|  | Asset Management Program | Inventory of public and private stormwater infrastructure and watershed assets. | a | King County | Annual update of asset inventory. |
|  | Update stream layer | Convert all mapping to the National Hydrography Dataset. | a | King County | Convert all mapping data to the National Hydrography Dataset by 2022. |
|  | Sound Impacts 2.0 | Puget Sound-wide impact metrics portal (www.soundimpacts.org). Tracks restoration and green infrastructure efforts across the region. Version 2.0 will include multiple benefit metrics and data quality improvements. | b | Stewardship Partners | Development and launch of Sound Impacts 2.0 to replace existing 1.05 version. Show the local and collective impact of the installation of green infrastructure throughout the Watershed. |
|  | WSDOT Research publications | WSDOT led stormwater research is available through WSDOT's Research Office: https://wsdot.wa.gov/Research/publications.htm . | b | WSDOT | Ongoing. Newly published studies posted for at least 2 years, older studies are listed and available upon request. |
|  | Stormwater Monitoring | WSDOT's Environmental Service Office (ESO) Stormwater Branch led research is available through WSDOT's ESO Stormwater Branch . WSDOT submits permit-required monitoring data to the International BMP Database . WSDOT submits data to Ecology's EIM database. | b | WSDOT | Ongoing. Data will be uploaded to EIM once the Technological Evaluation Report for the VFS/MVFS is published, expected in 2020. |

Goal 3 ∞ Objective 1



| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|--|----------|-----------|---|
|  | Compile information for the web based OGD Implementation Plan | Include links to information from existing organizations and programs organized into modular appendices for the web based OGD Implementation Plan. | c | Core Team | Include links in at least 4 modular appendices in an online format of the Implementation Plan by the end of 2021. |
|  | Stormwater Quality in Puget Sound | Report on impacts and solutions in reviewed literature. | b, c | TNC | Report currently dated 2018, a 2020 update is forthcoming in fall 2020. |



FIGURE 9: 12,000 RAINGARDEN VOLUNTEER WORK PARTY (PHOTO CREDIT: STEWARDSHIP PARTNERS)

Goal 3 ∞ Objective 2

Objective 2: Use existing information to prioritize actions regionally.

Strategy a) Consider results of effectiveness studies to inform cost effectiveness.



Strategy b) Ensure environmental justice communities are reflected in action prioritization in the Watershed.

Strategy c) Prioritize pollutant drivers.






Strategy d) Prioritize other stormwater improvements (e.g., maintenance, outfall retrofits, retrofit culverts).

Strategy e) Develop pollutant reduction metrics for maintenance and other operational actions to better understand and customize approaches.

TABLE 11: GOAL 3 – OBJECTIVE 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|---|----------|-------------|---|
|  | Water Quality Benefits Evaluation (WQBE) | King County is developing a cost-effectiveness optimization tool (SUSTAIN) through WQBE that would be available to help identify cost-effective actions across the Watershed. Phase 2 of development will build several maintenance and operational actions into the tool, so that they can be included in cost-effectiveness optimization evaluations. | a, e | King County | WQBE Phase 1 tools available in early 2021. WQBE Phase 2 tools available in 2022. |
|  | King County Equity and Social Justice (ESJ) Strategic Plan | King County's ESJ Strategic Plan outlines actions to advance environmental justice in the "Environment and Climate" section of the strategic plan. | b | King County | Articulate the ESJ impacts when making decisions about project or program implementation. |

Goal 3 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|---|----------|------------------------------|---|
|  | OGD Mapping Tool | Develop a geospatial mapping tool for guiding regional decision making related to stormwater management in the Green/Duwamish Watershed. | b, c, d | Mapping Subgroup | “Proof of concept” mapping tool by end of 2020. Tool that can support permittees with SMAP permit requirement by end of 2021. |
|  | Environmental Justice Task Force | WSDOT participates in the Environmental Justice Task Force responsible for recommending strategies for incorporating environmental justice principles into future State agency actions across Washington. This task force will meet over a 16-month period and will produce a final report due to the legislature and Governor by October 31, 2020. https://healthequity.wa.gov/TheCouncilsWork/EnvironmentalJusticeTaskForceInformation | b | WSDOT | Task Force report due October 31, 2020. |
|  | Pollution Identification Control program | An interagency program to prioritize sources of bacteria pollution in the Watershed. | c | King County | By end of 2020, select a basin to implement a PIC program. |
|  | Structural Stormwater Controls program | Prioritizes additional stormwater improvements and maintenance not captured Section S5.C.7 of the Phase I Municipal NPDES stormwater permit. | d | City of Seattle, King County | SSC science review and synthesis project report to Ecology on science-based understanding of BMP efficacy by August 2021. |
|  | WSDOT stormwater retrofit program | WSDOT prioritized existing highway segments for stormwater retrofit (to add treatment where it currently doesn't exist) as funding allows. | d | WSDOT | Ongoing. |

Goal 3 ∞ Objective 3



Objective 3: Develop prioritized list of capital infrastructure needs (based on agreed-upon priorities).

Strategy a) Develop a watershed-based list of sequenced capital retrofit needs (e.g., outfalls, culverts, and aging infrastructure).

Strategy b) Gap analysis of capital needs on a recurring schedule.

Strategy c) Establish a method of pooling funds to implement the most effective actions.

TABLE 12: GOAL 3 OBJECTIVE 3

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|-----------------------------------|---|----------|----------------|---|
|  | Stormwater Investment Plan | A plan describing and prioritizing stormwater work throughout King County. This plan will define how King County is planning to work with Partners to maximize regional capacity for managing stormwater. | b | King County | Create Stormwater Investment Plan by Q3 2021. |
|  | Surface Water Utility System Plan | A six-year planning guidance document including prioritized capital improvement projects. | b | City of Renton | Adopt plan and implement priority projects. Review capital needs every 6 years. |

Recommendations for Goal 3

See Appendix B for a full list of the recommendations discussed for this goal.

The Coalition recognizes additional work must be completed to reach the Desired Future State for Goal 3, and recommends focusing on improving the transparency, accessibility, and connectivity of existing systems and data. Providing credible information related to the science of managing stormwater, and the social demographics of our region will more accurately inform future decision making.

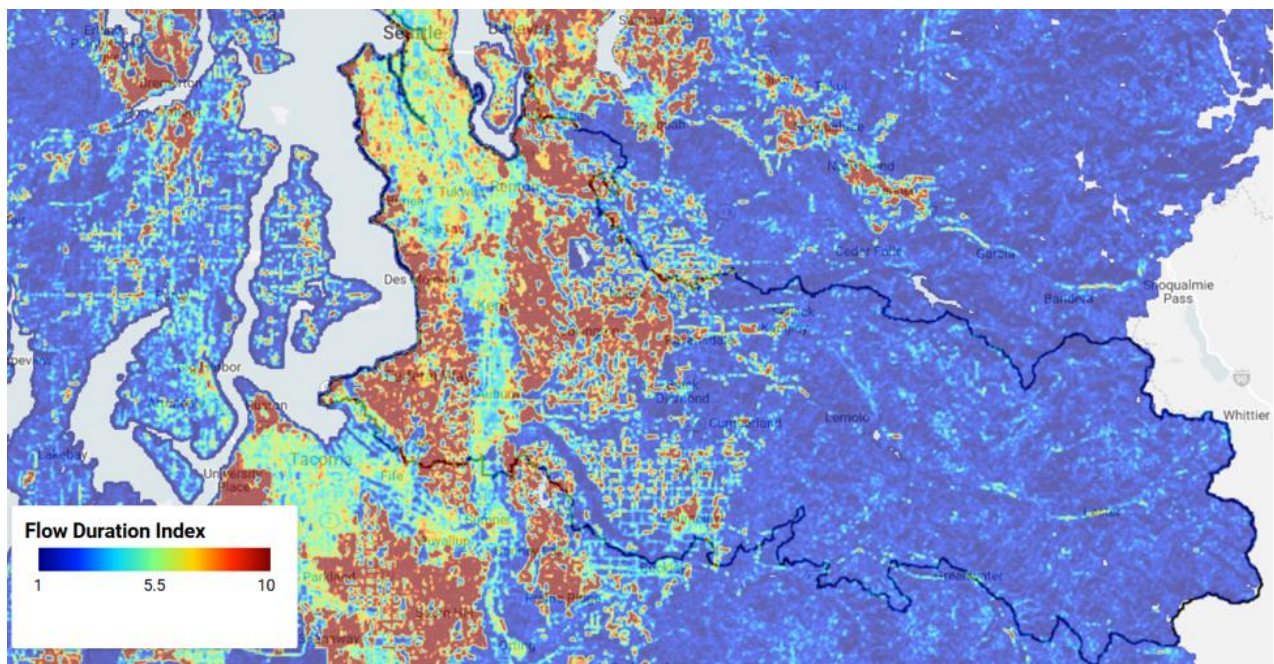


FIGURE 10: FLOW DURATION INDEX LAYER BEING USED TO BUILD THE OGD MAPPING TOOL (*PHOTO CREDIT: KING COUNTY*)

Goal 4: Restore natural hydrologic functions through reduction in uncontrolled stormwater runoff flows.

Problem Statement

Over several decades in the Watershed, stormwater runoff flow timing and quantity have been altered by land development and impervious surfaces. Much of this development occurred with inadequate or absent stormwater controls which has contributed to the degradation of our receiving waters. Altered flows result in flashy streams that cause erosion of stream channels, armoring of the streambeds, degraded fish and insect populations and impairs natural aquatic ecosystems. Strategies that retrofit areas without adequate flow controls, replace outdated infrastructure, improve infiltration, and manage stormwater flows help mitigate and restore the Watershed's natural hydrologic function, ultimately, benefiting the environment and human health.

Desired Future State

The Watershed will have a collaborative and adaptive approach to implementing a prioritized list of actions that restore natural hydrologic functions in ways that benefit the community, fish, and the environment.

