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DEPARTMENT OF PUBLIC WORKS
Design and Engineering

April 28, 2016

Municipal Permit Comments
Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Re: Stormwater Control Transfer Program: Second Draft, March 2016 Draft (Publication no. 15-10-017). "Building Cities in the Rain": 3-1-2016 Draft

As requested, I have reviewed the above related publications. This letter includes some general comments and suggestions on the proposed program as a whole. Additional comments specific to each draft document are included in the attached PDFs (Attachments 1 and 2).

Upon reviewing the draft documents, I find many of my earlier general comments and suggestions on the first draft of the Stormwater Control Transfer Program remain relevant and applicable to both current drafts. Rather than re-formulate those comments, I have elected to repeat those comments, for the most part, in this letter. This approach has the benefit of saving review effort to focus on providing specific comments in the body of each draft document (see Attachments 1 and 2), while also providing a simple, one-step review of my comments for Ecology and EPA staff.

STORMWATER CONTROL TRANSFER PROGRAM: GENERAL APPROACH

Rehabilitation of our watersheds and restoration of endangered species fish populations are matters of importance and urgency to Clark County. Ecology's continued effort to cost-effectively accelerate environmental improvements in highly disturbed sub-watersheds is greatly appreciated.

Ecology's flow control standard requires a new project to improve flow control *above that which currently exists*. I believe that this provides a clear opportunity for a flow control transfer program that can leverage existing public and private funding sources to significantly improve progress in watershed rehabilitation and related fish recovery. If Ecology's finalized flow control transfer criteria can assure that the associated offsite stormwater projects are well-considered and developed using a holistic watershed-based approach then a timely, defensible, effective and cost-effective watershed restoration program should result.

With such a program clearly being mutually beneficial to all parties, Ecology's primary objective then becomes one of making the program as attractive as possible to potential participants so

that this voluntary watershed rehabilitation effort achieves as wide a participation as possible. This can be achieved by minimizing the effort and costs associated with developing a flow control transfer proposal in a variety of ways. Suggestions are noted below, and in the comments in Attachments 1 and 2.

This review has been completed with this basic understanding of the proposed program in view.

COMMENTS AND SUGGESTIONS

To be successful, the strategy will need to be ***effective, cost-effective, legally defensible***, and ***attractive to participants***.

1. By essentially constructing two needed and effective projects rather than one, the strategy will be ***effective***, as long as good project selection criteria are used.

2. For similar reasons, the strategy will also be ***cost-effective*** watershed rehabilitation. Additionally, stormwater projects typically come with additional environmental benefits other than flow control or water quality treatment, also adding to their cost-effectiveness (from a watershed standpoint). Still further, the project will also provide the same economic and cost effectiveness benefits as other proven strategies, such as wetland banking, that other environmental agencies have used successfully.

3. By providing full water quality treatment and flow control to the Existing Condition there will be no impacts at the project site and so the strategy will be ***legally defensible.*** However:

    - It is important that a single measure, such as a WWHM Flow-Duration analysis, is used to determine "no impact" at the project site, and that that single measure suffices for all agencies charged with reviewing projects. Uncertainty in obtaining all the necessary approvals for a project may cause potential partners to abandon flow control transfer proposals, potentially after having expended a great amount of time and funds.

    - Note that a very similar proposal for off-site stormwater mitigation was attempted by Clark County and was successfully challenged at the Pollution Control Hearings Board level. The essential flow control transfer component of Ecology's current proposal should be checked with the Board and legal staff to assure that a similar outcome will not occur with this new Ecology initiative. (Note: As background, Attachment 3 provides some supporting information that was developed for the county's previous proposal).

4. With this proposed strategy, Ecology essentially shifts from performing a purely regulatory function into becoming a more active partner in watershed restoration efforts. If Ecology is to be successful in this new role, the program will need to be ***attractive to participants.*** Following are some considerations that may help Ecology attract partners and funds for the hoped-for watershed improvements:

    - The "onsite-plus-offsite" stormwater mitigation alternative will need to be cheaper than the standard "onsite mitigation-only" alternative.

- The program should facilitate simple proposals from the permittee that can be completed in a timely manner without relying on the completion of elaborate, long-duration studies or similar.

- The proposal should not require an excessive amount of additional analysis beyond that currently required for a standard design.

- A high degree of certainty in receiving approvals, from all approving agencies, is needed. Ecology will need to continue to work carefully on the draft language and with other agencies to accomplish this.

- Good assurance of approval needs to be established early in the proposal process.

- The program should acknowledge and make allowances for the additional responsibilities, such as drainage and flood control, of Ecology's partnering agencies. The environmental improvements should not come at the risk of flooding of upstream or downstream roadways and homes. In this regard, we have found at Clark County that it is best to have totally separate "Hydrologic Accounting" modeling (i.e. computation of "stormwater credits" using a hypothetical upstream basin) and "Final Hydrologic and Hydraulic modeling" (using the actual upstream basin; may include additional required single-event hydrologic modeling). The physical flow control structures need to be designed to achieve the multiple hydraulic control needs of the project and its actual upstream tributary basin, rather than the simple, single-purpose flow control structure developed from a single "flow control credit" WWHM hydrologic run using a hypothetical upstream basin.

- The program should not require unnecessary and unduly burdensome post-project requirements, e.g. performance monitoring. However, the effectiveness of the program in attracting proposals from permittees, and in constructing watershed improvement projects *is* worth monitoring to identify potential future program improvements (incentives, multi-benefit opportunities, etc.)

More specific comments related to each of the above items are included in Attachments 1 and 2.

FUTURE CONSIDERATIONS

Although it is an excellent step forward in leveraging funds for watershed rehabilitation, the flow control transfer program in its present form does not yet appear sufficiently flexible to be able to encourage and facilitate several important watershed improvement project types. Examples of needed and effective project types that remain underfunded but that may be critical to effective watershed restoration and watershed sustainability include:

- A headwater restoration project that provides valuable flow control for the downstream channel while also providing important groundwater recharge and wetland restoration

- A stream stabilization project, such as a channel log jam, that provides useful flow control by raising the stream bed and so reconnecting the incised stream to its

floodplain. However, the project's additional value in reducing ongoing stream erosion and re-establishing natural groundwater elevations in upstream reaches may potentially be even more valuable to watershed restoration efforts.

It does not appear that either of these multi-benefit watershed restoration project types would qualify as a flow control transfer project under the current draft of the flow control transfer regulations. I encourage Ecology and EPA to continue to look for ways to "leverage" existing stormwater regulations, programs and funding to allow important watershed rehabilitation projects such as those listed above to be completed. Two options worth considering might be:

- providing increased flexibility for public agencies to propose alternative flow control transfer project types for public road projects as part of their NPDES permit requirements, perhaps for a limited permit period, and
- Further development and expansion of the current Ecology/WSDOT "Demonstrative Approach" program and criteria to include a wider range of project types.

In summary, I believe this is an excellent initiative from Ecology and EPA that could potentially be highly effective in helping "jump start" watershed restoration and endangered fish recovery efforts that have stalled due to a lack of reliable funding. Ecology's Western Washington Retrofit Grant Program, and WSDOT/Ecology's DAT approach, show similar promise in this regard. Ecology and EPA are to be commended for taking this new active approach and moving us forward towards watershed restoration and sustainability.

Yours Sincerely,

John Milne

John Milne, P.E.

CC: Ken Lader, John Davis, Mike Soliwoda, Jeff Kostechka

im review 4-7-16

DEPARTMENT OF ECOLOGY
State of Washington

Stormwater Control Transfer Program

Out of the Basin

SECOND DRAFT

March 2016
Publication no. 15-10-017

Publication and Contact Information

This document is available on the Department of Ecology's website at https://fortress.wa.gov/ecy/publications/SummaryPages/1510017.html

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To request ADA accommodation including materials in a format for the visually impaired, call the Water Quality Program at 360-407-6600. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

Stormwater Control Transfer Program

Out of the Basin

by
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Table of Contents

Acknowledgements

This page will be completed after the Public Comment period.

The authors of this guidance would like to thank the following people for their contribution:

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Abstract

This document describes an alternative program that Phase I and Western Washington Phase II Municipal Stormwater Permittees can implement to fully satisfy permit requirements associated with flow control (Appendix 1, Minimum Requirement #7) as it is triggered at new and redevelopment sites. The goal of this innovative stormwater management approach is to direct stormwater management efforts to watersheds where reducing high stream flows is more likely to contribute to maintaining or restoring designated and existing beneficial uses. The report describes key elements of an approvable program, including stormwater control transfer opportunities, watershed prioritization principles and data needs, allowable types and credit capacities of regional facilities, program tracking tools, and evaluation techniques.

I. Key Features of Programs to Transfer Stormwater Controls to Priority Watersheds in Western Washington State[1]

Guidance Overview

This document lays out features of an alternative program (a Stormwater Control Transfer Program) that Western Washington State municipal stormwater Permittees (Permittees) can implement to satisfy permit requirements associated with flow control - Minimum Requirement #7 – when it is triggered at new and redevelopment sites. This stormwater management approach directs stormwater control efforts (e.g., flow control facility upgrades or installation) from the Project to other high priority watersheds within a jurisdiction. The determination of the priority of watersheds for this program is discussed within this document. High priority watersheds are more likely to contribute to maintaining or restoring designated and existing beneficial uses. This program cannot serve to meet municipal Permittees' obligation to implement a structural retrofit program as currently required by Special Condition S5.C.6 of the Phase I permit. That said, a Permittee may use a priority ranking system similar to the one described within this document to direct its structural retrofit program. Furthermore, this guidance does not restrict a municipality from also using its structural retrofit program to accelerate improvements in high priority watersheds.

Permittees establishing a Stormwater Control Transfer Program that includes out-of-basin transfers must seek input from local tribes and state and federal natural resource agencies, and must obtain written Department of Ecology (Ecology) approval [2] of their alternative program as required by Special Conditions S5.C.5.a.i. of the Phase I Permit or S5.C.4.a.i. of the Phase II Permit. Ecology strongly recommends that the jurisdiction(s) intending to implement such a plan adopt it locally through a public process.

The focus of the body of this document is out-of-basin transfers. Attachment 1 of this document provides a summary of requirements and guidance for in-basin transfers of stormwater facilities. In-basin transfers refer to the construction of stormwater facilities that discharge to the same receiving water as the development project site.

[1] These guidelines apply to Permittees covered under Phase I and Western Washington Phase II Municipal Stormwater Permits. Many aspects of these guidelines are applicable to Stormwater Control Transfer Programs that incorporate fee-in-lieu features.

[2] For the 2013-18 permit cycle, Ecology intends to use its Administrative Order authority to approve individual Permittee proposals to establish a Stormwater Control Transfer Program. Actions taken though Administrative Orders are appealable by municipalities and third parties. Any parties interested in being notified of Administrative Orders approving transfer programs can contact Ecology to be added to a notification list.

Problem Statement

In the Puget Sound region, the predicted annual rate of new and redevelopment is 1.6 percent[3]. At this pace, it will take 60+ years to install or upgrade stormwater facilities to a level comparable to the current NPDES Municipal Stormwater New and redevelopment standards across the Puget Sound region. Elsewhere in western Washington, new and redevelopment rates are lower, meaning that it may take significantly longer. Regardless, patterns of redevelopment are based on market forces and not on the stormwater management needs nor the environmental value or priority those watersheds represent. A Stormwater Control Transfer Program allows a Permittee to transfer some stormwater improvements from the site-by-site approach of upgrading flow control facilites to high priority watersheds. This allows investments to focus where stormwater control facility upgrades/installations (in this case, flow control improvements) will provide a more immediate benefit to waterbodies showing environmental stress associated with stormwater impacts.

How to Use this Guidance

This guidance document contains four sections, each of which provides information that will be useful to establish an approvable Stormwater Control Transfer Program in Washington state. The first section of the guidance (**Key Features**) provides a description of the overall program, including general guiding principles, key elements, and opportunities/limitations on the transfer of flow control improvements to a site in a different watershed. The next section (**Watershed Prioritization**) describes the types of data or information that can inform watershed prioritization as well as several principles that must be considered during that prioritization process. The third section (**Effectiveness Monitoring**) proposes how a monitoring effort can be designed and implemented to document the effectiveness of improvements made in high priority watersheds. Finally, the fourth section of the guidance (**Stormwater Facility Transfer Capacity Credits and Tracking**) lays out an accounting program that can be established to track stormwater control transfers on an area basis.