Outcomes Metrics

The data sources in the table below can be used to establish a baseline and track metrics that can be updated every five years to direct adaptive management.

| Metric | Data Source |
|---|--|
| Reduction in high peak flows as reflected in flow duration curves | 1. United States Geological Survey 2. King County |
| Impervious surfaces in the Watershed | King County |
| Canopy cover in the Watershed | King County |

Goal 4 ∞ Objective 1

Goal 4 Planned Actions




Objective 1: Increase stormwater infiltration and permeability.

Strategy a) Improve technology related to and increase the appropriate use of permeable pavement, where feasible.





Strategy b) Increase use of Low Impact Development BMPs

Strategy c) Decrease impervious surfaces in the Watershed and preserve and increase permeable landscapes and parcels.

TABLE 13: GOAL 4 – OBJECTIVE 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|--|----------|--------------------------------|---|
|  | Residential Low Impact Development program | Requires use of low impact development (LID) technologies. Working to improve understanding and implementation of LID BMPs for new and re-development. | a, b, c | City of Kent | Pilot a single family home Low Impact Development inspection procedure. |
|  | Surface Water Design Manual | Require LID for applicable development projects where feasible. | b, c | City of Renton | Increase number of projects using Low Impact Development BMPs since requirement became effective in 2017. |
|  | Soos Creek TMDL | The plan will develop wasteload and load allocations to reduce stormwater impacts on benthic macroinvertebrates, an indicator of stream health. | b, c | Ecology | Reductions in high-pulse counts of storm events or in sediment erosion as a result of these events. |

Goal 4 ∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|--|----------|----------------------------|---|
|  | Surface water design manual updates | Kent Surface Water Design Manual requires use of LID technologies; including the option of preserving native vegetation and utilizing pervious pavements. | c | City of Kent | Continue refining techniques used to implement LID. Track at least one comprehensive pilot project. |
|  | Surface Water Management (SWM) Fee discount | Property owners may be eligible for a surface water management fee discount when managing runoff using approved flow control facilities, water quality facilities, features and/or BMPs. | c | King County | Annual assessment of all properties that requests a SWM Fee discount. |
| | | If maintenance is performed on private stormwater infiltration facilities annually, then owners will receive a 35% reduction in SWM fees. | b | City of Maple Valley | Annual maintenance of all participating infiltration facilities. |
|  | Land Conservation Initiative | Protect the remaining high conservation value lands and trail networks by 2050. | c | King County, the Coalition | 400 acres protected annually. |
|  | Conservation Futures | Advise on projects to implement salmon recovery plan. | c | UWFP, WRIA 9 | Annual advisement. |

Goal 4 ∞ Objective 2



FIGURE 11: BEFORE AND AFTER PHOTOS OF A RESIDENTIAL RAINGARDEN INSTALLATION (PHOTO CREDIT: STEWARDSHIP PARTNERS)



FIGURE 12: FLOODING IN THE GREEN RIVER VALLEY IN 2020 (PHOTO CREDIT: CITY OF KENT)

Goal 4 ∞ Objective 2

Objective 2: Ensure all properties have and maintain stormwater controls.

Strategy a) Work to redevelop and retrofit stormwater infrastructure and address nonconforming landscapes.



Strategy b) Retrofit under-functioning stormwater flow control and conveyance facilities.

Strategy c) Implement basin-level public retrofitting programs.





Strategy d) Conduct riparian tree planting and restoration.

Strategy e) Conduct maintenance to ensure long-term functionality of private and public infiltration BMPs (i.e., rain gardens).




TABLE 14: GOAL 4 – OBJECTIVE 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|------------------------------------|--|----------|----------------|---|
|  | Building Green Cities Guidance | Guidance for jurisdictions to develop incentive programs to encourage developers to go above and beyond in installing green stormwater infrastructure in their projects. | a | PSRC | Present guidance document materials to the Coalition. |
|  | Stormwater Facility Retrofit Study | Study to evaluate and prioritize projects to retrofit existing flow control stormwater facilities with water quality treatment. | a, c | City of Renton | Completed by 2022. |

Goal 4 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|---|----------|---|--|
|  | SMAP- Western Washington Phase II Municipal Stormwater Permittees | Each Permittee shall implement a Stormwater Planning program to inform and assist in the development of policies and strategies as water quality management tools to protect receiving waters. | c | City of Auburn, City of Black Diamond, City of Burien, City of Covington, City of Des Moines, City of Enumclaw, City of Federal Way, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of SeaTac, City of Tukwila | Receiving water assessment by March 31, 2022; prioritized and ranked list of receiving waters by June 30, 2022; Stormwater Management Action Plan for a single catchment area by March 31, 2023. |
|  | Re-Green the Green | The Re-Green the Green Riparian Revegetation Grant program supports projects designed to enhance riparian vegetation along the Green/Duwamish River and its tributaries within WRIA 9. | d | King County, WRIA 9 | A target of planting 2,384 acres by 2025. |
|  | Green River Temperature TMDL | Outlines a suite of strategies for implementation to reduce stream temperatures in the Green River during summer months. | d | Ecology | Ongoing. |
|  | Newaukum Creek Temperature TMDL | Describes the sources of stream temperature impairments and presents a strategy for implementation actions to restore the temperature to levels prescribed in Washington’s water quality standards. | d | Ecology | Water quality standards to be achieved by 2040. |

Goal 4 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|--|--|----------|--|---|
|  | Public flow control BMP operations and maintenance program | The inspection and required maintenance of all publicly owned and operated stormwater flow control BMPs/facilities that discharge to the MS4 (NPDES Phase I and Phase II requirement). | e | City of Auburn, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Renton, City of Seattle, City of Tukwila, King County | Annual inspections of all publicly owned flow control BMPs. |
|   | Private Maintenance and Stormwater Facility Inspections | The City of Maple Valley will inspect all private stormwater infiltration facilities annually and recommend maintenance to property owner as needed. | e | City of Maple Valley | Annual inspections of all private infiltration systems. |
| | | The inspection of private stormwater facilities to ensure they are functioning properly and are well maintained. | e | City of Seattle, King County | All residential facilities are inspected annually for the first 4 years and then every 3 years. Commercial facilities are inspected biannually, at a minimum. |

Goal 4 ∞ Objective 3



Objective 3: Perform watershed – level basin planning.

Strategy a) Analyze the basin by assessing current zoning and vested rights to determine where there might be insufficient stormwater infrastructure and most beneficial investment opportunities.






Strategy b) Continue to advance understanding of the impacts of restoring hydrologic functions.

Strategy c) Assess current conditions and capacity of current infrastructure and operational activities to determine shortfalls in flow control and water quality treatment needs.



TABLE 15: GOAL 4 – OBJECTIVE 3

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|---|----------|-------------|---|
|  | Community-Led White Center GSI Strategy | In-depth review of potential GSI projects in the White Center area to address community needs and wants as well as to better coordinate internal capital/infrastructure projects performed by other county divisions to incorporate GSI that meets the needs identified by the community. | a | King County | Completion of Community-Led White Center GSI Strategy by Q2 2021. |
|  | Fish Passage | WSDOT contracts with the WDFW to inventory, assess, and determine the amount of fish habitat blocked by fish passage barriers on state highways: https://www.wsdot.wa.gov/environment/technical/disciplines/stream-restoration/fish-passage-policies-and-procedures . | b | WSDOT | Ongoing. |






Goal 4 ∞ Objective 3

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|------------------------------------|--|----------|----------------|--|
|  | Fish Passage <i>(continued)</i> | Working to identify, classify, and prioritize the replacement of County-owned assets, including but not limited to culverts and piped stormwater systems that pose as barriers to fish passage. The prioritization of replacement for fish passage would be taken to consideration during other County replacement projects. | b | King County | Complete inventory of County-owned barriers by the end of 2020. Started removal of barriers in 2019. |
|  | Stormwater Investment Plan | A plan describing and prioritizing stormwater work throughout King County. This plan will define how King County is planning to work with Partners to maximize regional capacity for managing stormwater. | b | King County | Create Stormwater Investment Plan by Q3 2021. |
|  | Drainage Master Plan | Update drainage master plan. Will include capacity analysis and assess areas of deficient flow control and water quality treatment. | c | City of Kent | Update DMP by 2023. |
|  | Surface Water Utility System Plan | A six-year planning guidance document including prioritized flow control and water quality capital improvement projects. | c | City of Renton | Adopt plan and implement priority projects. Review capital needs every 6 years. |
|  | Drainage Master Plan | Update drainage master plan. Will include capacity analysis and assess areas of deficient flow control and water quality. | c | City of Auburn | Updated Drainage Master Plan by 2025. |

Goal 4 ∞ Objective 3

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|-------------------------------|--|----------|-----------------------|--|
|  | Stormwater Master Plan | Identify specific structural and non-structural solutions to provide adequate stormwater conveyance capacity and water quality treatment facilities to protect the environment and community. The plan will develop a long-range plan for construction of stormwater conveyance facilities within City rights-of-way. The plan will incorporate guidance for water quantity and quality control contained in the Washington State Department of Ecology's Stormwater Management Manual for Western Washington. | c | City of Normandy Park | Conveyance system field analysis to be completed by December 2020 and first draft of the report to be ready for Staff review by first quarter 2021. |
|  | Stormwater Comprehensive Plan | Creation of a Stormwater Comprehensive Plan, which prioritizes capital and retrofit projects within the City of Maple Valley. | c | City of Maple Valley | Report completed by 2022. |
| | | The City of Des Moines' Stormwater Comprehensive plan prioritizes capital and retrofit projects, determines rates for stormwater fees every 10 years, and tracks funding for NPDES requirements. | c | City of Des Moines | Review and update the 2015 Stormwater Comprehensive Plan by 2020. Create new Stormwater Comprehensive Plan every 10 years and update 5 years after each new plan creation. |
| | | City of Tukwila's Stormwater Comprehensive Plan prioritizes capital and retrofit programs and identifies fish passage issues. System and basin maps are also included. | c | City of Tukwila | Comprehensive Plan is updated every 7 years. Next update to begin in 2021. |

Goal 4 ∞ Objective 3

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|---|--|----------|--|---|
|   | SMAP- Western Washington Phase II Municipal Stormwater Permittees | Each Permittee shall implement a Stormwater Planning program to inform and assist in the development of policies and strategies as water quality management tools to protect receiving waters. | c | City of Auburn, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Renton, City of Tukwila | Working mapping tool by end of 2020. |
|  | Support SMAP development through mapping tool | The OGD mapping tool will support Western Washington Phase II Municipal Stormwater Permittees in some of the SMAP requirements and support regional prioritization. | c | OGD Mapping Subgroup | Working mapping tool by end of 2021. |
|  | King County Wastewater Treatment Division Long- Term Control Plan (LTCP) | Update modeling and planned control measures for CSOs. | c | King County | Planned LTCP update to be completed by 2025. |
|  | Soos Creek TMDL | The plan will develop wasteload and load allocations to reduce stormwater impacts on benthic macroinvertebrates, an indicator of stream health. | c | Ecology | EPA-approved TMDL by 2025. |

Recommendations for Goal 4

See Appendix B for a full list of the recommendations discussed for this goal.