This document does not provide exhaustive and detailed instructions on how to set-up and implement a Stormwater Control Transfer Program. It likewise does not provide direction on siting individual facilities within a high priority watershed. Rather, this guidance is intended to inform Permittees considering this approach and to provide general guidance and principles when developing a Stormwater Control Transfer Program focused on flow control. This guidance is based on Ecology's experience in reviewing and approving alternative programs on a case-by-case basis, and may evolve as issues or nuances are raised and better understood. Permittees exploring this alternative approach to meet permit requirements are encouraged to contact Ecology early in the planning stage.

[3] Analysis of Stormwater Mitigation Projected to be Constructed by 2040 as Part of New and Redevelopment in WRIA 9, King County, 2014.

General Stormwater Flow Control Transfer Program Principles

1. Environmental goal = Reduce the duration and frequency of high stream flows that are incompatible with protection/restoration of designated[4] and existing[5] uses.
2. A Stormwater Control Transfer Program must accelerate hydrologic improvements in high priority watersheds.
3. Transferring stormwater flow control away from a project site cannot result in increasing the pre-project flow duration within the Flow Control Standard Range to any receiving water.
4. Projects triggering MR #7 and located within a high priority watershed cannot transfer flow control improvements to another watershed.
5. A municipality must evaluate its watersheds and establish a science-based prioritization scheme prior to implementing a Stormwater Control Transfer Program.
6. Ecology approval of a Stormwater Control Transfer Plan does not shield the Permittee from additional or more stringent requirements associated with Total Maximum Daily Loads, S4.F.3 adaptive management plans, future stormwater requirements, or other enforceable mechanisms.

Key Stormwater Control Transfer Program Elements

1. For *replaced and new surfaces*, flow control improvements may be transferred to a high priority watershed.[6] For purposes of this guidance, flow control "improvement transfers" to high priority watersheds are allowed or restricted in the following manner:

   MR #7 Flow Control requires that qualifying projects control flow durations (for the Flow Control Standard Range of pre-developed discharge flow rates from 50% of the 2-year peak flow rate up to the full 50-year peak flow rate) to match those conditions produced by the *pre-developed* land cover condition (generally, forested) rather than by the immediate *pre-project* land cover condition. *In the flow control transfer scenario, the project provides flow control to match the pre-project conditions at the project site. The project then transfers the flow control improvement requirement (match the pre-project land cover to the pre-developed land cover condition) to a high priority watershed.*
2. In accordance with S5.C.9.b. of the Phase I Permit, and S5.C.4.c. of the Phase II Permit, Permittees must verify the long-term operation and maintenance of those offsite stormwater flow control best management practices (BMPs)/facilities constructed as part of an Out of Basin Stormwater Control Transfer Program.
3. Any BMPs/facilities in high priority watersheds built to provide flow control improvements in lieu of making those improvements at an out-of basin project site must be on-line (i.e., fully functional) before or concurrent with any project that shall use that facility to help meet its stormwater requirements.

[4] Designated in Chapters 173-200 and173-201A WAC.

[5] Existing uses are defined in 40CFR 131.3 as "those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards."

[6] NOTE: Other in-basin transfer options for flow control, runoff treatment, and LID improvements are available but are not discussed in the body of this guidance. See Attachment 1.

4. In no case can a permitted jurisdiction allow less stormwater improvement than what would have been realized (i.e., equivalent acreage) by following the jurisdiction's adopted stormwater runoff controls program. That program could include:
   a. The default Appendix 1 permit requirements, or
   b. Requirements approved through S5.C.5 of the Phase I permit, or
   c. Requirements allowed through S5.C.4 of the Phase II permit, or
   d. Alternative requirements established through an Ecology-approved watershed plan per Section 7 of Appendix 1 of the Phase I and II Western Washington Municipal Stormwater Permits.
5. The Permittee must track flow control improvement transfers for each project as explained in Section IV.
6. The Permittee shall provide annual reports to Ecology documenting flow control capacity used and available in offsite facilities associated with this program.
7. Any Permittee implementing a "fee-in-lieu" option must establish a dedicated flow control-account to manage any "fee-in-lieu" payments (public and private) that it collects. These funds will not be used for any capital investment outside of this program.

Specific Technical Guidelines for Flow Control Improvement Transfers

1. Any project in lower priority watersheds transferring stormwater improvements to a high priority watershed must match or improve the pre-project durations within the Flow Control Standard Range. See Table 1 for examples.
2. Flow control transfers will be based on land cover on an area basis for each type of land cover (i.e., impervious surfaces, other hard surfaces, lawn/landscape, and pasture). See Table 2 for examples.
3. For replaced surfaces, permitted jurisdictions may transfer required flow control improvements for the pre-project surfaces to priority watersheds.
4. All new surfaces at development sites must have flow control facilities to match the *pre-project* land cover condition at the project site. The incremental obligation to provide flow control of the pre-project condition to the pre-developed land cover condition may then be approved for transfer to the high priority watershed. If a Permittee does not approve the transfer, the project must provide flow control to the pre-developed condition at the project site.
5. Only effective impervious surfaces, hard surfaces, and converted vegetation areas that are subject to Minimum Requirement #7 have to be considered when determining the areas proposed for transfer and when determining which areas to use for matching existing conditions. See Appendix 1 of the Municipal Stormwater Permits for Western Washington for a definitions of *effective impervious surface* and *converted vegetation areas*.
6. Where regional facilities in a high priority watershed will serve to provide capacity credits for purchase, it should be designed for future build-out of the area draining to it, whenever possible, so that it can fully meet the needs of its drainage area. When a regional facility has exhausted its capacity credits, redevelopment projects within its drainage area that increase

impervious area must either: 1) meet its flow control requirements on-site; 2) transfer its flow control improvements to another flow control facility site within the high priority watershed; or 3) transfer its flow control improvements to another high priority watershed.

Table 1: How MR#7 Flow Control Standards are met in a Stormwater Control Transfer Program		
Surface Subject to MR #7	**Flow Control Improvement Required at a location in a high priority watershed**	**Flow Control Required at Project Site**
New or replaced impervious surface, or converted vegetation areas	Match flow durations within the Flow Control Standard range produced by the pre-project land covers to the pre-developed land cover. Use an equivalent amount and type of pre-project land covers within the High Priority Watershed.	Match flow durations within the Flow Control Standard Range to the *pre-project* land cover condition.

Table 2: Flow Control Requirement Targets for Land Cover Changes in a Stormwater Transfer Control Program		
Pre-Project Land Cover	**Post-Developed Land Cover**	**Flow Control Requirement(s) to be added/used as part of the Development Project**
Forested	New Impervious	Project Site: Impervious to Forested Transfer site: No additional Improvements
Pasture	New Impervious	Project Site: Impervious to Pasture Transfer site: Pasture to Forest
Impervious	Replaced Impervious	Project site: No additional improvements Transfer site: Impervious to forested
Lawn/Landscape	New Impervious	Project site: Impervious to lawn/landscape Transfer site: Lawn/landscape to forested

II. Establishing a Watershed Prioritization for Stormwater Control Transfer Programs in Washington State

The goal of this innovative stormwater management approach is to direct flow control improvements to high priority watersheds. High priority watersheds are those where reducing high stream flows is more likely to contribute to maintaining or restoring designated and existing beneficial uses. At the same time, the approach prevents increasing the flow durations within the Flow Control Standard Range to any receiving water. As individual high priority watersheds are rehabilitated, remaining watersheds are prioritized for improvement until flow duration-related water quality issues in all of the municipality's watersheds are addressed.

Flow control improvements for replaced impervious surfaces, and in some cases, flow control improvements for new impervious surfaces can be transferred to a high priority watershed within the same municipality. These improvements may also be transferred among municipalities with an inter-local agreement to do so. The watershed receiving the improvements ("receiving watershed") must have a higher priority than the watershed from which the improvements are transferred ("sending watershed").

Prioritization Analysis Support

As a first step in establishing the Stormwater Control Transfer Program, a Permittee must articulate a clear prioritization goal/focus (e.g., restore beneficial uses). Next, a Permittee must evaluate its watersheds to identify high priority watersheds (or, "receiving watersheds"), lower priority watersheds (or, "sending watersheds"), and any watersheds excluded from the program.

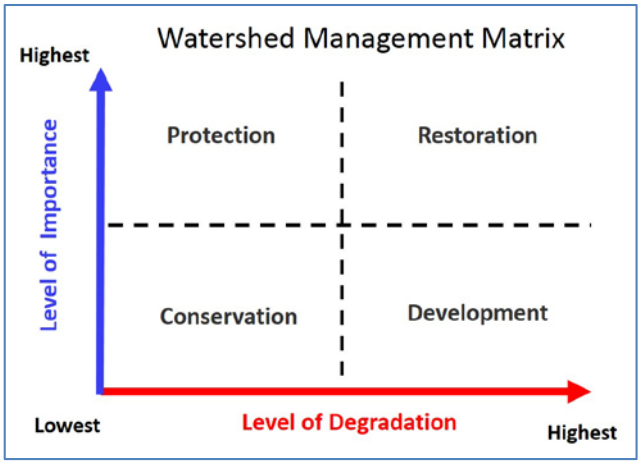

Figure 1: Management matrix for restoration and protection of water flow processes

The Puget Sound Watershed Characterization Process published by the Washington Department of Ecology is one analysis that can be used to set *preliminary* priorities[7]. (For more information, see: http://www.ecy.wa.gov/puget_sound/characterization/index.html.) Generally, watersheds that fall into the "Protection" and "Restoration" categories are expected to rank as higher priority than watersheds in the "Conservation" or "Development" categories (Figure 1). See "Puget Sound Characterization – Volume 1: The Water Resource Assessments (Water Flow and Water Quality)" (Ecology Pub.11-06-016) for an explanation of these categories. https://fortress.wa.gov/ecy/publications/SummaryPages/1106016.html.

[7] The Puget Sound Watershed Characterization output should not be relied upon as the only line of information to designate priorities. Local jurisdictions must verify drainage/watershed area delineations, include finer scale information and may need to perform in-stream assessments to better refine the analysis.

Ultimately, implementing a program to transfer stormwater controls to a site in a different, higher priority watershed requires more detailed, finer scale information about all of a municipality's watersheds. To establish a more detailed, locally informed prioritization, Permittees are encouraged to consult the Building Cities in the Rain Workgroup's[8] four-step process and data source table. Following is an adaptation of the four steps. Permittees must clearly document in their submittal to Ecology all data sources used to prioritize among watersheds.

Step 1: Fish Use and Aquatic Habitat
Review the receiving waterbodies or receiving waters for actual or potential fish use with a focus on the biological conditions and potential for environmental improvement. Give higher priority to receiving waterbodies or receiving waters with low to moderate levels of impairment.

Step 2: Flow Control Opportunities
Assess the watersheds for opportunities to address flow control issues. Give higher priority to watersheds within which hydrologic improvements are expected to accelerate improvements in designated and existing beneficial uses.

Step 3: Environmental Justice Considerations
A Permittee may determine that there are equity and social justice or environmental justice issues that need to be addressed in a given watershed. If two or more watersheds are determined of equal priority using the other data sources listed previously, Permittees are encouraged to consider equity or environmental justice opportunities and needs.

Step 4: Feedback from Federal, Tribal and State Agencies
In all cases, actively seek input from federal (US Fish and Wildlife, NOAA Fisheries, US Environmental Protection Agency), tribal, and state (Departments of Fish and Wildlife and Natural Resources) resource agencies to gain buy-in on proposed watershed prioritization. Those agencies may have data or local knowledge pertinent to establishing priorities, and informed opinions about the relative importance of watersheds. As part of the submittal to Ecology, provide documentation of all outreach efforts, issues raised, and resolution provided.

NOTE: If the Permittee is unable to resolve any issues raised by state, tribal, or federal natural resource agencies, Ecology will confer with that agency prior to making its approval decision.