The Coalition recognizes the need to focus efforts on a strategy that generates a fully vetted list of priority projects which are supportive of restored hydrologic function in the Watershed. The Partners want to emphasize key areas of coordination for the purpose of improving and accessing new opportunities to advance this goal, including but not limited to:

- Engaging with the Governor’s initiative on Riparian Habitat,
- Understanding the organizational impact of implementation,
- Ensuring public access is included in these strategies,
- Advancing the goal with conservation easements,
- Collaborating with the WRIA 9 habitat Plan, and
- Coordinating with large land owners like farmers, land conservancies, and warehouse owners, etc.



FIGURE 13: GREEN STORMWATER INFRASTRUCTURE IN THE DELRIDGE NEIGHBORHOOD (PHOTO CREDIT: CITY OF SEATTLE)

Goal 5: Increase innovation in stormwater management.

Problem Statement

Investments in research and innovation support increased effectiveness of stormwater management programs. Managing stormwater runoff is complex and requires a multitude of approaches and tools to adapt to a constantly changing landscape. The regional stormwater monitoring effectiveness studies and advancements in green chemistry are actions supporting innovation in stormwater management. Innovation can improve stormwater management by reducing sources of stormwater pollution, encouraging flexibility, and creating cost-effective strategies that align actions with desired environmental outcomes.

Desired Future State

The Watershed will have a culture of innovation that is data driven and promotes creative and dynamic solutions to proactive stormwater management practices.

Outcomes Metrics

The data sources in the table below can be used to establish a baseline and track metrics that can be updated every five years to direct adaptive management.

| Metric | Data Source |
|---|---------------------------------|
| Partners adapting existing incentive programs | The Coalition |
| Research project supported by the Coalition (funding, project management, or not participating using our language to get funding for) | The Coalition |
| Partner participation in research projects | The Coalition |
| Number of Technology Assessment Protocol- Ecology (TAPE) approved technologies | Ecology website |
| Innovations reported by Partners | The Coalition |
| Survey to Partners about the perception of the OGD 'culture of innovation' | The Coalition |

Goal 5 ∞ Objective 1

Goal 5 Planned Actions


Objective 1: Evaluate and implement incentive programs.

Strategy a) Identify and advance effective private incentive programs (e.g., Salmon Safe certification & Envirostars).

Strategy b) Expand government incentive programs (e.g. RainWise, stormwater facility credits) where the actions are not mandatory.

Strategy c) Promote project-level Low Impact Development to create awareness of its value.







TABLE 16: GOAL 5 – OBJECTIVE 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|-----------------------------|---|----------|------------------------------|---|
|  | Envirostars | The EnviroStars program provides environmental assistance and recognition for Washington businesses. Through the program, businesses can receive free technical assistance, connect with rebates and resources, and follow a clear path to sustainability. King County and the City of Seattle educate and incentivize businesses to participate in this environmental stewardship recognition program. | a | City of Seattle, King County | Assist all interested businesses in signing up for the Envirostars certification. |



Goal 5 ∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|---|----------|----------------------------------|---|
|  | Agricultural Water Quality BMP Cost Share Program | Cost share program for farm BMPs, such as manure management, roof runoff management, clean water diversion, heavy use area protection, and stream and wetland buffer fencing. The annual available budget is \$75,000. The program is match funding with a percentage reimbursed up to a cap. | a | King County | Provide match funding for roughly half a dozen water quality improvement/protection farm BMPs each year. |
|  | STORM GSI workgroup | This workgroup was created to consolidate information from existing regional incentive programs, including how the programs are developed and managed, how education and outreach is conducted, and other programmatic questions. The information collected by this subgroup will be shared with other regional jurisdictions and conservation districts interested in creating incentive programs or have existing programs. | a | City of Federal Way, King County | By April 2021, complete final report documenting interviews with jurisdictions and conservation districts with existing GSI incentive programs. |
|  | Equitable Green Infrastructure Incentives | Incentives to support voluntary adoption of green infrastructure focused mostly on voluntary retrofits and incentive programs that include the OGD geography: https://www.12000raingardens.org/gsi-mini-grants/ | a | Stewardship Partners | Reworking GI incentives to prioritize environmental justice in the funding structure. |
|  | RainWise Access Grants | This grant provides up to an additional \$1000 for RainWise eligible homeowners and non-profit community organizations (including religious groups) to bridge the gap between rebate amount and actual project costs for income limited and underserved communities. | a | Stewardship Partners | Awarding at least 5 RainWise Access Grants in the Watershed each year. |

Goal 5 ∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|---|----------|------------------------------|--|
|  | Trees for Seattle | Trees for Seattle targets residents with education and outreach on environmental stewardship, and actions and opportunities to implement BMPs related to landscaping and buffers. | b | City of Seattle | In 2020, Trees for Seattle will support residents in planting 1,000 trees and engage community members in caring for urban trees in 15-20 sites across the city. |
|  | GSI Incentive Program | The program will incentivize residential and commercial property owners to install rain gardens or cisterns, plant trees, or depave their property. | b | King County | Complete construction of two pilot projects by spring 2021 and a webpage created for the program by Q2 2021. |
|  | Ecology's Product Replacement Program | This state-wide program provides reimbursement funding, collection and disposal services, and other opportunities to help business owners transition to less toxic options. | b | Ecology | 90% response rate with the flame retardant survey that will be sent to 50 schools and businesses within WRIA 9. |
|  | | Inspect and assist businesses interested in participating in Ecology's Product Replacement Program. | b | King County | Assist businesses interested in Ecology's Product Replacement Program when assigned by Ecology staff. |
|  | WaterWorks Grants | King County WTD/s WaterWorks provides funding for projects that improve water quality in the service area for King County's regional wastewater system. | b | King County | Approximately \$2 million are awarded every two years. |
|  | RainWise | The RainWise program, a partnership between Seattle Public Utilities and King County Wastewater Treatment Division, provides incentives for private property owners to install small-scale GSI. | b | City of Seattle, King County | Manage 700 million gallons of polluted runoff per year with GSI by 2025. |

Goal 5 ∞ Objective 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|---|----------|---|---|
|  | King County Hazardous Waste Management Program Voucher Incentive Program | Eligible businesses can receive up to \$599 cash back for making site improvements that protect workers or the environment from hazardous product use, storage, or disposal. | b | King County | As needed. |
|  | Controlling Runoff from New Development and Redevelopment | Each Permittee shall implement and enforce a program to reduce pollutants in stormwater runoff to a regulated small MS4 from new development, redevelopment and construction site activities. The program shall apply to private and public development, including transportation projects. | c | City of Auburn, City of Black Diamond, City of Burien, City of Covington, City of Des Moines, City of Enumclaw, City of Federal Way, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of SeaTac, City of Tukwila | Annual compliance with Section S5.C.6 in the Phase II NPDES permit. |
| | | The SWMP shall include a program to prevent and control the impacts of runoff from new development, redevelopment, and construction activities. The program shall apply to private and public development, including transportation projects. | c | City of Seattle, King County | Annual compliance with Section S5.C.5 in the Phase I NPDES Permit. |

Goal 5 ∞ Objective 2

Objective 2: Increase research in key stormwater management areas.

Strategy a) Partner with educational institutions to conduct research.

Strategy b) Improve understanding of the effects of infiltration on groundwater quality and quantity and relation to surface water.

Strategy c) Research the use of restored riparian corridors as a stormwater treatment system.

Strategy d) Develop metrics for stormwater management programs such as:

Output metrics (e.g., assets mapped, studies conducted, agreements reached)




Outcome metrics (e.g., behavior change, public reached, water quality targets met).

Strategy e) Investigate the efficacy of regional facilities (i.e. mitigation banking, CASQA, basin treatment).






Strategy f) Quantify Low Impact Development benefits.

Strategy g) Pilot test innovative stormwater management technology.

TABLE 17: GOAL 5 – OBJECTIVE 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--------------------------|---|----------|--|--|
|  | Funding research on CABS | To evaluate the effectiveness of CABS at reducing toxicity to Coho and Zebra Fish. | a | WSDOT | Final report expected June 2020. |
|  | TAPE | Program to assess effectiveness of new technologies or specs modifications to existing BMPs used in stormwater treatment. | b | City of Seattle, Ecology, King County, WSDOT | Maintain a list of TAPE-approved technologies. |
|  | PIC Program | An interagency program to eliminate sources of bacteria in the Watershed. | d | King County | By end of 2020, apply PIC approach in one basin. |

Goal 5 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|---|--|----------|-------------|---|
|  | In lieu fee study | Researching alternative ways of treating stormwater. Flow control credit trading policy- allows new development to meet existing flow control requirements by trading the net difference. | e | King County | Study completed by 12/31/20. |
|  | Water quality credit trading | King County is conducting a feasibility study looking at the requirements needed for a fully functional nutrient credit trading program. | e | King County | Feasibility study completed by 2022. |
|  | WQBE | King County is developing a cost-effectiveness optimization tool (SUSTAIN) through WQBE that will be used in Phase 1 to evaluate the effectiveness of a County-wide GSI incentive program and regional facilities for stormwater volume and pollutant reduction. | e, f | King County | WQBE Phase 1 evaluation results will be made available to the public in early 2021. |
|  | Structural Stormwater Controls (S5.C.7) | Participating in a regional effort to understand the science and efficacy of structural stormwater controls on improving stormwater quality. | f | King County | SSC science review and synthesis project completed by August 2021. |
|  | Stormwater Technology Innovation | Through Tech Stars, supporting businesses that are innovating in the area of stormwater treatment. | g | TNC | Work is ongoing, likely annual opportunities for pilot studies. |

Goal 5 ∞ Objective 3

Objective 3: Support stormwater NPDES permit implementation.