[8] The Building Cities in the Rain Workgroup is a diverse group of Puget Sound stakeholders convened by the Department of Commerce to address the challenges of meeting state stormwater requirements on a site-by-site basis while also accommodating growth in high density urban centers pursuant to the Washington State Growth Management Act. An early assignment of that group was to develop a watershed prioritization scheme that could support and advance stormwater management, water quality recovery and growth management requirements and aims. Their companion guidance is available at https://www.ezview.wa.gov/site/alias__1780/overview/34828/overview.aspx

Recommended Local Prioritization Data for Flow Control, Low Impact Development and Runoff Treatment

Step 1: Fish Use and Aquatic Conditions	
Actual or Potential Fish Use and Existing Aquatic Conditions: Current Chinook, Coho and other salmonid use and potential use data	
Data Sources	***Comments/Notes5***
Water Resource Inventory Area (WRIA) Plans provide fish distribution information. e.g., WRIA 9 Fish Distribution Maps.	• A local government needs to know that fish are present if they are prioritizing for habitat restoration. • Potential fish use data is highly useful for salmon recovery.
WDFW's SalmonScape web site provides a computer mapping system for salmon recovery planners. It provides lifestage and barriers information for mainstems and named tributaries. It will need to be verified and refined by local data and knowledge, especially for smaller or un-named tributaries.	
WDFW's Salmonid Stock Inventory (SaSI) web site has reports describing and categorizing the status of 435 salmon and steelhead stocks.	
Location of physical and natural barriers: • WDFW maintains a centralized database of fish passage, diversion screening, fish use, and habitat information from inventory efforts on its Fish Passage and Diversion Screening Inventory (FPDSI) database web site. • WSDOT maintains a culvert data base on its web site at *Working with Fish Passage Partners*.	
Subareas (acres) of streams that drain to downstream hatcheries as well as to salmon bearing streams. WDFW hatcheries are listed by county at http://wdfw.wa.gov/hatcheries/facilities.php. A map of the Tribal salmon hatcheries is on the Northwest Indian Fisheries Commission web page.	
County and city-specific fish data, such as the local of physical and natural barriers.	
All available physical stream assessment data related to salmonid habitat conditions, including, but not limited to: pool/riffle ratio; type of substrate; embeddedness; and naturally occurring large woody debris/100 linear feet - weighted average of large woody debris density over walked channel length. This data can be collected by local government staff walking each creek. Standard Operating Procedures for collecting this data can be found at: http://www.ecy.wa.gov/programs/eap/quality.html	Large woody debris is defined as wood at least four inches in diameter and six feet long (WAC 220-110-030), in or over bankfull channel counted by field crews. "Bankfull width" is defined by the Washington State Department of Natural Resources for streams as "the measurement of the lateral extent of the water surface elevation perpendicular to the channel at bankfull depth (WAC 22-16-010). In cases where multiple channels exist, bankfull width is the sum of the individual channel widths along the cross-section (see Forest Practices Board Manual Section 2).
All available physical nearshore marine assessment data related to salmonid habitat conditions (refuge, feeding, and migratory) including, but not limited to: elevation; slope; type of substrate (fish mix gravels); embeddedness; armoring – manmade or natural; and naturally occurring large woody debris/100 linear feet - weighted average of large woody debris density over walked shore length. This data can be collected by local government staff walking the shoreline. The Washington State Department of Natural Resources provides an interactive map of annual eelgrass data at its Puget Sound Eelgrass Monitoring Data Viewer. See also: *Estuarine Habitat Assessment Protocol* (Simenstad *et al.* 1991)	
All available physical river assessment data related to salmonid habitat conditions (refuge, feeding, and migratory), including, but not limited to: pool/riffle ratio; type of substrate (fish mix gravels); embeddedness; and Naturally occurring large woody debris/100 linear feet - weighted average of large woody debris density over walked channel length. This data can be collected by local government staff walking each river. Standard Operating Procedures for collecting this data can be found at: http://www.ecy.wa.gov/programs/eap/quality.html	
A study assessing streams in WRIA 8 provides recommendations for salmon habitat parameters and procedures: http://www.kingcounty.gov/depts/dnrp/wlr/sections-programs/science-section/doing-science/wadeable-streams.aspx	

<table>
<tr><th colspan="2">Step 1: Fish Use and Aquatic Conditions</th></tr>
<tr><td colspan="2">Tree Canopy/Condition of Buffer for Habitat</td></tr>
<tr><td>Data Sources</td><td>Comments/Notes</td></tr>
<tr><td>Tree canopy percentage cover in local government regulatory stream buffers using aerial photography.</td><td>• Tree canopy includes trees with a minimum 10-foot diameter canopy within regulatory buffers for open channel stream reaches within the jurisdictional limits.
• Tree canopy can be used as a tiebreaker between two otherwise equally ranked receiving waterbodies or receiving waters.</td></tr>
<tr><td>Percentage of intact 300-foot vegetated stream buffer using aerial photography.</td><td></td></tr>
<tr><td>Percentage of intact 100-foot vegetated stream buffer using aerial photography.</td><td>The extent of intact buffers throughout a stream system correlates well with fish recovery/potential. Higher values equate to more vegetation. All vegetation including landscaped and mowed or plowed land is included – trees, shrubs, and unmowed grasses.</td></tr>
<tr><td colspan="2">Benthic Index of Biotic Integrity (B-IBI)[9], where appropriate, to measure aquatic health</td></tr>
<tr><td>Data Sources</td><td>Comments/Notes</td></tr>
<tr><td>Other Insect measurements for Marine/Brackish waters: Terrestrial Invertebrates Standard Operating Procedures www.tidalmarshmonitoring.org.</td><td rowspan="3">• BIBI scores provide a quantitative method for determining and comparing the biological condition of streams using the diversity and abundance of macro-invertebrates as indicators. Scores can be shown as the median value of all samples taken from the applicable stream.
• BIBI data is highly useful for fresh water, but is not available for salt water. As it cannot be collected in all streams, other measures of aquatic health may be needed. It is a good metric on a yearly scale for the general health of a stream and shows a good correlation with impervious surface and flow metrics.
• Terrestrial insects are a good indicator of shoreline conditions and an important prey component for juvenile salmon.
• Local government can collect this data relatively inexpensively.</td></tr>
<tr><td>Using passive fallout traps to characterize the insect community simulates insects that could fall on the surface of the water and be available as fish prey. Insect communities may vary depending on the amount of riparian vegetation, shoreline armoring, and other habitat features. Shoreline Monitoring Toolbox. Washington Sea Grant website: https://sites.google.com/a/uw.edu/toolbox/home.</td></tr>
<tr><td>Puget Sound Stream Benthos: Restoration Priorities – King County worked with regional partners to develop a framework for identifying sites and strategies to protect watersheds with “excellent” B-IBI scores or restore watersheds with “fair” B-IBI scores. B-IBI Restoration Decision Framework and Site Identification - This report explains the criteria used for selecting and prioritizing "Fair" B-IBI sites for restoration actions and lists the selected sites.</td></tr>
</table>

[9] Fish Index of Biotic Integrity (F-IBI) is good data where it is available, but it can be hard to interpret as it is stream size dependent.

Step 1: Fish Use and Aquatic Conditions	
Known Water Quality Impairment	
Data Sources	***Comments/Notes***
Ecology listed water quality impairments - State Water Quality Assessment (cat 4a, 4b, 4c, or 5) at Ecology's Water Quality Assessment and 303(d) List.	Waterbodies identified on Ecology's 303(d) list as category 5 or 5B due to impairment from the indicated water quality parameter.
Known water quality concerns based on locally-collected data: High temperature, low dissolved oxygen, and high fecal coliform bacteria. See Ecology's water quality assessment page as a starting point: http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html	These data may be collected by local governments, volunteers, Ecology, and others.
Shellfish bed health - shellfish bed closure(s)- Washington State Department of Health Beach Closures	Shellfish bed closures by the Washington Department of Health are an indicator of water quality issues.
Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment	
Existing/Current Land Cover - Percentage of land in the watershed in each category: forest, pasture, landscaping and impervious surface.	
Data Sources[10]	***Comments/Notes***
Forest – percentage of land per aerial photography or satellite imagery.	• Disturbed land is the area in watersheds that is developed and not impervious, forested, or pasture. • Total impervious area will generally provide enough information for this purpose. For areas with highly porous soils, total impervious surface should be considered.
Pasture - percentage of land per aerial photography or satellite imagery. The pasture in this instance refers to areas that were pasture in the historic condition, i.e. prior to the influence of Euro-American settlement[12].	
Disturbed Land[13] *and Impervious surfaces* - percentage of land in developed areas (all areas not pasture or forest) are identified as disturbed or impervious. This can be done at the parcel level, combining zoning or land use designations into commercial, industrial, low/medium/high density residential, and roads using aerial photography, satellite imagery or literature values.	

[10] Land use and land cover data are often available in the same data set.

[12] See the definition for "Predeveloped Condition" found on Page G-35 of Volume I of the 2014 Stormwater Management Manuals for Western Washington (SMMWW): "The native vegetation and soils that existed at a site prior to the influence of Euro-American settlement. The pre-developed condition shall be assumed to be forested land cover unless reasonable, historic information is provided that indicates the site was prairie prior to settlement."

[13] See with the definition of "Land Disturbing Activities" on found on Page G-25 of Volume I the 2014 SWMMWW: "Any activity that results in a change in the existing soil cover (both vegetative and nonvegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to clearing, grading, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land disturbing activity. Vegetation maintenance practices, including landscape maintenance and gardening, are not considered land-disturbing activity. Stormwater facility maintenance is not considered land disturbing activity if conducted according to established standards and procedures."

The Western Washington Land Cover Change Analysis project provides a look at land cover change over time and provides estimates of percent forest cover and impervious surface for designated catchment areas. It is based on specific aerial photographic analysis. WDFW is currently working on a high resolution land cover change product, available at: http://wdfw.wa.gov/conservation/research/projects/aerial_imagery/index.html Square miles of road density as a percentage of the watershed – as a metric of aquatic health. Local governments will need to derive this data from GIS layers.	• Effective impervious surface is the area in developed watersheds that is impervious and directly connected to the storm drain system.[11] But if effective impervious area information is available, it can be more useful. • If comparing two identical watersheds and one has a much higher effective impervious area, it should be considered for high priority retrofit designation. • A local government should use the best available data to determine these surfaces. See the Western Washington Land Cover Change Analysis discussed under Data Sources.
Existing/Current Land Use Data – Percentage of land in use for commercial, industrial, roads (include the right-of-way parcel, private, and public roads), single-family and multi-family residential, and parks and undeveloped land.	
Data Sources	**Comments/Notes**
Land uses are parcel based and calculated by summing different land use types into the categories presented from a maintained city or county Land Use GIS database.	
Buildable Lands Analysis per RCW 36.70A.215 information can also be used. Under the Buildable Lands Program, five Puget Sound counties (King, Snohomish, Pierce, Kitsap and Thurston) monitor the intensity and density of development to determine whether a county and the cities within its boundaries are achieving urban densities sufficient to meet state growth projections. The 2014 reports can be viewed on county web sites at: • King County Buildable Lands Report 2014 • 2014 Pierce County Buildable Lands Report • Snohomish County 2012 Buildable Lands Report • Kitsap County 2014 Buildable Lands Report • Thurston Regional Planning Council Buildable Lands Program – Thurston County 2014 Buildable Lands Report	• Land use designations/zoning are not always indicative of existing uses. • This exercise should be simple once the jurisdiction decides what to use for categories of existing land use. • Runoff treatment transfers should go to a like land use or to a land use with greater pollutant-generating potential.
City or county mapped number of culvert crossings (street, driveway or utility)/1,000 linear feet on mapped stream channels in each watershed within the jurisdiction. Local governments should use DNR or their own stream typing for mapping.	• Doesn't include trail bridges, long storm pipes, pipe outfalls, or piped sections of stream headwaters (even if mapped in culvert layer). • Multiple parallel culverts are counted as one crossing.
SalmonScape web site maintained by WDFW provides a computer mapping system for salmon recovery planners. It has lifestage and barriers information for mainstems and named tributaries. It will need to be verified and refined by local data and knowledge, especially for smaller or un-named tributaries.	

[11] Municipal Stormwater Permits for Western Washington, Appendix 1, Section 2, Definitions related to Minimum Requirements for a complete definition of "effective impervious surface".

Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment	
Age and condition of stormwater management treatment and flow control infrastructure	
Data Sources	***Comments/Notes***
Local government inventory of outdated flow control infrastructure needing retrofit based on flow duration. Infrastructure built to earlier stormwater design standards (or prior to adoption of standards) is likely to be more appropriate for retrofit.	• Local government infrastructure inspection and maintenance records may offer insight into the age and condition of stormwater controls. • This data indicates the environmental lift potential from installing stormwater retrofits. While a good indicator, not all jurisdictions will have this information.
Local government mapped number and distribution of stormwater piped and ditch outfalls.	• Mapped stormwater outfalls draining pollution generating surfaces for 1,000 linear feet on all stream classes within the jurisdiction. • All permitted MS4 cities and counties are required to map all known MS4 outfalls and discharge points.
Ripeness to proceed	
Data Sources	***Comments/Notes***
Local knowledge of alignment with other programs such as tree planting, capital improvement plan, asset management plans, etc.	This criterion recognizes opportunities for leveraging other programs.
Watershed Area Data	
Data Sources	***Comments/Notes***
Watershed area data –inside and outside jurisdictional boundaries. Local governments could be very accurate with this exercise or simply use topography to delineate areas that drain to each receiving water body/receiving waters. If nothing else, local governments could use catchments delineated in the Puget Sound Watershed Characterization Model.	Includes stormwater conveyance and topographic based watershed.
Each stream length—total stream miles and percentage of total stream miles within jurisdictional boundaries. Local governments should create their own stream data, which likely occurred as part of developing the critical areas ordinance.	• Even with inaccuracies local critical area maps should be sufficient. • Newer LiDAR data to map water bodies is by far the most accurate. • If a stream flows into the jurisdiction from a less developed area outside the jurisdiction, then the jurisdiction may want to prioritize that stream. Context will be important to understand the habitat well.
Class II (Department of Natural Resources Type F plus S[14]) stream length inside jurisdictional boundaries. Local critical area mapping may provide this data.	

[14] The Washington State Forest Practices Board has adopted an interim water typing system in WAC 222-16-031. Type F streams have fish use as defined in WAC 222-16-031(2) and (3). Type S streams are inventoried shorelines of the state as referenced in WAC 222-16-031(1).

Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment	
Coordination with State, Regional and Local Plans	
Data Sources	***Comments/Notes***
The Puget Sound Salmon Recovery Plan includes strategies and actions associated with marine and freshwater habitat protection and restoration, hatchery management, and harvest management. The Watershed Recovery Plan Chapters of the Salmon Recovery Plan include three-year work plans that identify priority projects and programs that can be started within the next three years. This includes capital and non-capital activities/projects for habitat protection and restoration.	
Total Maximum Daily Load plans, active and planned: A total maximum daily load (TMDL) is a numerical value representing the highest amount of pollutant a surface water body can receive and still meet water quality standards. Washington State's TMDL process identifies pollution sources within a watershed and determining what needs to change so that pollution is reduced or eliminated. A TMDL plan is developed with public input, and implemented through water quality improvement projects.	
Puget Sound Initiative Site Cleanups - Through the Puget Sound Initiative, Washington State has committed the resources and funding for a healthier Puget Sound and surrounding communities. Ecology's Toxics Cleanup Program has identified contaminated sites within one-half mile of the Sound. Ecology is taking a baywide approach, rather than site-specific, approach to cleaning up numerous sites within a geographic area. The web site provides information on identified projects in each of these bays.	
Puget Sound Action Agenda Ecosystem Recovery Targets – Setting targets is a critical part of the Action Agenda. The Partnership adopted ecosystem recovery targets as policy statements that reflect the region's commitments to and expectations for recovery, or a measurable path to recovery, by 2020. Targets are based on scientific understandings of the ecosystem. For example, a freshwater water quality target of B-IBI scores in small streams.	
Endangered Species Act listings and critical habitat designations – The federal services (NOAA Fisheries, US Fish and Wildlife, etc.) have authority under the federal Endangered Species Act to list plant or animal species as endangered (in danger of extinction) or threatened (likely to become endangered), and to designate critical habitat that must be protected for the species. For example, Chinook Salmon are listed as threatened with critical habitat in Puget Sound.	
Existing prioritization efforts if available, especially those with tribal co-manager involvement. [15]	

[15] See King County example at http://www.govlink.org/regional-water-planning/tech-committees/trib-streamflow/TribStrmflwFinalReport10-2006.pdf.

Step 3: Environmental Justice and Social Equity (Tie Breaker)	
Coordination with State, Regional and Local Plans	
Data Sources	***Comments/Notes***
The U.S. Environmental Protection Agency (EPA) provides an Environmental Justice Screening and Mapping Tool that may help a city or county identify areas with minority and/or low-income populations, potential environmental quality issues, or the potential for disproportionate impacts due to a combination of environmental and demographic indicators.	A city or county may determine that there are equity and social justice or environmental justice issues that need to be addressed in a watershed. If two or more watersheds are determined of equal priority using the other data sources listed above, cities and counties are encouraged to prioritize a watershed for stormwater retrofits using the factors in the EPA's ESJ Screening and Mapping Tool that are appropriate to their jurisdiction.

Prioritization Principles to Consider

As part of the prioritization analysis, Permittees must consider the following principles for establishing priority watersheds:

1. Give higher priority to watersheds with waterbodies that show low to moderate levels of impairment (e.g., as assessed via water quality data, Benthic Index of Biotic Integrity (B-IBI) scores, habitat surveys). These watersheds are expected to benefit more quickly as a result of stormwater control improvements.
2. Give higher priority to watersheds where the municipality can exert greater influence. For example, assign higher priority to watersheds that have most of their associated drainage area within the municipality, or where an inter-local agreement is in place with one or more neighboring municipalities to implement the transfer approach. In other words, if the municipality coordinates a priority watershed identification and rehabilitation strategy approach with a neighboring municipality, a shared watershed may score higher.
3. Give higher priority to watersheds where regional rehabilitation efforts are also focused. Certain watersheds may be identified as important under other planning processes such as WRIA plans, Salmon Recovery Plans, MTCA/Superfund cleanups, Endangered Species Act listings and critical habitat designations. Watersheds listed in the 303(d) Watershed Assessment as Category 5 based on B-IBI scores may warrant higher priority if low B-IBI scores are likely due at least in part to hydrologic conditions).

III. Considerations for Developing an Effectiveness Monitoring Plan for Stormwater Control Transfer programs

Background

The Washington State Pollution Control Hearings Board ruled (PCHB No. 10-013) that a monitoring program is necessary to confirm the equivalency of a stormwater control transfer approach concerning compliance with default stormwater management requirements in the Phase I Municipal Stormwater Permit. Ecology supports the concept of establishing a monitoring program to document the effectiveness of a Stormwater Control Transfer Program in improving water quality and/or quantity conditions in a targeted, priority watershed and offers the following guidance for establishing such a program.

Overview

The purpose of a monitoring plan is to measure the effectiveness of improvements in the priority watershed(s) where stormwater facilities have been constructed under a Stormwater Control Transfer Program. The monitoring plan shall track stream hydrologic changes. Monitoring in priority watersheds in advance of facilities' construction is necessary to establish a baseline condition. Repeat the monitoring at some infrequent interval (i.e., annually is probably not necessary) to track cumulative improvements over a number of years, and after significant increments of program implementation.

An approach that would provide the most definitive data involves installing continuous recording stream flow gages to record flow data over a period of at least one year to establish a baseline. Two or more years of continuous streamflow data prior to initiating construction of flow control BMPs in the priority watershed is preferred. The more data available to establish the baseline, the more likely changes in stream flows as a result of BMP implementation will be discernible through computation of various hydrologic metrics. (If the watershed under study includes upgradient areas with uncontrolled inputs, then gages upstream and immediately downstream of the transfer area in the priority watershed will be needed.) Repeat the monitoring in a future year(s) after the Stormwater Control Transfer Program is well under way, and a significant portion of the priority watershed has been retrofitted with flow control BMPs.

The continuous streamflow monitoring described is the preferred option. However, municipalities can also consider reducing the monitoring to focus on capturing stream flows during storm events. Rainfall and corresponding flow gage-based monitoring should target a number of storms, covering all seasons and a range of storm sizes to define a baseline of stream responses to a variety of events. Repeat the monitoring in a future year after the Stormwater Control Transfer Program is well under way to provide data for comparing the pre- and post- project stream responses. The more pre- and post-data collected, the easier it will be to discern changes in stream flows.

IV. Stormwater Facility Transfer Capacity Credits and Tracking Purpose

This section describes a recommended method by which a municipality implementing a Stormwater Control Transfer Program (SCTP) can:

- Track the stormwater "improvement transfer" obligation for each development project that proposes to either construct its stormwater obligation in another location (equivalent facility), or purchase capacity in a regional stormwater facility.
- Determine the total and available capacity credits of each facility constructed to provide flow control capacity in a priority watershed.

Determining a Project's Stormwater Improvement Transfer Obligation

Flow Control, Minimum Requirement #7: The transfer obligation of a development/redevelopment project participating in a Stormwater Control Transfer Program is to provide flow control facilities fully meeting Minimum Requirement #7 of Appendix 1 of the Phase I or Western Washington Phase II Municipal Stormwater Permit for areas equivalent to the pre-project land cover of the development/redevelopment project site. The transfer obligation shall be represented and tracked as acres of pre-project land cover for each of the following land cover categories:

- Impervious Area
- Other hard surfaces
- Lawn/landscape
- Pasture

NOTE: Projects that convert a forested land cover[16] to any other post-developed land cover cannot make use of the Stormwater Control Transfer Program because the flow durations required to be matched at the project site are those of the forested condition.

Transfer obligation areas will be tracked by the Permittee to the nearest one-hundredth acre. Table 3 provides an example of a proponent proposing a 5 acre re-development project that will convert an existing mixed land use to 100% impervious (5 acres).

[16] Where reasonable historic information indicates that the site was prairie prior to settlement, project applicants model land cover as "pasture" and use that as the land cover condition to be matched.

Table 3: Example Project to demonstrate how and where Flow Control Requirements are met in a Stormwater Transfer Control Program		
Pre-Project Land Cover	**Post-Developed Land Cover**	**Flow Control Requirement(s) to be added as part of the Development Project**
0.5 acres Forested	0.5 acres New Impervious	Project Site: 0.5 Acres Impervious to Forested Transfer site: No additional Improvements (transfer not allowed)
3.3 acres Pasture	3.3 acres New Impervious	Project Site: 3.3 Acres Impervious to Forested Transfer site: 3.3 Acres Pasture to Forest
1.0 acre Lawn/Landscape	1.0 acre New Impervious	Project site: 1.0 acre Impervious to lawn/landscape Transfer site: 1.0 acre Lawn/landscape to forested
0.2 Effective Impervious	0.2 Replaced Impervious	Project site: No additional improvements Transfer site: 0.2 acre Impervious to forested

The Stormwater Control Transfer Program allows the proponent to construct flow control facilities or purchase available capacity in an existing facility in a high priority watershed that serves a contributing area with at least:

- 3.3 acres of Pasture
- 1.0 acres of Lawn/Landscape
- 0.2 acres of Effective Impervious Area

"fully mitigates" ??

Tracking/Storing Stormwater Obligation Transfers

A. Project Transfer Obligation Tables

The project applicant will submit, and the municipality shall retain, tables for each development/redevelopment project proposing a stormwater transfer. The table will identify whether and to what extent surfaces are being managed on-site, and what surfaces are proposed for transfer. A useable tracking table is included as **Table 4**. All of the information in Table 4 shall also be tracked by the municipality. Note that Project ID is a unique ID attached to the project site by the municipality. Similarly, Facility ID is a unique ID attached to the regional facility by the municipality.

A copy of the tracking table shall be retained with the project file. A second copy shall be placed within the file for the facility (regional or equivalent) in which capacity was purchased by that project.

Table 4: Project Transfer Obligation Table	
Project ID: **Project Name**: **Date:** **Address:** **Parcel #:** **Watershed:** **Date of Complete Application:**	**Acres** **(to the hundredth)**
1.Stormwater Control Improvement Transfer to Facility in Priority Watershed	
a. Impervious to Forest Debit	
b. Other Hard Surface to Forest Debit	
c. Lawn/landscape to Forest Debit	
d. Pasture to Forest Debit	
2.Stormwater Control Provided at Project Site	
a. Impervious to Existing Forest	
b. Impervious to Existing Pasture	
c. Impervious to Existing Lawn/Landscape	
d. Other hard surface to Existing Forest	
e. Other hard surface to Existing Pasture	
f. Other hard surface to Existing Lawn/landscape	
g. Lawn/landscape to Existing Forest	
h. Lawn/landscape to Existing Pasture	
i. Pasture to Existing Forest	
~~4.~~ Stormwater Control Provided Only at Facility in Priority Watershed **Facility ID:** **Facility Name**:	
a. Impervious redeveloped as Impervious at the project site	
b. Other Hard Surface redeveloped as Other Hard Surface at the project site	

Notes:
1a = 3a
1b = 3b
1c = 2c + 2f
1d = 2b + 2e + 2h

B. Regional Facility Tracking

The municipality will maintain a table for each regional facility that documents:

- Facility ID.
- Name of Priority Watershed being served.
- Net Capacity in terms of acres of impervious surface, other hard surface, pasture, and lawn/landscape areas that it serves. For more details on calculating the Net Capacity, see **Calculating Net Capacity (in terms of acreage) of Regional or Equivalent Facilities in Priority Watersheds below.**
- Used Capacity in terms of acres of the same land covers noted previously.
- Remaining Capacity in terms of acres of the same land covers noted previously.
- The flow control standard used to determine the facility's capacity credit.

An example of a facility tracking table is included as **Table 5**. The municipality shall update the table upon each purchase of credit by development projects. Credits can be used by projects in a lower priority watershed, and by projects within the drainage area of the regional facility. Whenever a development or redevelopment project occurs within the drainage area to the facility, the new effective impervious and other hard surfaces, and converted vegetation areas draining to that facility subtract from its available capacity in regard to credits available for purchase.

In addition, for each facility, the municipality shall maintain a summary sheet that identifies each project that has purchased capacity and the acreage amount of each land cover type that was purchased by each project, See **Table 6** for an example. The total of Land Cover in **Table 6** shall agree with the Used Capacity column in **Table 5**.

Phase I or Phase II municipal stormwater permittees shall submit as an attachment to their annual reports the regional facility tracking tables that are updated to at least the calendar year covered by the annual report. These tracking tables will be made publicly available through the PARIS database.

Table 5: Example Regional or Equivalent Facility Tracking Table

Facility ID: F001
Facility Name: Sample Detention Facility
Name of Priority Basin Location:

	Net Capacity (X.XX acres)	Used Capacity (X.XX acres)	Remaining Capacity (X.XX acres)
MR #7			
Impervious	5.00	3.05	1.95
Other hard surface	4.00	2.00	2.00
Lawn/landscape	3.00	1.10	1.90
Pasture	2.00	0.50	1.50

Table 6: Example Summary Sheet for Projects using Regional Flow Control Facility				
Project Name and ID No.	**Impervious (X.XX acres)**	**Other Hard Surface (X.XX acres)**	**Lawn/landscape (X.XX acres)**	**Pasture (X.XX acres)**
Elysian Fields; ID No. P123	2.00	1.00	0.60	0.30
Scab Lands Estates ID No. P456	1.05	1.00	0.50	0.20
TOTAL	3.05	2.0	1.10	0.50

C. Equivalent Facility Tracking

A municipality may permit a project applicant with an out of basin development project to construct a facility in a high priority watershed. It is allowable that the constructed facility in the high priority watershed only serves an area that matches the out of basin development project's stormwater improvement obligation. In this case, it may only be necessary to create a **Table 4** and **Table 5** to track the project and its corresponding facility. Since the Equivalent facility will only serve one project, **Table 6** may not be necessary. These tables shall also be submitted as an attachment to the annual reports and made publicly available through the PARIS database.

Allowable Regional and Equivalent Facilities

There are several types of facilities that can serve either as equivalent facilities or as banks with acreage credits that can be purchased by development projects to meet their stormwater transfer obligation. The flow control facility types include:

- Detention Basins
- Retention Basins (Infiltration for flow control)
- Combination Retention/Detention Basins
- Full Dispersion
- Existing facility retrofits
- Permeable Pavements
- Bioretention Facilities
- Reforestation of impervious area, pasture, and/or lawn landscaping on land protected by covenant or easement.

Each of these categories except reforestation has design criteria specified in the *Stormwater Management Manual for Western Washington (SWMMWW)* as amended in 2014. Preferably, new facilities should be designed to meet the historic (generally forested) land cover condition for the areas that they serve. However, the following guidance describes procedures to use where that is not possible.

Calculating Net Capacity (in terms of acreage) of Regional or Equivalent Facilities in Priority Watersheds

A. Detention/Retention Facilities

Permittees will use the following detailed procedure to calculate the Minimum Requirement #7 (flow control) capacity credit earned by regional or equivalent stormwater facilities built in priority watersheds. The procedure uses the Western Washington Hydrology Model (WWHM) to iteratively test the amount of impervious area, lawn, or pasture that is fully controlled to historical conditions by a proposed pond. Recognizing that a new facility may not fully control the area draining to it, the following procedures describe how to design and determine capacity credits for new ponds, and expanded ponds.

No Upgradient Flow Splitters Allowed: Flow splitters upgradient of retention (infiltration), detention, or combined retention/detention facilities are not an acceptable design option where a facility cannot be designed to fully meet the flow control standard for its service drainage area. Flow splitting cannot replicate the distribution of flows that would be produced by a subset of the drainage area.

If the proposed facility does not have a flow splitter, the following steps are an accepted method to determine the Flow Control Net Available Capacity for each Detention/Retention Facility at the beginning of the Stormwater Control Transfer Program (SCTP). Table 7 is provided as a template to be used for each facility.

Step A1- Determine the Pre-SCTP Contributing Area to the Detention/Retention Facility prior to the SCTP

Step A1.1: Is this a new facility that will be constructed after the Ecology approved Stormwater Control Transfer Program?

If Yes:

The Pre-SCTP Contributing area and Capacity is zero. Enter 0 in all boxes on Table 7, Row 1 and Row 2. **Skip to Step 3.**

If No:

Enter the land use (impervious areas, Other Hard Surfaces, Lawn/Landscape, Pasture areas) of the contributing area to the Facility at the prior to SCTP implementation in Table 7, Row 1.

Step A2 - Determine the Pre-SCTP Capacity of the Detention/Retention Facility.

Step A2.1: Determine the smallest Retention/Detention Facility that can meet the Flow Control Standard for the area contributing to the facility prior to the SCTP implementation. Is it smaller than the as-built pre-SCTP Retention/Detention Facility?

If Yes:

The pre-SCTP Capacity is the Pre-SCTP Contributing Area determined in Step 1. Enter this information in Table 7 in Row 2. **Skip to Step 3.**

If No:

If the Detention/Retention Facility cannot meet the Flow Control Standard, begin reducing the contributing area that was entered into the WWHM (preferably by

first eliminating the lawn area, and then by reducing the impervious area) and adjust the Outlet Control Structure. This may be less than the actual area contributing to the facility. Ensure that the facility can bypass up to the 100-year peak flow from the actual area contributing to the facility within the Outlet Control Structure (typically through the standpipe) prior to engaging the Emergency Overflow Spillway. Iterate to ensure that the any overflow structure adjustments do not modified the area that can meet the Flow Control Standard. Enter the modeled area that meets the Flow Control Standard in Table 7, Row 2.

Step A3. Determine the Contributing Area for the Detention/Retention facility in the SCTP program

Enter the characteristics (impervious areas, lawn/landscape, and pasture areas) of the contributing area to the Detention/Retention Facility at the time of SCTP implementation in Table 7, Row 3.

Step A4 Is the SCTP proposed Detention/Retention facility able to meet the Flow Control Standard for the SCTP proposed contributing area?

If Yes:

The proposed SCTP Contributing Area is the SCTP Gross capacity. Enter the contributing area in Table 7, Row 4.

If No:

If the Detention/Retention Facility cannot meet the Flow Control Standard, begin reducing the contributing area that was entered into the WWHM (preferably by first eliminating the lawn area, and then by reducing the impervious area) and adjust the Outlet Control Structure. This may be less than the actual area contributing to the facility. Ensure that the facility can bypass up to the 100-year peak flow from the actual area contributing to the facility within the Outlet Control Structure (typically through the standpipe) prior to engaging the Emergency Overflow Spillway. Iterate to ensure that the any overflow structure adjustments do not modified the area that can meet the Flow Control Standard. Enter the modeled area that meets the Flow Control Standard in Table 7, Row 4.

Step A5- Determine the final Net Capacity credit available for use in the SCTP

Subtract the pre-SCTP capacity determined in Step2 (Table 7 Row 2) from the capacity at SCTP implementation in Step A4 (Table 7 Row 4). Enter this information in Table 7, Row 5

Table 7: Detention/Retention Facility Net Capacity Determination				
Facility Name:	**Impervious (X.XX acres)**	**Other Hard Surface (X.XX acres)**	**Lawn/Landscape (X.XX acres)**	**Pasture (X.XX acres)**
Row 1: Pre-SCTP Contributing Area to Facility				
Row 2: Capacity used Pre-SCTP				
Row 3: SCTP Contributing Area to Facility				
Row 4: Gross Capacity in SCTP Retention/Detention Facility				
Row 5: Net Capacity Available for SCTP				

B. LID Facilities

LID projects built in priority watersheds to support a Stormwater Control Transfer Program must be structural (i.e., permeable pavement or bioretention facilities). If the pavement or bioretention facility fully infiltrates the runoff file as demonstrated by using the WWHM, the entire area draining to it is considered the capacity credit for flow control (MR #7).

C. Reforestation

These are projects that directly convert effective impervious area, landscaped area or maintained pasture in the priority watershed to native vegetation that will develop into a fully evergreen forested condition. The native vegetation area must be protected with a conservation covenant, or with a conservation easement granted to the Permittee in cases where the Permittee does not own the land. In this case, the Capacity Credit is the totals of effective impervious area, lawn/landscaping, and pasture that are converted to native vegetation.

The area undergoing reforestation must meet the following criteria:

- Existing impervious, lawn/landscaped, and pasture areas that are intended for conversion back to native pre-developed conditions must meet the soil quality and depth requirements of BMP T5.13 in Volume V of the *SWMMWW*.
- The area must be planted with native vegetation, including evergreen trees. For further guidelines, see the Washington State Department of Transportation (WSDOT) *Roadside Manual.* Refer to Sections 800 and 810 in regard to design, procedures, and other recommendations pertinent to Accelerated Climax Community Development.
- The area must be permanently protected from development through a conservation easement or some other legal covenant that requires it to remain in native vegetation. The legal covenant may allow logging as long as the area is re-planted in accordance with Department of Natural Resources requirements and remains in long-term forestry.

Reforested areas are considered stormwater facilities and should be mapped and maintained. Existing native vegetation areas that have the potential to be developed cannot be used for this reforestation credit.

Attachment 1: In-Basin Transfers

NOTE: Although the body of this guidance document focuses on out-of-basin transfers, this attachment provides some information for a municipality considering an in-basin transfer program. In-basin transfers are not integral to the Stormwater Control Transfer Program. However, municipalities have an option of allowing in-basin transfers for projects that must comply with Minimum Requirements #6, #7, or #8. This attachment provides:

1) Excerpts from Appendix 1 of the Phase I and II Western Washington Municipal Stormwater Permits regarding in-basin options.
2) Guidance taken from the Stormwater Management Manual for Western Washington (2012, as amended in 2014) pertinent to in-basin transfers. Though this guidance is not expressly incorporated into the municipal stormwater permits, Permittees may infer Ecology's acceptance of programs that follow the guidance.

In-basin transfers are restricted to the extent described in the following section. An in-basin transfer program, and in-basin transfers for individual projects, do not require prior approval of the Washington State Department of Ecology.

Excerpts from Appendix 1 of the 2013 Western Washington Municipal Stormwater Permits

Section 3.3: Redevelopment

The local government may allow the Minimum Requirements to be met for an equivalent (flow and pollution characteristics) area within the same site. For public road projects, the equivalent area does not have to be within the project limits, but must drain to the same receiving water.

Section 3.4: Additional Requirements for Re-development Project Sites

The Permittee may exempt or institute a stop-loss provision for redevelopment projects from compliance with Minimum Requirements #5 On-site Stormwater Management, Minimum Requirement #6 Runoff Treatment, Minimum Requirement #7 Flow Control and/or Minimum Requirement #8 Wetlands Protection as applied to the replaced hard surfaces if the Permittee has adopted a plan and a schedule that fulfills those requirements in regional facilities.

Section 7: Basin Planning

Basin/Watershed planning may be used by the Permittee to tailor Minimum Requirement #5 On-site Stormwater Management, Minimum Requirement #6 Runoff Treatment, Minimum Requirement #7 Flow Control, and/or Minimum Requirement #8 Wetlands Protection. Basin Planning may also be used to demonstrate an equivalent level of treatment, flow control, and/or wetland protection through the construction and use of regional stormwater facilities.