Strategy a) Add NPDES permit coverage for secondary MS4 permittees (e.g. schools, ports, drainage districts).



Strategy b) Continue audits of effectiveness of NPDES stormwater permit for municipalities, transportation, industrial and construction sectors.

Strategy c) Address barriers to compliance through technical assistance.






Strategy d) Continue and increase implementation of NPDES activities.

Strategy e) Fully implement all stormwater permit requirements (Construction, Industrial, Secondary, City/County, WSDOT).

TABLE 18: GOAL 5 – OBJECTIVE 3

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|--|----------|-----------------|---|
|  | Secondary Permittee Technical Assistance | The Port of Seattle, University of Washington, and Seattle Public Schools are currently the entities in Seattle that have submitted notice of intent for coverage as a secondary Permittee under the 2019 NPDES Phase I Municipal Stormwater Permit. The City communicates with these entities about the control of pollutants, coordination of stormwater management activities for shared water bodies and provides technical assistance when requested. | a | City of Seattle | Continued coordination. |
|  | SAM effectiveness studies | Lead and partner on several SAM effectiveness studies. | b | King County | Submit at least one proposal in 5 years to advance work in the Watershed. |

Goal 5 ∞ Objective 3

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|---|----------|---------------------------------------|--|
|  | Structural Stormwater Controls (S5.C.7) | Implement a Structural Stormwater Control Program to prevent or reduce impacts to waters of the State caused by discharges from the MS4. | b | City of Seattle, King County | Technical memo on Structural Stormwater Controls Science Review and Synthesis project to be completed by August 2021. |
|  | Ad hoc Committee | Convene a multi-agency collective of Phase I and Phase II stormwater permittees, Non-profit advocacy groups, Department of Ecology, and the EPA to discuss and inform the evolution of the NPDES permits. | b | King County | Convene by the end of 2023. |
|  | Capacity grants | Noncompetitive funding made available for building regional stormwater management capacity. | c | Ecology | All capacity grant funds are dispersed to communities in the Watershed and used to build regional stormwater capacity. |
|  | Source control, pollution prevention assistance, control, and King County Hazardous Waste Management Program inspections | These inspections provide technical assistance to businesses to comply with required stormwater BMPs. | c | King County | Provide technical assistance to all businesses that request it. |
|  | Spill response visits, drainage complaints | Respond to water quality complaints and spills. | c | City of Seattle, Ecology, King County | Respond to all complaints within 24 hours. |

Goal 5 ∞ Objective 3




| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|------------------------------------|---|----------|---|--------------------------|
|  | Phase I NPDES Permit requirements | Comply with all requirements documented in the Phase I Municipal NPDES Stormwater Permit. | d, e | City of Seattle, King County | Submit an annual report. |
|  | Phase II NPDES Permit requirements | Implement programs to comply with the Phase II Municipal Stormwater Permit. | d, e | City of Auburn, City of Black Diamond, City of Burien, City of Covington, City of Des Moines, City of Enumclaw, City of Federal Way, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of SeaTac, City of Tukwila | Annual report submittal. |
|  | WSDOT NPDES Permit requirements | Implement programs to comply with WSDOT's NPDES Stormwater Permit. | d, e | WSDOT | Annual report submittal. |



FIGURE 14: A GREEN WALL IN SEATTLE'S GEORGETOWN NEIGHBORHOOD, HELPING TO CAPTURE POLLUTANTS AND RESTORE LOCAL HYDROLOGY (PHOTO CREDIT: DUWAMISH ALIVE)

Recommendations for Goal 5

See Appendix B for a full list of the recommendations discussed for this goal.

The Coalition recognizes additional work must be completed to reach the Desired Future State for Goal 5 and recommends focusing future efforts on building a culture of innovation by considering the entirety of the Watershed, connecting with cross-disciplinary partners, and promoting efforts with multiple benefits.



FIGURE 15: MITIGATION BANK TOUR (*PHOTO CREDIT: PUGET SOUNDKEEPER*)

Goal 6: Increase awareness and an understanding of stormwater management.

Problem Statement

Educating the public and other partners can help change behavior, improve compliance, implement programs and develop new funding sources to reduce stormwater pollution. In the Watershed and regionally, there are several stormwater education and outreach programs, coordinated through STORM, that help to increase awareness of stormwater runoff management and affect behavior change. Despite this, there is a need for additional effective education and outreach programs that are watershed-specific with unified, consistent and focused messaging geared towards a variety of audiences such as legislators, businesses, and the public.

Desired Future State

There is a systemic, proactive, and informed approach to stormwater management across institutions with a public that understands, advocates for, and pitches in for stormwater management.

Outcomes Metrics

The data sources in the table below can be used to establish a baseline and track metrics that can be updated every five years to direct adaptive management.

| Metric | Data Source |
|--|---|
| Public perceptions of stormwater issues | Kent and Tukwila survey results (2011) |
| Public perceptions of stormwater issues | STORM research report (2018) |
| Improved Behavior Change/Community Engagement | Existing baseline data survey data from STORM, Kent, and Tukwila (2011) |
| Improved participation in volunteer and stewardship programs | Partners |

Goal 6 ∞ Objective 1

Goal 6 Planned Actions

Objective 1: Research and carry out best methods for stormwater management messaging to target audiences.

Strategy a) Develop, test and implement effective stormwater messaging and delivery to diverse audiences.

Strategy b) Localize and deliver regional stormwater best management practice education and social marketing campaigns for target audiences.

Strategy c) Educate the public and legislators about economic and health benefits of stormwater management.



Strategy d) Develop an education campaign for land owners/land users about stormwater impacts of their actions and the benefits of stormwater management.

FIGURE 16: WATERSHED MODEL USED TO DEMONSTRATE THE EFFECT OF STORMWATER MANAGEMENT PRACTICES (PHOTO CREDIT: ECOSS)








Goal 6 ∞ Objective 1

TABLE 19: GOAL 6 – OBJECTIVE 1

| Action Table | Action | Brief description | Strategy | Partners | Target |
|--|-------------------------------------|--|----------|--|--|
|  | STORM regional campaign development | STORM researches effective stormwater messaging and helps jurisdictions deliver those messages to diverse audiences. STORM developed regional social marketing campaigns, such as Puget Sound Starts Here, Don't Drip and Drive, pet waste, and natural yard care campaigns. | a, b | City of Auburn, City of Black Diamond, City of Burien, City of Covington, City of Des Moines, City of Enumclaw, City of Federal Way, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of SeaTac, City of Seattle, City of Tukwila, Ecology, King County | STORM will create a new behavior change BMP program by 2022. |
|  | StormFest | StormFest is an interactive, stormwater science focused educational festival for 6 th grade students at Highline School District, focusing on experimental field lessons about local water quality and stormwater education that meet Washington State Common Core standards and Next Generation Science Standards. | a, b | City of Burien, City of Des Moines, City of Normandy Park, City of SeaTac, King County | Annually deliver StormFest program to 6 th graders in the Highline school district, either electronically or in person. |

Goal 6 ∞ Objective 1

| Action Table | Action | Brief description | Strategy | Partners | Target |
|--|---|--|----------|---|---|
|  | Regional campaign participation | Participate in active regional campaigns. | b | City of Seattle | Manage 17 pet waste baggie dispenser locations within the Duwamish River watershed. Partner with South Seattle Community College to offer 12 Don't Drip and Drive auto leaks workshops in 2020. |
|   | RainWise program | King County WTD and City of Seattle promote RainWise, a rebate program that helps eligible property owners manage stormwater by installing rain gardens and/or cisterns on private property. Promoting RainWise in eligible communities helps deliver stormwater management BMPs education to target audiences. | b | City of Seattle, King County | In 2020, Seattle will hold two RainWise workshops for contractors, conduct 12 workshops for private property owners, and perform Green Stormwater Infrastructure (GSI) outreach to at least 20 community-based events. |
|   | ECOSS Puget Sound Spill Kit Incentive Program | ECOSS delivers pollution prevention practice outreach and education to small businesses. ECOSS provides spill prevention and response support to small businesses without NPDES permits, including spill response training, spill plans, site maps, spill poster in social marketing format with end of year regionally based annual report. | b | City of Auburn, City of Black Diamond, City of Covington, City of Enumclaw, City of Kent, City of Maple Valley, City of Renton, City of SeaTac, City of Seattle, City of Tukwila, ECOSS | Provide spill kits, support materials and training in-language to all businesses found to be in need and choose to participate in the program. Typically in-person visits but ECOSS will have in-language video trainings available in 2020. 600 businesses visited annually. |

Goal 6 ∞ Objective 1


| Action Table | Action | Brief description | Strategy | Partners | Target |
|---|-----------------------------|---|----------|----------------|---|
|  | Storm Drain Marking Program | Education and behavior change program for volunteers and residents to learn about stormwater and how they can prevent stormwater pollution. Volunteers mark drains with “Only Rain Down the Drain” and distribute door hangers with tips to prevent stormwater pollution. | d | City of Renton | Conduct 1 City-sponsored event with 20 volunteers. Increase participant awareness by 30%. |



FIGURE 17: POOP TOSS GAME AT THE SNOHOMISH FARMERS MARKET (PHOTO CREDIT: ECOSS)

Goal 6 ∞ Objective 2



Objective 2: Expand stormwater management education, advocacy & training.