Explanatory Note – i.e., not an excerpt from Appendix 1 of the permits:
A Basin Plan may recommend use of regional facilities in lieu of site-by-site facilities for new development and redevelopment. However, basin planning is not a prerequisite for regional facilities. Regional facilities planning and design can occur without a commitment to Basin Planning. Basin Planning usually encompasses a broader geographic focus. It may include development of alternative strategies for implementing the default Minimum Requirements, including placement of some regional

facilities within a basin. Basin Planning may also include development of alternative (i.e., different) treatment, flow control, and /or wetland protection requirements. Those alternative requirements must have a science basis for determining that the alternative requirements will comply with federal and state statutory requirements.

Excerpts from Volume 1 of the Stormwater Management Manual for Western Washington (as amended in 2014)

Excerpt from Supplemental Guidelines for Section 2.4.1 – New Development:
Regional stormwater facilities may be used as an alternative method of meeting Minimum Requirements #6, #7, or #8, through documented engineering reports detailing how the proposed facilities meet these requirements for the sites that drain to them. Such facilities must be operational prior to and must have capacity for new development.

Where new development projects require improvements (e.g., frontage improvements) that are not within the same threshold discharge area, the local government may allow the Minimum Requirements to be met for an equivalent (flow and pollution characteristics) area that drains to the same receiving water.

Excerpt from Volume 1: Section 2.4.2 - Redevelopment
Local governments can also establish criteria for allowing a redevelopment project to pay a fee in lieu of constructing water quality or flow control facilities on a redeveloped site. At a minimum, the fee should be the equivalent of an engineering estimate of the cost of meeting all applicable stormwater requirements for the project. The local government should use such funds for the implementation of stormwater control projects that would have similar benefits to the same receiving water as if the project had constructed its required improvements. Expenditure of such funds is subject to other state statutory requirements.

Regional Facilities for Redevelopment: *Permittees are reminded that where flow control requirements apply to replaced hard surfaces at a redevelopment site, they may exempt the project from those requirements on replaced hard surfaces if they have adopted a construction plan and schedule for constructing regional facilities within five years that will serve an area that includes the project site, and that will fully meet the flow control standard for that area.*

Glossary

“Beneficial Uses” means uses of waters of the state which include but are not limited to use for domestic, stock watering, industrial, commercial, agricultural, irrigation, mining, fish and wildlife maintenance and enhancement, recreation, generation of electric power and preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state. (excerpted from Western Washington Municipal Stormwater Permit)

"Designated uses" are those uses specified in this chapter for each water body or segment, regardless of whether or not the uses are currently attained. (excerpted from WAC 173-201A-020)

"Existing uses" means those uses actually attained in fresh or marine waters on or after November 28, 1975, whether or not they are designated uses. Introduced species that are not native to Washington, and put-and-take fisheries comprised of nonself-replicating introduced native species, do not need to receive full support as an existing use. (excerpted from WAC 173-201A-020)

Flow Control Standard Range : The range of pre-developed condition discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

Out-of-Basin Transfer: Construction of, or purchase of capacity credit in, a facility that discharges into a receiving water other than the receiving water to which the project site will or does discharge.

In-Basin Transfer: Construction of, or purchase of capacity credit in, a facility that discharges into the same receiving water as the project site.

Pre-developed condition: The land cover that likely existed at the project site prior to European settlement of Western Washington. Pre-developed land covers are either forested or prairie. The latter is represented in approved stormwater runoff models as “pasture.”

Pre-project condition: The land cover of the project site that is either a) the land cover that exists immediately prior to the proposed project; or 2) the land cover that meets the “existing” land cover as that term is defined by the local code. Some local governments establish a specific date as defining the “existing” land cover condition.

jm 3-29-16

BUILDING CITIES IN THE RAIN

Watershed Prioritization Guidance for Stormwater Retrofits
Harmonizing the NPDES Municipal Permit, Growth Management Act, and Puget Sound Recovery
3-1-16

Table of Contents

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Executive Summary

Overview

Targeted watershed recovery and urban redevelopment and revitalization go hand in hand. This guidance describes a process for prioritizing watersheds for stormwater retrofits. It is intended to provide a tool for local governments to target investment in stormwater retrofits in a way that leverages opportunities for salmonid habitat restoration and facilitates redevelopment in urban centers.

Problem Statement

The impetus for this guidance is two-fold, originally based on the experience of two cities. The City of Tacoma has experienced challenges with attracting redevelopment to areas of the City planned to accommodate growth under the Washington State Growth Management Act. The City observed that the complexity and cost of redevelopment in highly urbanized areas is exacerbated by a number of factors, including stormwater management requirements. Paired with a sluggish economy, low rents, and high vacancy rates, these requirements have contributed to pushing redevelopment projects out of Tacoma and into lower-density areas of the county.

Seeking to avoid site-by-site facilities that consume land designated as Regional Growth Centers[1], the City of Redmond built regional stormwater facilities to serve its Downtown and Overlake Regional Growth Centers. The facilities have cost $70 million to date, and more investment is required to equip both regional growth centers with stormwater infrastructure. Although this accomplished the objective of avoiding site-by-site facilities, the multimillion dollar investment will likely not generate healthy aquatic habitat. In response to this reality, the City of Redmond stormwater utility picked up an additional element of its comprehensive plan to implement: restoring aquatic habitat in its urban watersheds. The City chose to develop a watershed management plan that prioritizes watersheds for stormwater retrofits that will support aquatic habitat for salmon. The Citywide Watershed Management Plan, approved by Ecology, allows the City to transfer stormwater retrofits out of basins to those priority watersheds.

The current rate and pattern of redevelopment of urban areas that will require stormwater retrofits will be based on redevelopment market forces and not on the highest-priority watersheds. predicted annual rate of mitigation of new and redevelopment in Puget Sound is 1.6 percent over a 30-year period[2]. At this rate, it will take more than 60 years to retrofit all watersheds, ar r any urbanized creek to be healthy, in the Puget Sound region. Redevelopment will occur where the market demands, and not necessarily in the watersheds with the highest potential for environmental improvement or restoration.

[1] The Puget Sound Regional Council has designated 29 urban centers in central Puget Sound as regional growth centers planned to accommodate housing (53 percent of residential growth) and employment (71 percent of employment growth) by 2040.

[2] Analysis of Stormwater Mitigation Projected to be Constructed by 2040 as Part of New and Redevelopment in WRIA 9, King County, 2014. Note: This number is based on many of the exemptions under the municipal permit not being utilized.

There is not enough funding to retrofit all receiving waterbodies in the immediate future[3]. In order to protect and restore uses (including salmon and shellfish recovery) in high-priority waterbodies, some jurisdictions will not want to wait for redevelopment to occur in the watersheds where those waterbodies are located. Prioritization of watersheds for stormwater retrofits allows jurisdictions to invest in watersheds with the most opportunity for restoring healthy aquatic habitat.

Uses for prioritization

Prioritization can provide environmental benefits in a number of different contexts, such as:

- Informing the needs assessment for the Capital Facilities Element of a local comprehensive plan, including the location and capacity of needed or expanded facilities to adequately control stormwater runoff from existing development;
- Targeting stormwater control investment under a structural retrofit program required under the Phase I permit, S5.C.6;
- Prioritizing project proposals for a grant from the Ecology Stormwater Financial Assistance Program to address pollution caused by existing development;
- Establishing a stormwater control transfer program that targets high-priority watersheds for transfer of stormwater retrofits from watersheds where development is encouraged under local comprehensive plans (see Appendix C and subsection c below); or
- Informing water clean-up plans (Total Maximum Daily Load).

Anticipated Results

Prioritization allows a jurisdiction to target stormwater retrofit investments that provide environmental benefits to areas with the most potential for restoration, while also meeting the requirements of the Growth Management Act. Prioritization provides a tool for targeting the location of and investment in regional detention facilities[4]. As one specific application, it can support a stormwater control transfer program. A transfer program is designed to provide an equivalent and more efficient approach to stormwater management than the Washington Department of Ecology's default program allows.

Prioritization allows cities and counties to move away from site-by-site stormwater facilities that consume land and that have the potential to increase development costs in urban centers that are designated to accommodate projected population and employment growth. Facilitating redevelopment in urban centers reduces the stormwater impacts of sprawl and development in greenfields.

Prioritization of watersheds for stormwater retrofits can target those areas with the most potential for reducing stormwater pollution and restoring salmon habitat. Salmon recovery plans do not address the

[3] The Stormwater Retrofit Analysis and Recommendations for Juanita Creek Basin in the Lake Washington Watershed (2012) found that approximately 68 percent of the 6.8 square mile basin is heavily developed with impervious surfaces (pavement, roofs, etc.). Estimated costs in 2011 dollars to achieve the most effective mitigation were estimated to be $1.4 billion ($30 - $200 million a square mile). However, it should be noted that Juanita Creek has high property values with locations of facilities near waterfront. The cost to retrofit may be lower in other urban areas.

[4] A regional detention facility is a stormwater quantity control structure designed to correct existing surface water runoff problems of a basin or sub-basin. This term is also used when a detention facility is sited to detain stormwater runoff from a number of new developments or areas within a catchment. See Appendix A, Definitions.

stormwater impacts from development that degrade salmon habitat in urbanized areas. Prioritization of receiving waterbodies for stormwater retrofits can facilitate salmon recovery by targeting watersheds with the most potential for restoration. Siting stormwater retrofits that leverage habitat restoration projects can make it possible for salmonids to survive in urbanized water bodies.

Process and Data Sources for Prioritization

This guidance recommends a stepwise approach to prioritizing watersheds for stormwater retrofits. Locally adopted policies regarding water quality and habitat can provide the basis and framework for prioritization and the goals of a stormwater control transfer program. Regional-scale data, such as the Puget Sound Characterization project, and regional plans, such as Water Resource Inventory Area plans, will support a high-level analysis for local prioritization. But the final screen must be informed by local, watershed-specific information. This guidance provides recommendations on types and sources of data easily accessible to local governments for a prioritization process.

Introduction

1.1 Purpose of this Prioritization Guidance

This guidance, prepared by a diverse stakeholder work group convened by the Washington State Department of Commerce, describes a process for prioritizing watersheds for stormwater retrofits. The intent is to protect and restore receiving waters or receiving waterbodies[5] within those watersheds. Prioritized watersheds will be important to protecti almonids and other beneficial uses and are expected to respond to stormwater control retrofits. This guidance provides focused recommendations for western Washington State municipal stormwater permittees with designated regional growth centers[6] under the Puget Sound Regional ncil's VISION 2040. However, it can also be used by local governments for capital facilities planning under the Growth Management Act.

A watershed prioritization effort can be useful to designate high-priority watersheds for stormwater retrofits for a number of purposes. A thoughtful prioritization of watersheds for local projects can:

- Inform the needs assessment for the Capital Facilities Element of a local comprehensive plan, including the location and capacity of needed or expanded facilities to adequately control stormwater runoff from existing development;
- Target stormwater control investment under a structural retrofit program required under the Phase I permit, S5.C.6;
- Prioritize project proposals for a grant from the Ecology Stormwater Financial Assistance Program to address pollution caused by existing development;
- Establish a stormwater control transfer program that targets high-priority watersheds for transfer of stormwater retrofits from watersheds where development is encouraged under local comprehensive plans (see Appendix C and subsection c below); or
- Inform water clean up plans (Total Maximum Daily Load).

This stormwater retrofit prioritization guidance can be used on its own for prioritizing receiving waterbodies for voluntary retrofits, or it can be used as companion guidance to Ecology's *Stormwater Control Transfer Program: Out of the Basin* guidance as part of an infill or redevelopment strategy to increase capacity in urban centers[7].

1.2 Why prioritize watersheds for stormwater retrofits?

There are multiple benefits to prioritizing watersheds for stormwater retrofit investment. The current rate and pattern of redevelopment of urban areas that will require stormwater retrofits will be based on market forces and not on the highest-priority waterbodies. The predicted annual rate of mitigation of

[5] A receiving waterbody or receiving waters are the waters to which a specific geographic area (or, watershed) drain See Attachment A, Definitions.
[6] The Puget Sound Regional Council has designated 29 urban centers in central Puget Sound as regional growth centers planned to accommodate housing (53 percent of residential growth) and employment (71 percent of employment growth) by 2040.
[7] See Appendix C, Stormwater Control Transfer Program.

new and redevelopment in Puget Sound is 1.6 percent over a 30-year period[8]. At this rate, it will take more than 60 years to retrofit all watersheds in the Puget Sound region. Redevelopment will occur where the market demands, and not necessarily in the highest priority watersheds. It is important to note that Chinook salmon and other salmon species are listed as threatened by extinction in western Washington. Providing habitat over the next 60 years from now will not be sufficient to recover these iconic species.

There is not enough funding to retrofit all receiving waterbodies in the immediate future[9]. In order to protect and restore uses (including salmon and shellfish recovery) in high-priority waterbodies, some jurisdictions will not want to wait for redevelopment to occur in the watersheds where those waterbodies are located.

Prioritization allows a jurisdiction to target stormwater retrofit investments that quickly provide environmental benefits to areas with the most potential for restoration, while also meeting the requirements of the Growth Management Act. Prioritization provides a tool for targeting the location of and investment in regional detention facilities[10]. It allows cities and counties to move away from site-by-site stormwater facilities that consume land and that have the potential to increase development costs in urban centers that are designated to accommodate projected population and employment growth.

The City of Redmond chose to develop a Watershed Management Plan to restore all of Redmond's water bodies and provide a coordinated framework for addressing regulatory drivers (Endangered Species listings and Clean Water Act violations), while supporting future development.

> Redmond is taking a watershed-based approach to surface water management to be more strategic with resources, projects, and programs. When applied city-wide, this approach is expected to produce more immediate and measurable positive results relative to the current approach that relies on uncoordinated regulatory drivers to achieve incremental, site-by-site improvements in stormwater management as land is developed or redeveloped over an extended period. Redmond is implementing this approach to achieve the goal of rehabilitating all the City's surface waters over the next 50 to 100 years.[11]

Through careful tracking and reporting to Ecology, Redmond will demonstrate that infrastructure investments (by acres equipped with stormwater controls) will never be less than that achieved by following the default stormwater management requirements under the municipal permit. This commitment will be upheld until all developed areas of the City are equipped with stormwater controls.

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[8] Analysis of Stormwater Mitigation Projected to be Constructed by 2040 as Part of New and Redevelopment in WRIA 9, King County, 2014. Note: This number is based on many of the exemptions under the municipal not being utilized.

[9] The Stormwater Retrofit Analysis and Recommendations for Juanita Creek Basin in the Lake Washington Watershed (2012) found that approximately 68 percent of the 6.8 square mile basin is heavily developed with impervious surfaces (pavement, roofs, etc.). Estimated costs in 2011 dollars to achieve the most effective mitigation were estimated to be $1.4 billion ($30 - $200 million a square mile). However, it should be noted that Juanita Creek has high property values with locations of facilities near waterfront. The cost to retrofit may be lower in other urban areas.

[10] A regional detention facility is a stormwater quantity control structure designed to correct existing surface water runoff problems of a basin or sub-basin. This term is also used when a detention facility is sited to detain stormwater runoff from a number of new developments or areas within a catchment. See Appendix A, Definitions.

[11] City of Redmond Watershed Management Plan, page xiii.

The Growth Management Act requires capital facilities planning to support existing and planned development at urban densities, including stormwater facilities. These include improvements that are necessary to address existing deficiencies or to preserve the ability to maintain existing capacity[12]. A waterbody prioritization process can be used to assess urban areas that do not have adequate stormwater facilities to protect public health and the environment, and to identify needed stormwater retrofits to be included in the Capital Facilties Plan.

1.3 Background of the Building Cities in the Rain project

The Puget Sound Regional Council's Growth Management Policy Board at its May, June and July 2013 meetings heard presentations[13] from the Cities of Tacoma and Redmond, the Departments of Ecology and Commerce, and the Puget Sound Partnership. In Redmond's case, millions had been spent on a regional facility for a redeveloping downtown core, yet environmental benefit proportionate to the cost was not realized. Redmond staff developed a watershed management plan that prioritized watersheds for stormwater retrofits, allowing the city to transfer stormwater controls to achieve environmental improvement. Tacoma's perspective is that the complexity of redevelopment , exacerbated by stormwater management requirements, paired with low rents and high vacancy, has driven development out of downtown Tacoma's regional growth center and into lower-density areas, creating urban sprawl.

The Board discussed the challenges raised in these presentations regarding the high cost of meeting state stormwater requirements on a site-by-site basis, among other costs, while also accommodating growth in high-density urban centers pursuant to the Washington State Growth Management Act . The Puget Sound Partnership South Central Action Area Local Integrating Organization (LIO) also heard from Tacoma, and expressed an interest in working on this issue under an adopted sub-strategy of the Puget Sound Action Agenda.[14]

As a result of the Growth Management Policy Board's discussion and the South Central LIO's interest in sustainable stormwater management, the LIO requested technical assistance from the Washington State Department of Commerce (Commerce) to further understand and develop recommendations to address the issue. Commerce secured funding through a National Estuary Program (NEP) Watershed Protection and Restoration grant to work with local communities to identify land use barriers to implementing the Puget Sound Action Agenda, and policies and regulations to address those barriers, entitled *Regional Alliances.*[15] With this funding, Commerce has researched the issue, provided technical assistance, and convened a work group of interested stakeholders to develop this guidance.

[12] RCW 36.70A.070 and WAC 365-196-415(3)(c) "A capital facilities element includes the new and expanded facilities necessary for growth over the twenty-year life of the comprehensive plan. Facilities needed for new growth, combined with needs for maintenance and rehabilitation of the existing systems and the need to address existing deficiencies constitutes the capital facilities demand."

[13] The presentations are posted on the PSRC Growth Management Policy Board's meetings web site.

[14] Puget Sound Action Agenda Sub-Strategy A 4.2, as amended in the 2014/2015 Action Agenda: "Provide infrastructure and incentives to accommodate new development and redevelopment within urban growth areas"; SC13, "Complete Regional Alliances Project and share results to increase infill development in urban centers while meeting stormwater requirements and Growth Management Act mandates".

[15] Puget Sound Action Agenda Sub-Strategies A 1.2 and 4.1.

Prior to convening the Building Cities in the Rain Work Group, Commerce staff reviewed the Growth Management Policy Board stormwater discussions and met with builders, planners, stormwater managers, and others to gain a better understanding of the issue. The product of this analysis is a background report[16] that identifies key concerns and challenges. The report emphasizes the benefits to water resources of redevelopment and implementing the Puget Sound Regional Council's VISION 2040 Regional Growth Strategy. The Regional Growth Strategy includes policies to minimize new impervious surface and reduces pollution through decreased vehicle miles travelled. It encourages redevelopment of existing pollution generating impervious surfaces to non-pollution generating impervious surfaces (for example, replacing a parking lot with a mixed use building and plaza).

The Building Cities in the Rain Work Group grew out of a subcommittee of the South Central LIO. It includes representatives from Western Washington Phase I and II county and city permittees; the Washington State Departments of Ecology, Fish and Wildlife, Commerce, and the Puget Sound Partnership; the U.S. Environmental Protection Agency; Puget Sound Regional Council; the South Central LIO; Water Resource Inventory Area (WRIA) 8, and the environmental community.[17]

The work group agreed that a successful stormwater control transfer program could be an opportunity to both address the issue of managing stormwater in urban growth centers and to restore healthy habitat in urbanized priority watersheds. They met over a period of 18 months in 2014 and 2015 to develop the methodology in this guidance for prioritizing watersheds for stormwater improvements. Priority watersheds could then be designated to receive certain stormwater control improvements from designated regional growth centers in the central Puget Sound region. The discussions resulted in the realization that there are other uses for prioritization of stormwater controls besides a stormwater transfer control program, such as a structural stormwater retrofit program under the Phase I permit. Consequently, this guidance encourages cities and counties to prioritize their watersheds for stormwater retrofits regardless of whether they are contemplating a stormwater control transfer program.

2. Phasing of Prioritization Guidance - Focus on Regional Growth Centers

The Work Group agreed to take a stepwise, systematic approach to prioritization. Therefore, this first iteration of the guidance will focus on regional growth centers under the Puget Sound Regional Council's VISION 2040 to encourage growth in those areas. If this approach is successful, the group can then consider whether and how guidance for a broader geographic application beyond cities or counties with designated regional growth centers makes sense.

Regional growth centers[18] are the hallmark of VISION 2040. VISION 2040 is a regional strategy for accommodating the 5,000,000 people expected to live in the region by 2040. In addition to a Regional Growth Strategy, it consists of an environmental framework and multi-county planning policies adopted pursuant to the Washington State Growth Management Act[19] to guide local comprehensive land use plans and development regulations. Designated regional growth centers have been identified for housing and employment growth, as well as for regional funding to support that growth. Regional manufacturing/industrial centers are locations for increased employment. Regional centers are

[16] The Background Report is posted on the Building Cities in the Rain project web site.
[17] See Attachment B for the list of Work Group participants.
[18] See Attachment C for a map of the regional growth centers and 40/20 Basins Near Flow Control Exempt Waters.
[19] RCW 36.70A.210 (7).

expected to have subarea plans that meet planning expectations outlined in the Puget Sound Regional Council's Regional Centers Plan Checklist.

In most regional growth centers, reaching population and employment targets will require substantial infill development. In addition to encouraging efficient use of urban land through infill, VISION 2040 encourages maintaining hydrological functions, and where feasible, restoring them to a more natural state.

3. Multiple Community and Regulatory Benefits and Opportunities

Prioritization of receiving waterbodies for stormwater retrofits, including for a stormwater control transfer program, can be used to meet multiple regulatory and community goals. It can be used to meet the requirements of the federal Clean Water Act, while accommodating growth under the state Growth Management Act and meeting recovery goals for Puget Sound and salmon.

3.1 Clean Water Act, including the stormwater permit requirements

Water pollution and altered hydrology caused by development contribute pollutants and stressors such as erosion, scouring and heat to surface waters, impairing beneficial uses such as drinking, fishing, swimming, and other activities. As authorized by the federal Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Historically, industrial, municipal, and other entities obtain NPDES permits if their discharges go directly to surface waters. Separate storm sewer systems include discrete conveyances such as pipes or man-made ditches designed or used to convey or collect stormwater to receiving waterbodies. When owned and operated by a municipal or public entity (e.g., city, county, state), such storm systems (also called MS4s) may be regulated as point sources under an NPDES permit. In Washington State , the NPDES permit program is administered by the Department of Ecology. Since its introduction in 1972, the NPDES permit program is responsible for significant improvements to our nation's water quality.[20]

3.1.1 NPDES Municipal Permits

In Washington State, NPDES MS4 permits have been phased in over time following EPA regulations. "Phase I" MS4 permits are issued to "large and medium-sized" jurisdictions - Clark, King, Pierce, and Snohomish counties and the cities of Seattle and Tacoma. Eighty-two cities and five counties fall under the western Washington "Phase II" MS4 permit for "small jurisdictions."[21]

Under both Phase I and Phase II western Washington MS4 permits, counties and cities must adopt regulations requiring best management practices (BMPs) for new development and redevelopment projects that meet certain project size and type thresholds. The BMPs are designed to: 1) protect water quality by providing runoff treatment, and 2) provide flow controls that reduce stormwater peak flow rates and volumes to prevent channel erosion in rivers and streams.

The permits have requirements that apply to new development and redevelopment depending upon specific conditions as follows:

[20] EPA NPDES web site.
[21] See Attachment D for a list of the western Washington Phase I and II cities and counties.

- Minimum Requirement #5, On-Site Stormwater Management[22] (MR #5, often referred to as the Low-Impact Development requirement, or LID) requires projects to infiltrate, disperse, and retain stormwater runoff at a project site.
- Minimum Requirement #6, Runoff Treatment[23] (MR #6) requires that various types of runoff treatment be provided to address the post-project condition for certain hard and pervious surfaces.
- Minimum Requirement #7, Flow Control[24] (MR #7 Flow Control) requires that qualifying projects control flow durations (for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow) to match those conditions produced by the pre-developed land cover condition (generally, forested) rather than by the immediate pre-project land cover condition. This Minimum Requirement is the focus of Ecology's Stormwater Control Transfer Program guidance.