Strategy a) Develop a public education and advocacy campaign to support legislation and funding for stormwater actions.



Strategy b) Expand community and workforce stormwater management training (e.g., Dirt Corps) in part to increase innovation in stormwater management.

Strategy c) Conduct regional training for jurisdictions, developers, private owners and other partners about existing data, research and resources.




TABLE 20: GOAL 6 – OBJECTIVE 2

| Action Type | Action | Brief description | Strategy | Partners | Target | | | |
|---|--|---|----------|---|--|--|---|---|
|  | Urban Watershed School Program | Conducted via a partnership between City of Seattle, Seattle Parks and Seattle Public Schools and includes teacher training, stormwater lessons and materials, and an urban creek field trip program. The program is linked closely with school science curriculum and includes community service activities and lesson extensions that disseminate stormwater BMPs into the adult community. | b | City of Seattle | Outcomes are measured through teacher evaluations. | | | |
|  | Nature Vision K-12 Watershed and Ecosystem Education | Nature Vision partners with local jurisdictions, utilities, and stewards to provide in person training, and online resources tailored to K-12 students covering watersheds, ecosystems, invasive plants, etc. | b | <table border="1"> <tr> <td>City of Maple Valley</td> <td>The City of Maple Valley targets providing education to a minimum of 400 elementary school student annually.</td> </tr> <tr> <td>City of Auburn, City of Maple Valley, King County</td> <td>K-12 resource guides to be completed and used in the first quarter of 2021.</td> </tr> </table> | City of Maple Valley | The City of Maple Valley targets providing education to a minimum of 400 elementary school student annually. | City of Auburn, City of Maple Valley, King County | K-12 resource guides to be completed and used in the first quarter of 2021. |
| City of Maple Valley | The City of Maple Valley targets providing education to a minimum of 400 elementary school student annually. | | | | | | | |
| City of Auburn, City of Maple Valley, King County | K-12 resource guides to be completed and used in the first quarter of 2021. | | | | | | | |

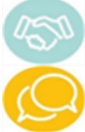

Goal 6 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|--|----------|-------------------|--|
|  | Citizen Science Programs | Annual salmon pre-spawn mortality surveys on Longfellow Creek. The goal of this program is to educate the community about salmon pre-spawn mortality and helping Washington State University continue their research. | b | Puget Soundkeeper | Complete annual survey and report. |
|  | Equinox “Industrial Strength” GSI demonstration site in Georgetown (South Seattle) | Hosted, self-guided and virtual tour of GSI demonstration site and BMPs, including Grattix boxes (rain gardens in boxes), oyster shell cisterns (downspout filters), cisterns, permeable pavers, water catchment systems, and vegetated walls. The project is on a non-permitted site, but many treatments could be implemented on an industrial site and used towards meeting permit requirements. ECOSS is looking for additional businesses interested in applying these techniques and can provide technical support and potentially GSI Mini Grant funding to support in the Watershed. | b | ECOSS | Over 1,000 people tour the demonstration site every year, either through hosted or self-guided tours, specifically business and large roof property owners. Creation of virtual tour video by the end of 2020. Monthly “Art Attack” events, hosted by Equinox Studios, to promote the GSI installations on their property. Interpretive signs installed at the site in 2020. Provide outreach to businesses or municipalities that want to replicate these BMPs at their site. |





Goal 6 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|--|--|---|----------|----------------------|--|
|   | Building Technical Assistance Capacity for Green Stormwater Infrastructure | Stewardship Partners will work with multiple partners to increase the professional knowledge base around Green Infrastructure by supporting existing training programs and sharing technical expertise. | c | Stewardship Partners | Work with partners to annually reach 100-300 individuals with resources, education and technical assistance. |
|  | Sustainable Landscaping Professional Development | These workshops address the following subjects: technical standards and implementation of stormwater codes, construction site erosion and sediment control plans and methods, long term site BMPs for soil preservation, and restoration specified in Seattle’s Stormwater Code and Manual. Workshops specifically target engineers, design professionals, landscape contractors (including Spanish-speakers), developers, builders, and land use planners. | c | City of Seattle | Work will continue in making core training available as recorded webinars for remote learning. |


Goal 6 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|--|----------|------------------------|--|
|  | Training or Workforce Development Programs | Existing training for RainWise/GSI contractors. | c | City of Seattle, ECOSS | RainWise contractor trainings offered two times a year, both online. Ongoing skill building workshops available throughout the year funded by SPU and King County WTD RainWise grants and contracts. Training program attendance and metrics on post-training job seeking. Assess the workforce needs in Stormwater Services – where are the jobs and what is the training needed. |
|  | RainWise Contractor Academy | 48 hours of free training to help contractors become an independent contractor for City of Seattle’s RainWise program. This 48-hour training is over 12 weeks and will be held remotely. | c | City of Seattle | In 2021, have a class of 20 made up of 50% BIPOC/Female/Non-binary/Veteran students, with the expectation that all will become RainWise contractors. |

Goal 6 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|---|----------|----------|---|
|   | Municipal Stormwater Training Program | <p>Modular trainings for municipal staff. There are nine different classes available. More than 1,200 municipal staff across the state have attended these trainings since they started in 2016. Nearly 50 jurisdictions have attended, including some secondary permittees.</p> <p>Developed statewide program to assist all municipalities with meeting O&M staff training per NPDES permit, including IDDE Inspections; Private/Public Infrastructure Inspection & Maintenance; LID Infrastructure Inspections & Maintenance; Spill Control & Response; Managing Industrial Stormwater General Permit; Public Works Erosion Control.</p> | c | ECOSS | <p>Expand marketing plan</p> <p>Make training more accessible and affordable.</p> <p>Provide at least 8 trainings per year with 20 people attending per class.</p> |
|   | Industrial Stormwater General Permit workshops | <p>Statewide program established in 2006, expanded in 2011. Modular trainings for permittees. Three main in-person workshops: (100) Permit Basics; (101) Fundamentals of SW Management; (201) Advanced SW Management – A Case Studies Approach. Created to help Industrial Stormwater General Permittees meet stormwater permit requirements.</p> | c | ECOSS | <p>Once in-person training is allowed, provide at least 6 trainings annually with 15 people attending per class.</p> <p>Expand marketing plan.</p> <p>Make training more accessible and affordable.</p> |

Goal 6 ∞ Objective 2

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|---|--|----------|---|---|
|  | <p>Certified Erosion and Sediment Control certification</p> | <p>Training program to ensure staff are certified to conduct erosion and sediment control inspections.</p> | <p>c</p> | <p>City of Auburn, City of Covington, City of Des Moines, City of Enumclaw, City of Kent, City of Maple Valley, City of Normandy Park, City of Renton, City of Seattle, City of Tukwila, King County, WSDOT</p> | <p>Each agency shall ensure that all staff whose primary job duties include controlling stormwater runoff from new development, redevelopment, and construction sites, are trained to conduct these activities.</p> |

Recommendations for Goal 6

See Appendix B for a full list of the recommendations discussed for this goal.

The Coalition recognizes additional work must be completed to reach the Desired Future State for Goal 6, and recommends focusing future efforts on:

- Utilizing community-based social marketing approaches to identify and equitably deliver and promote the most effective stormwater management messaging for the Watershed.
- Systematically providing resource support, including funding and content as needed, to community-based organizations to leverage their expertise in developing and distributing creative stormwater education throughout their communities to build grassroots stewardship.
- Integrating stormwater programming and messaging with other regional objectives and with the priorities and challenges facing community members in the Watershed.
- Implementing a regional campaign using plain language to coordinate messaging by multiple Partners. Increase educational campaigns within local schools.
- Encouraging increased collaboration between elected officials and Puget Sound Partnership boards and coordinating with them on OGD priorities.



FIGURE 18: DUWAMISH RIVER CLEANUP COALITION'S JAMES RASMUSSEN PREPARING PARTICIPANTS FOR AN EXCITING KAYAK TOUR OF THE LOWER DUWAMISH (PHOTO CREDIT: DUWAMISH ALIVE)

Goal 7: Build a coalition or collaborative entity to carry out the vision for the Green/Duwamish Watershed-Wide Stormwater Management Strategy.

Problem Statement

Successful watershed planning requires a framework, organization, and collaboration amongst different groups, along with a leadership group or authority who will be responsible for guiding the region in achieving the strategy. An organizational structure is critical to collaboratively implement the strategy in an efficient, credible, and cost-effective manner. Several models of watershed-scale coalitions or governance structures can provide direction for this watershed stormwater strategy such as Salmon Recovery Forums, Tualatin River Watershed-Clean Water Services and the Spokane River Regional Toxics Task Force.

Desired Future State

The Coalition is a sustainable, accountable team of organizations that leverage their best qualities to provide trusted recommendations to decision-makers for enduring stormwater management strategies in the Watershed.

Outcomes Metrics

The data sources in the table below can be used to establish a baseline and track metrics that can be updated every five years to direct adaptive management.

| Metric | Data Source |
|---|--------------------|
| Years with an active and signed charter | Our Green/Duwamish |
| Number of participating Partners and tenure | Our Green/Duwamish |
| Number of organizations that reference OGD goals, strategies, or recommendations in their own official planning documents | Our Green/Duwamish |

Goal 7 ∞ Objective 1

Goal 7 Planned Actions




Objective 1: Develop a strategy to build the Green/Duwamish stormwater management coalition or collaborative entity.

Strategy a) Identify example models of collaboration for stormwater management.

Strategy b) Work with Partners to identify successful representation of a coalition.

Strategy c) Identify roles and responsibilities of a coalition.

TABLE 21: GOAL 7 – OBJECTIVE 1

| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--------------------------------|---|----------|-------------|--|
|  | Host/attend Coalition Meetings | Participate in regularly scheduled Coalition meetings. | b | Partners | Participate or track the outcomes from a minimum of 5 Coalition meetings per year. |
|  | Convene the Coalition | Provide capacity and convening support to OGD initiative. | b | King County | Convene and support a minimum of 5 annual Coalition meetings with a minimum of 10 active participants. |
|  | Active subgroups | Task oriented subgroups focused on achieving short term, specific outcomes. | b | Partners | There are at least two active subgroups with members from at least three Partners. |

Goal 7 ∞ Objective 1



| Action Type | Action | Brief description | Strategy | Partners | Target |
|---|--|--|----------|-------------|---|
|  | Equity and Social Justice | Advance the goals of the King County Equity and Social Justice Strategic Plan through OGD efforts. | c | King County | Annually evaluate alignment between OGD actions and the King County Equity and Social Justice Strategic Plan. |
|  | Expectations for Partner participation | Use co-design approach to collaboratively create and ratify expectations for Partners to be active members of the Coalition. | c | Partners | 1 st draft of charter by April 2021. |



FIGURE 19: STORM DRAIN STENCIL (PHOTO CREDIT: KING COUNTY)

Recommendations for Goal 7

See Appendix B for a full list of the recommendations discussed for this goal.

The Coalition supports the existing organizational structure and is open to learning more about other watershed models. The group is also aware of a need to build in additional opportunities to gather community input and present as a more widely inclusive partnership, leading with equity and focused on trust and relationship building.



FIGURE 20: ELEMENTARY SCHOOL STUDENTS EXCITED ABOUT THEIR WORK ON THE SOOS CREEK TRAIL (PHOTO CREDIT: GREEN RIVER COALITION)

Prioritization of Future Actions

The prioritization of future actions should be guided by the vision of OGD and how to bring about the Desired Future States for the Watershed under each goal. Prioritization criteria may vary by action types, but some basic principles have already been established by the Coalition.

- The OGD mission (OGD 2017, See Guiding Statements) states that **actions with multiple benefits** should be prioritized. Actions that would benefit multiple OGD goals or goals of aligned programs (as identified by the Coordination Subgroup) should be prioritized.
- Actions that result in measurable water quality improvements should be prioritized.
- The overarching approach for OGD (OGD 2017, See Guiding Statements) is to use a **pro-equity approach** to select and implement stormwater actions. This means that equity and social justice (ESJ) should be imbedded in all prioritization criteria. Resources for this prioritization could include:
 - The equity areas identified by the [King County Land Conservation Initiative](#) related to health disparities and lack of access to open space,
 - Additional [census demographic data](#),
 - [The Environmental Health Disparities Map](#), and
 - Input from community-based organizations and the public.
- The **Desired Future States for each goal** should also inform prioritization by identifying actions that would be most effective at improving conditions towards those Desired Future States. For goals 1 (toxics) and 4 (hydrology), these are strongly related to **designated uses of water bodies** (e.g., swimming, fishing, spawning/rearing). Prioritization of these actions could be supported by some of the tools being developed as actions under Goal 3, such as:
 - The OGD mapping tool, which will use [The Nature Conservancy's Stormwater Heatmap](#) and other Geographic Information System (GIS) data layers to identify spatial priorities based on achieving conditions necessary for designated uses of water bodies (i.e., [SMAP NPDES Phase II Municipal Stormwater Permit requirement](#)), and
 - [King County's Water Quality Benefits Evaluation](#), which could help identify actions that may be most effective at improving conditions for ecological and human health endpoints related to designated uses of water bodies.

Adaptive Management

An adaptive management approach to this work was chosen to allow the Coalition to generate preliminary recommendations and demonstrate stormwater strategy implementation in the near-term, while providing opportunities to engage more Partners in a more inclusive process in the future. This adaptive management framework was developed by Williams and Brown (2014), building off of the work of

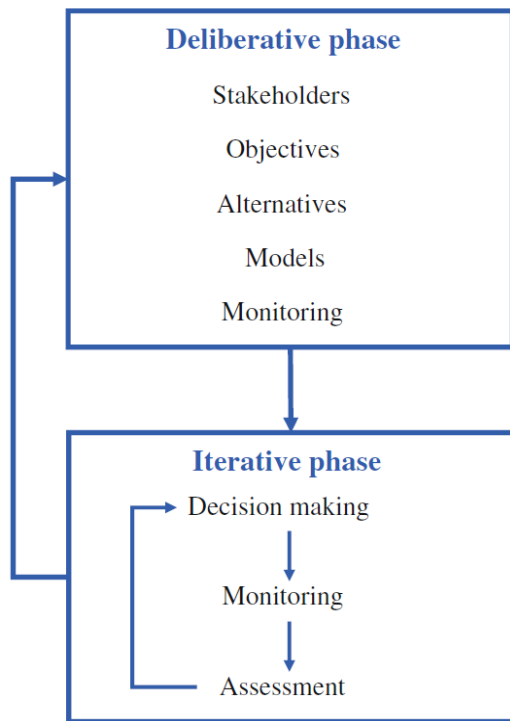


FIGURE 21: TWO-PHASE LEARNING ADAPTIVE MANAGEMENT. SOCIAL AND INSTITUTIONAL LEARNING INVOLVES PERIODIC RECONSIDERATION OF THE SET-UP ELEMENTS IN THE DELIBERATIVE PHASE (FROM WILLIAMS AND BROWN 2014).

many others. The framework establishes a feedback loop of action, assessment, and adaptation to address uncertainties and identify the current best courses of action. This structure allows the Coalition to learn from our work and continue to improve our actions with new information when it becomes available.

In creating the OGD Watershed-Wide Stormwater Management Strategy (OGD 2017), the Coalition went through a deliberative phase to establish Partners, objectives, and strategies towards Desired Future States in the Watershed (Fig. 22). This document has been the basis for this Implementation Plan, which will guide the next five-year period of collaborative OGD work. These decisions are documented in previous sections (Current Organizational Structure, Guiding Statements) of this plan. The Coalition has also established metrics and methods of assessment that will be used in adaptive management moving forward.

Annual Review

The Coalition will go through the iterative phase of our adaptive management plan every year. This phase involves technical learning about the Watershed based on management actions taken and is an opportunity to change course if new actions are required to meet objectives and goals. For each of the objectives and strategies under the goals, Partners have described actions they plan to take and set their

own targets for annual performance. Every year the Coalition will revisit these targets in a brief survey to Partners that will be reflected in our annual report. In compiling the annual report and planning for each following year, Partners will answer the following questions:

- Have the targets for your actions been met in the past year?
 - If yes, are there any changes that should be made to targets for the upcoming year? Are there opportunities to do more or do things differently?
 - If no, why not? Is an action no longer appropriate, or not feasible? What opportunities exist to address barriers?
- Should proposed actions change in coming year(s)?

Five-year Review

Every five years, the Coalition will revisit the deliberative phase of the adaptive management plan, which involves a review of who is involved and the organizational structure of the group, as well as a more extensive iterative phase. This is an opportunity for larger course corrections and to reconsider the more formative elements of the plan that the Coalition established in the inception of OGD. The Coalition will reassess the following and make plans to implement changes:

- Engagement
 - Who was missing from previous decision-making?
- Vision, mission, and goals
 - Do our vision and mission statements represent our current Partners?
 - Do our goals and Desired Future States still represent the direction the Coalition want to be headed?
- Uncertainties/data gaps
 - What uncertainties exist that prevent the Coalition from knowing the best course of action?
 - What can be done to address these uncertainties?
 - What metrics can the Coalition set up to check if our assumptions are correct and inform future review and adaptation?

Additionally, Partners will go through the annual review questions above for their planned actions and will also examine data on outcomes in the Watershed. Technical learning on a five-year timeline will involve reassessing the following and making plans to implement changes:

- Objectives, strategies, and actions

- Are stated objectives and strategies still the best route to our Desired Future States?
- Do current actions adequately address our objectives and strategies?
- What new actions should the Coalition add to our work plan, taking into consideration any unintended consequences, unsuccessful or inefficient actions, or new data?
- Metrics
 - Are outcome data trending in a positive direction?
 - Are Partners seeing the changes they would expect based on our actions?
 - Are there new metrics to track that would help the Coalition check assumptions or aid accountability?
 - Are there new targets the Coalition wants to set?

The answers to these questions will inform an update of the Implementation Plan, which will guide collaborative work during the following five-year period. In this way, the Coalition can adaptively manage the OGD work plan into the future.

Appendix A: Phase II Strategy Summary

Our Green/Duwamish Watershed-Wide Stormwater Strategy


Vision Statement

In the Green/Duwamish watershed, stormwater runoff is sustainably managed to support and enhance the environment, human health and the economy.

Mission Statement

We will improve and accelerate watershed-scale stormwater runoff management actions in the Green/Duwamish watershed, collaboratively, with community, jurisdictions, agencies, nonprofits and businesses. We will manage the quality and quantity of stormwater runoff by:

*preserving and restoring receiving waters * securing sustainable funding resources * aligning non-regulatory and regulatory interests * advancing equity, social justice and the economy * prioritizing actions with multiple benefits.

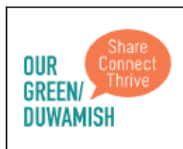
| | | | | | | | |
|--|--|---|---|---|--|--|--|
| <p>Goal 1: Reduce priority toxics and other pollutants discharging to receiving waters.</p> <p>Objective 1: Improve source control across multiple sectors (commercial, industrial, agriculture, residential).</p> <p>Objective 2: Increase and improve maintenance practices for stormwater infrastructure.</p> <p>Objective 3: Increase research on sources of priority toxics.</p> <p>Objective 4: Retrofit stormwater infrastructure to address flow control and water quality impacts.</p> | <p>Goal 2: Foster partnerships, broad participation and collaboration amongst watershed stakeholders and communities.</p> <p>Objective 1: Increase cross-sector and cross-jurisdictional partnerships and collaboration.</p> <p>Objective 2: Develop tools to increase collaboration amongst stakeholder.</p> | <p>Goal 3: Increase access to existing data, research and resources.</p> <p>Objective 1: Compile and centralize access to existing, available stormwater information.</p> <p>Objective 2: Use existing information to prioritize actions regionally.</p> <p>Objective 3: Develop prioritized list of capital infrastructure needs (based on agreed-upon priorities).</p> | <p>Goal 4: Restore natural hydrologic functions through reduction in uncontrolled stormwater runoff flows.</p> <p>Objective 1: Increase stormwater infiltration and permeability.</p> <p>Objective 2: Ensure all properties have and maintain stormwater controls.</p> <p>Objective 3: Perform watershed – level basin planning.</p> | <p>Goal 5: Increase innovation in stormwater runoff management.</p> <p>Objective 1: Evaluate and implement incentive programs.</p> <p>Objective 2: Increase research in key stormwater management areas.</p> <p>Objective 3: Support stormwater NPDES permit implementation.</p> | <p>Goal 6: Increase awareness and an understanding of stormwater runoff management.</p> <p>Objective 1: Research and carry out best methods for stormwater management messaging to target audiences.</p> <p>Objective 2: Expand stormwater management education, advocacy & training.</p> | <p>Goal 7: Build a coalition or collaborative entity to carry out the vision for the Green/Duwamish watershed wide stormwater management strategy.</p> <p>Objective 1: Develop a strategy to build the coalition or collaborative entity.</p> |  <p>HOW - Use a pro-equity approach to selecting and implementing stormwater actions</p> <p>WHAT – Build on current areas of stormwater management:</p> <ul style="list-style-type: none"> • Collaboration/Integration/Incentivization • Education • Enforcement/Compliance • Funding • Maintenance • Infrastructure • Policy • Research and innovation |
|--|--|---|---|---|--|--|--|

Next Steps

Recommendation 1: Build a coalition/organizing structure for watershed-wide stormwater management in the Green/Duwamish Watershed. This should include considerations for representation (who and the number of people engaged), a timeline for implementation, guidelines and purpose of coalition, roles and responsibilities. The information presented in this report provides the foundation for this work.

Recommendation 2: Develop a final Watershed-Wide Stormwater Strategy and associated implementation plan.

Recommendation 3: Identify and consider implementing early actions. Early actions are those that have the potential to be implemented quickly and already have some momentum in the watershed behind them. The project team should work with the coalition/organizing structure to identify the early actions that can be accomplished.



Appendix B: Full List of Unedited Recommended Actions by Goal

In June 2020, Partners completed a survey to solicit feedback on what additional work should be considered and how it should be prioritized. These ideas were consolidated and presented to the Partners at the September 2020 Coalition meeting where they were discussed and further developed in more detail. The notes from those discussions are included here.

The content of this Appendix is meant to provide the reader with the type of organizational transparency indicative of a truly collaborative process. As seen below, these types of brainstorming activities are a snapshot of our collective process. There may be spelling and grammar errors, acronyms that are not defined, and incomplete ideas. Some of the ideas listed below may even contradict each other. Some are very specific, others are more general, and all of them were helpful for producing a set of Recommendations at the end of each Goal chapter.

Goal 1 Recommendations:



Goal 1

DRAFT END PRODUCT:

The OGD group recognizes additional work must be completed to reach the Desired Future State for Goal 1 and recommends focusing future efforts on:

- Preventing toxins from coming into contact with stormwater, preventing toxins from being part of existing products (i.e. promoting safer "green" products); and removing toxins from stormwater through treatment BMPs, green infrastructure, and remediation.
- Implementing policies and regulations to reduce toxics from discharging to receiving waters need to be implemented more strictly. In addition, the enforcement of these policies and regulations need to be supplemented with educational resources that are presented in an accessible way to communities.
- Utilizing science-based decision-making within the watershed to maximize water quality benefits.
- Supporting community public-private partnerships to promote the implementation of green infrastructure.
- Encouraging regulators to improve the approval process for new BMP technology.
- Building out other metrics to track water quality, sediment quality, or beneficial uses. Data opportunities to consider include:
 - King County source control and monitoring studies
 - USGS toxics monitoring
 - Recreation Data
 - EIM
 - Water quality atlas
- Freshwater information network

Notes:

Organize pollution control into three categories:

1. source control (green products, pollution gen-activities)
2. treatment BMPs (retrofit and maintenance)
3. restoration and remediation (riparian, legacy load removals)

Control sources of pollution from building materials

Maintenance of existing facilities and new ones

Consumer education: e.g., tires to back up source-control policies

Better enforcement and application of regulations. Ex: pollution fine enforcement

Envirostars-help small businesses achieve green business status. Also, help in different languages to reach most small businesses

TAPE is expensive: improve it and create alternatives to it

Community public-private partnerships to implement SW retrofit GI strategies

Use science-based prioritization actions at the watershed scale to maximize WQ benefits (most bang for the buck)

Work with big box stores to carry products that present safer alternatives to products

Goal 2 Recommendations:



Goal 2

DRAFT END PRODUCT

The OGD stakeholder group recognizes additional work must be completed to reach the Desired Future State for Goal 2, and recommends focusing future efforts on strengthening partnerships both within the OGD coalition, and externally.

Internally, we can develop a method for prioritizing actions within the watershed that encourages partnerships and emphasizes learning from each other.

Externally, we will focus coordination on continued integration with existing regional organizations and partnerships for better alignment and increased community input.

Across all partnerships, we will pursue watershed-wide engagement from the upper to lower watershed over siloed jurisdictional investments, and seek a balance between collaborating with existing efforts and trying out new approaches.

NOTES

Does "internal" mean within OGD or within agencies/orgs? We should clarify this.

Participation has changed over time - we may want to clarify or formalize this.

Participation is different for different sectors, does it make sense to have different goals or recommendations for each? Or other ways that participants differ?

Goal seems specific to community outreach - previous convo on goal 7 might come into play here.

Great to have a working doc that gives us a big picture, standard op procedure for moving forward!

Partnerships with research groups - some overlap with goals 3 and 5 - how can we bring that into this goal to leverage those relationships? UW, WSU, SAM

Community engagement is important on a whole watershed scale - we need to keep that in mind and not only engage the LDW/Soos Creek.

Instead of these two buckets to house recommendations - each recommendation could be examined for what it looks like externally vs. internally.

Consensus can be a roadblock and may not be a good or realistic goal for us.

clarifying participation in OGD as a partner

miro

Goal 3 Recommendations:



DRAFT END PRODUCT

The OGD stakeholder group recognizes additional work must be completed to reach the Desired Future State for Goal 3, and recommends focusing on improving the transparency, accessibility and connectivity of existing systems and data. Providing credible information related to the science of managing stormwater, and the social demographics of our region will more accurately inform future decision making.

How do we ensure the quality of the data that's made available?

Idea: Data from Seattle to help inform decisions related to equity

NOTES

system needs to be transparent as possible. For the public as well as others who may want to take a look at the information.

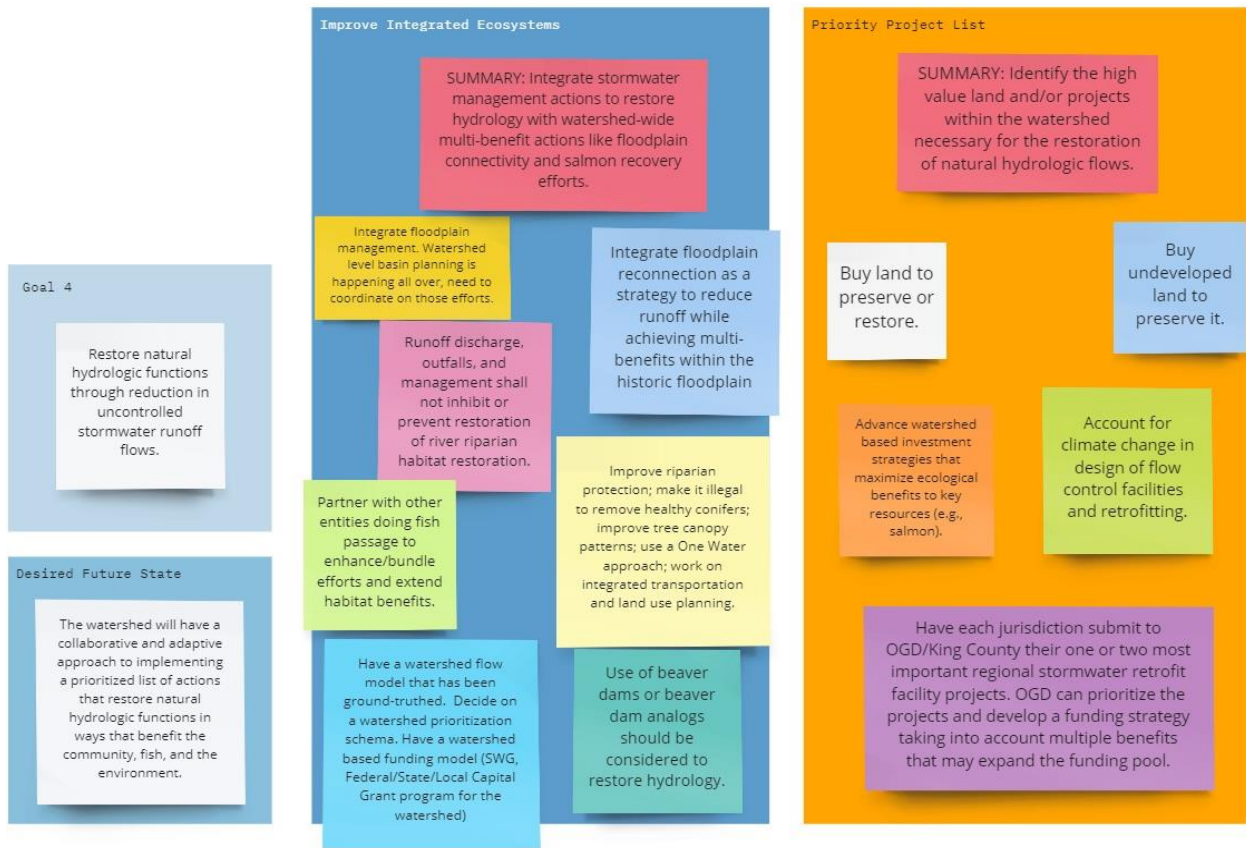
Accessibility, important information, linked to other mapping tools - revegetation map to help inform decision making

Health disparities map layer. Social elements are missing from existing data to help inform more comprehensive decision making.

miro



Goal 4 Recommendations:



Goal 4

DRAFT END PRODUCT:

The OGD partner group should focus efforts on a strategy to generate a fully vetted list of priority actions that support restored hydrologic function in the watershed. The OGD partners want to emphasize key areas of coordination for the purpose of improving and accessing new opportunities to advance this goal, including but not limited to:

- Engaging with The Governor's initiative on Riparian Habitat
- Understanding the organizational impact of implementation
- Ensuring public access is included in these strategies,
- Advancing the goal with conservation easements
- Collaborating with the WIRA 9 habitat Plan
- Coordinating with large land owners like farmers, land conservancies, and warehouse owners, etc..

#3

In the Stilly-SNO they prioritized actions near the mouth of the river, and input from farmers was key. Is that captured here, is that a part of the OGD process. Coordination with KCD board.

- Thinking about using SW management to get water to the streams, streamflow restoration through getting stormwater to streams during they time they need the flow.

#2 We should consider an action associated with the gov's initiative related to hydrologic function

On removal of conifers - does the coordination for doing these types of actions. we plan at a certain level that can be out of touch with implementation

Add - when we are doing this work public access should be considered for doing this work since it is their tax dollars, and increases positive community and health outcomes.

Add - conservation easements.

Potential additional layer to look at - WRIA 9 habitat plan.

Culverts should be considered to emphasize

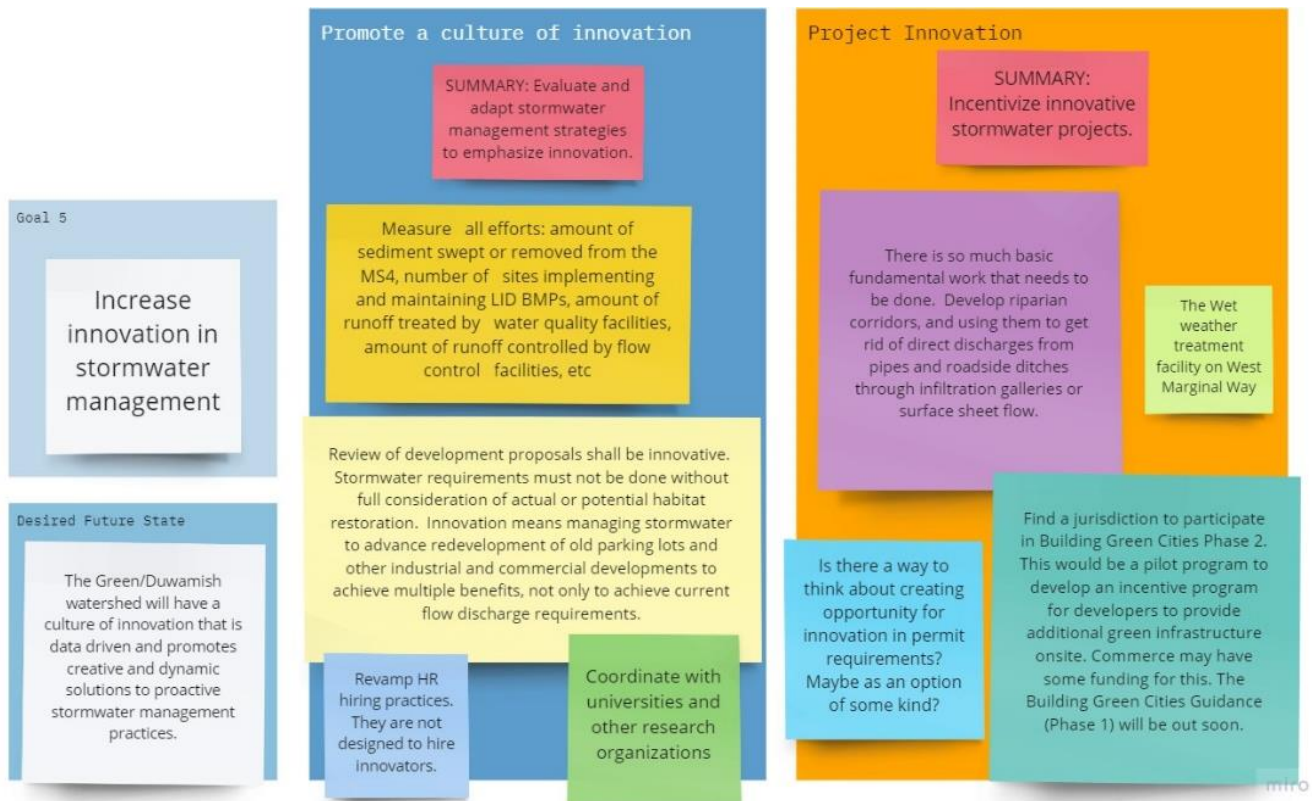
coordination to consider Gov's initiative on Riparian Habitat.

- Making sure these ideas have fully considered what implementation would look like for various organizations
- Making sure public access is included in these strategies,
- Looking to conservation easements to advance this goal,
- Coordination with the WIRA 9 habitat Plan,
- Better coordination with large land owners like farmers, and warehouse owners, etc..

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Share
Connect
Thrive

Goal 5 Recommendations:



Goal 6 Recommendations:



Goal 6

DRAFT END PRODUCT:

The OGD stakeholder group recognizes additional work must be completed to reach the desired future state for Goal 6, and recommends focusing future efforts on:

- Utilizing community-based social marketing approaches to identify and equitably deliver and promote the most effective stormwater management messaging for the watershed.

- Systematically providing resource support, including funding and content as needed, to community-based organizations to leverage their expertise in developing and distributing creative stormwater education throughout their communities to build grassroots stewardship.

- Integrating stormwater programming and messaging with other regional objectives and with the priorities and challenges facing community members in the watershed.

- Implementing a regional campaign using plain language to coordinate messaging by multiple partners. Increase educational campaigns within local schools.

- Encouraging increased collaboration between elected officials and Puget Sound Partnership boards and coordinating with them on OGD priorities.

NOTES

Missing: why are we doing this? What's the value for citizens and residents? How does stormwater management frame for people amidst all of the other priorities people face? How can we weave our work better into other important issues?

How do fines fit into this - as an educational tool? For example, businesses that get fined for improper dumping. How can punitive measure be combined with opportunities for education? Can we bring carrots and sticks together better?

These categories to separate recommendations are challenging and may not be helpful. We could just have the recommendations speak for themselves.

Social marketing is a behavior change approach, it may be too narrow for all of the outreach and education we want from this goal and the ideas shown.

We could have a separate section dealing with other methods of outreach and education

Goal 7 Recommendations:



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DRAFT END PRODUCT:
 The OGD stakeholder group supports the existing organizational structure. The group is also aware of a need to build in additional opportunities to gather community input and present as a more inclusive partnership through an effort focused on trust and relationship building. The group is also interested in learning from other watershed management models to continual develop and maintain the OGD coalition.

Community input is missing here.

Methodology on how input is requested - aware of communities of color, language, and cultural barriers.

Both of these are starting points to be integrated into the organizational structure

Building awareness for community feedback. This should be an inclusive effort to bring the communities voice to this process.

Gather more information.

miro

Appendix C: Additional Resources

| Partner | Resource Link | Description |
|---------------|---|--|
| STORM | https://www.pugetsoundstartshere.org/ | Puget Sound Starts Here is a regional campaign that raises awareness of personal actions that protect water quality in Puget Sound. |
| Ecology | https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Water-Quality-grants-and-loans | Stormwater Financial Assistance Program and Centennial grants: Funding for stormwater projects and activities that have proven effective at reducing impacts from existing infrastructure and development and enhance existing stormwater programs. Stormwater facility projects and a limited set of stormwater activities project types are eligible for SFAP funding. |
| WSDOT | https://www.nap.edu/author/NCHRP/transportation-research-board/national-cooperative-highway-research-program | WSDOT and NCHRP partnership research is available. |
| Many partners | https://ecology.wa.gov/Regulations-Permits/Reporting-requirements/Stormwater-monitoring/Stormwater-Action-Monitoring | Participate in and track studies funded by Stormwater Action Monitoring to inform stormwater management actions. |
| WSDOT | https://www.wsdot.wa.gov/environment/technical/disciplines/stream-restoration | This program is focused on restoring chronically degraded stream sections to promote fish passage. |
| WSDOT | https://wsdot.wa.gov/environment/technical/disciplines/cultural-resources | The Cultural Resources program works with federal and state agencies, tribal governments, the Washington State Historic Preservation Officer, and other interested parties to balance the state's transportation needs with protecting and preserving its cultural resources. |
| WSDOT | https://www.wsdot.wa.gov/environment/technical/disciplines/stream-restoration/ced-policies-procedures | In partnership with WDFW, Chronic Environmental Deficiency site restoration concentrates on long-term maintenance solutions that will optimize improvements for fish and fish habitat, while also addressing transportation needs. |
| WSDOT | http://pnsassociation.org/ | WSDOT is a key member of The Pacific Northwest Snowfighters (PNS), a group committed to improving winter maintenance practices and ensuring the best use of deicing products. They conduct deicer product research and host a snow and ice conference on a regular basis to share best practices and news from around the globe. |

Bibliography

OGD. 2016. "Our Green/Duwamish Preliminary Background Report."

OGD. 2017. "Our Green/Duwamish Watershed-Wide Stormwater Management Strategy Phase II Final Report."

Williams, Byron K., and Eleanor D. Brown. 2014. "Adaptive Management: From More Talk to Real Action." *Environmental Management* 53 (2): 465–79.
<https://doi.org/10.1007/s00267-013-0205-7>.