3.1.2 Prioritization of Receiving Waterbodies for Stormwater Control Improvements

As noted above, prioritization of receiving waterbodies for stormwater control improvements allows a jurisdiction to target stormwater retrofit investments that provide more effective and efficient environmental benefits in water bodies with the most potential for restoration. Prioritization can provide environmental benefits in a number of different contexts, such as:

- Establishing a stormwater control transfer program that targets high-priority watersheds for transfer of stormwater retrofits (see Appendix C and subsection c below).
- Targeting stormwater control investment under a structural retrofit program required under the Phase I permit, S5.C.6;
- Prioritization of project proposals for a grant from the Ecology Stormwater Financial Assistance Program to address pollution caused by existing development;
- Capital improvement planning for stormwater utilities; or
- Water clean up plans (Total Maximum Daily Load or 4B plan).

3.1.3 Basin/Watershed Management Plan as Basis for Stormwater Control Transfers

Both Phase I and Phase II permits allow permittees to tailor certain Minimum Requirements to local circumstances through the use of an Ecology-appproved basin plan or similar water quality and quantity planning effort[25].

A permittee may establish a stormwater control transfer program[26] as an alternate means to provide equivalent or better stormwater controls off site and out of basin if approved by Ecology under the MS4 permit. Doing so allows a permittee to invest in stormwater controls first in watersheds that drain to

[22] Municipal Permits for Western Washington, Appendix 1, Section 4.5, Minimum Reguirement #5, On-site Stormwater Management.
[23] Municipal Permits for Western Washington, Appendix 1, Section 4.6, Minimum Reguirement #6, Runoff Treatment.
[24] Municipal Permits for Western Washington, Appendix 1, Section 4.7, Minimum Reguirement #7, Flow Control.
[25] See the following permit requirements (Phase I: S5.C.5.a.i , Phase II: S5.C.4.a.i).
[26] See Appendix C for a description of a stormwater control transfer program.

priority-receiving waterbodies or receiving waters without degrading lower-priority receving waterbodies or receiving waters, while still meeting permit requirements.

3.1.4 Stormwater Control Transfer Programs

In conjunction with this guidance, the Ecology Stormwater Control Transfer Program guidance presents an opportunity for incentivizing infill development in urban centers while accelerating environmental improvement in other watersheds within a jurisdiction where it will create the most environmental benefit.

A stormwater control transfer program can increase opportunities for infill development in urban centers while meeting stormwater requirements, Growth Management Act goals and requirements, and efforts to help restore priority watersheds. It would allow a local government to transfer a portion of stormwater controls to consolidate the efforts to restore habitat in priority water bodies. By doing so, the amount of developed area with stormwater controls would remain equivalent to or exceed those that would have been realized by following default MS4 permit requirements.

The Ecology guidance provides an alternative approach to conventional onsite stormwater management requirements; under the municipal permits, stormwater mitigation requirements at urban infill and redevelopment sites can be more challenging and costly to implement compared to undertaking a similar project at an undeveloped site. A transfer program allows for stormwater impacts to be mitigated at a location outside the local drainage basin, thereby providing greater flexibility to developers or jurisdictions wanting to infill and redevelop urban areas. The Ecology guidance provides a means for jurisdictions to incentivize infill development in urban centers, through construction of fee-in-lieu stormwater mitigation facilities, while accelerating environmental improvement in other watersheds within a jurisdiction where they will create the most environmental benefit.

Per Ecology's guidance, the goal of a stormwater control transfer program is to direct flow control improvements to watersheds where they will provide more immediate environmental benefit than would be realized under the normal rate of development or redevelopment in the jurisdiction's watershed. At the same time, the approach prevents further degradation in all watersheds (i.e., no development or redevelopment activity will be allowed to create new or additional adverse impacts to any receiving waterbodies or receiving waters.

There is a strong need to encourage redevelopment in cities and denser urban areas in order to accommodate growth, to reduce vehicle miles and trips, and to reduce sprawl and its associated stormwater impacts. Concentrating development in urban centers helps avoid the longer term costs of sprawl, such as increased impervious surface and stormwater runoff, increased need for stormwater infrastructure, and increased flooding, shoreline degradation and erosion. Thoughtful stormwater planning on a watershed-scale that considers a host of options to addressing stormwater runoff impacts can facilitate redevelopment in urban centers while also achieving water quality and habitat restoration goals.

A stormwater control transfer program as described above is expected to yield cost effective and better environmental outcomes in western Washington than the default approach under the permit. The mutually beneficial outcomes of a stormwater control transfer program are to:

- Meet or exceed municipal stormwater permit requirements;

- Improve and inform capital facilities planning decisions under the Growth Management Act by developing a prioritized list of investments;
- Increase capacity to meet local or regional ecosystem/watershed recovery goals with retrofits that leverage salmonid habitat restoration;
- Improve habitat for salmonids or shellfish, or address other sensitive beneficial uses of a waterbody sooner than following the existing default stormwater management approach; and
- Facilitate and expedite development in urban growth centers designated to receive projected population growth under the Growth Management Act.

The decision to develop and implement a stormwater control transfer program is a local policy decision that will require a significant investment of time and resources to implement. Establishing a clear, defensible prioritization approach is an important early step.

3.2 Growth Management Act – Helping Communities Plan Strategically for their Future

Since the Washington State Growth Management Act[27] was passed by the Legislature in 1990, Washington counties and cities have used the Act's planning framework to adopt comprehensive plans and development regulations to:

- Guide where urban growth areas should be located and provide these urban areas with adequate and affordable urban services;
- Protect the environment and enhance the state's high quality of life, including water quality;
- Enhance transportation systems to reduce congestion and create healthy alternative modes of travel; and
- Revitalize downtowns with attractive compact development.

The Growth Management Act requires the fully planning counties and the cities[28] within them to meet all of the requirements under the Act. Counties must, in consultation with cities, adopt countywide planning policies that govern the county and city comprehensive land use plans and development regulations. In central Puget Sound, the Puget Sound Regional Council is required to adopt multi-countywide planning policies that govern countywide planning policies for the four counties (King, Pierce, Kitsap and Snohomish).[29] VISION 2040 contains the multi-county planning policies adopted by the Puget Sound Regional Council under the Growth Management Act.

Prioritization of receiving waterbodies for stormwater retrofits allows a city or county to identify the environmental assets of the community, and to target needed infrastructure where it will have the most environmental benefit. Stormwater planning that facilitates development in regional growth centers implements a number of the multi-countywide planning policies in VISION 2040.[30]

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[27] Chapter 36.70A RCW and related statutes.

[28] 29 counties and the cities within them are required or opted into the requirements to fully plan under the Growth Management Act. All 12 Puget Sound counties and their cities are fully planning under the Act.

[29] RCW 36.70A.210(7).

[30] MPP-En-3: Maintain and, where possible, improve air and water quality, soils, and natural systems to ensure the health and well-being of people, animals, and plants. Reduce the impacts of transportation on air and water quality, and climate change.

MPP-En-5: Locate development in a manner that minimizes impacts to natural features. Promote the use of innovative environmentally sensitive development practices, including design, materials, construction, and on-going maintenance.

3.2.1 Capital Facilities and Utilities Plans

Land use planning under the Growth Management Act requires, "where applicable, the review of drainage, flooding, and stormwater runoff and provides guidance for corrective actions to mitigate or cleanse discharges that pollute waters of the state, including Puget Sound or waters entering Puget Sound."[31] Based on this language and the current municipal stormwater permits, some jurisdictions are addressing these issues in their comprehensive plans and budgets. The City of Kenmore adopted a Surface Water Element in its comprehensive plan that requires implementation of the capital improvement program to maintain and improve its MS4[32]. The Cities of Kirkland, Issaquah, Renton and Tacoma have adopted level of service standards for surface water management in their capital facilities elements[33].

Cities and counties must adopt a six- to 20-year plan of capital projects with estimated costs and proposed methods of financing[34] as part of their comprehensive plan. In regard to new stormwater infrastructure, planning and implementation typically occurs through a site-by-site approach, rather than a comprehensive view of the landscape and actions needed to improve or maintain water quality and habitat. Prioritization of waterbodies for regional facilities provides a more comprehensive, and hopefully more efficient, approach to planning for stormwater management facilities. And, strategically identifying locations for facilities in a capital facilities plan can help address stormwater requirements for regional growth centers.

3.2.2 Creating Compact Communities in Regional Growth Centers

Prioritization provides a tool for targeting the location of and investment in regional detention facilities[35]. It allows cities and counties to move away from site-by-site stormwater facilities that consume land and that have the potential to increase development costs in urban centers. Regional growth centers designated under VISION 2040 are the urban centers where redevelopment is planned

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MPP-En-13: Maintain natural hydrological functions within the region's ecosystems and watersheds and, where feasible, restore them to a more natural state.

MPP-En-14: Restore — where appropriate and possible — the region's freshwater and marine shorelines, watersheds, and estuaries to a natural condition for ecological function and value.

[31] RCW 36.70A.070(1).

[32] Policy SW-1.1.5 states: Implement a Capital Improvement Program that maintains and improves the MS4 in a manner that enhances and protects the City's natural environment, mitigates flooding problems, improves water quality, promotes a reliable and safe transportation network and provides the community a safe and healthy place for living, working and recreation.

[33] The Kirkland 2015 adopted level of service is "Conveyance, flow control, and water quality treatment per the Stormwater Management Manual for Western Washington or equivalent to prevent flooding, and protect water quality, and habitat in streams and lakes." Issaquah's 2015 adopted level of service is the King County Surface Water Design Manual and municipal permit requirements. Renton's level of service is treatment that does not increase pre-developed discharge rates, and conveyance without system surcharging during 25-year storm events and no increased flooding during 100-year events. Tacoma's 2015 adopted level of service is 10-year, 24-hour design storm for private facilities less than 24 inches in diameter, and 25-year, 24-hourdesign storm for all public facilities and private facilities greater than or equal to 24 inches in diameter.

[34] RCW 36.70A.070(3).

[35] A regional detention facility is a stormwater quantity control structure designed to correct existing surface water runoff problems of a basin or sub-basin. This term is also used when a detention facility is sited to detain stormwater runoff from a number of new developments or areas within a catchment. See Appendix A, Definitions.

to accommodate projected population (53 percent of residential growth) and employment growth (71 percent).

A stormwater control transfer program provides additional opportunity for realizing the Growth Management Act's vision of vibrant, compact communities that allow cities and counties to accommodate growth. For example, such a program can provide options for meeting flow control requirements on smaller urban lots by transfering flow control requirements to another site. It can provide cost-effective options and more certainty to developers in urban centers, encourage the growth that is planned in those centers, and help lower infrastructure costs for managing stormwater. A fee-in-lieu program can also be part of the jurisdiction's strategy to fund the necessary retrofits for existing development needed under the Capital Facilities Plan.

3.2.3 Transportation Demand Management and Infrastructure under VISION 2040

By the year 2040, projected population and job growth is expected to boost demand for travel within and through the region by about 40 percent. Regional growth and regional manufacturing/industrial centers, with their concentration of people and jobs, form the backbone of the transportation network for the four-county region. Facilitating growth in designated regional centers reduces the demand for vehicle trips and parking infrastructure, both of which can have significant stormwater impacts. Thoughtful stormwater planning on a watershed-scale that considers a host of options to addressing stormwater runoff impacts can facilitate growth in those centers where public transit and services exist or are planned.

3.2.4 Economic Development and Revitalization

Vibrant downtowns and other urban centers are an essential element for any region-wide economic development strategy because they are traditionally the hubs of economic activity in any community. Market-based incentive programs such as a stormwater transfer control program can encourage economic development in these urban centers planned for housing, employment growth, transit, recreation, and services.

3.2.5 Subarea Plans and Environmental Review

"Up front" environmental review of subarea plans identifies predefined mitigation that provides certainty to developers and the community. Most of the currently designated regional growth centers have subarea plans adopted by the city. A subarea plan is a more detailed version of the comprehensive plan for a specific area, such as a downtown or neighborhood. The Puget Sound Regional Council now requires an adopted subarea plan or "center plan" for designation of new regional growth centers. The plan should include or reference policies and programs for innovative stormwater management.[36]

"Up front" environmental review of subarea plans under the State Environmental Policy Act (SEPA), or predefined mitigation of development, can be used to further streamline permitting and provide incentives for developers in a regional growth center. The predefined mitigation measures could include

[36] See PSRC's Regional Center Plans Checklist.

stormwater retrofits in high-priority watersheds and/or offsite transfers of stormwater controls. Mitigation measures would be predefined in the SEPA document for the subarea plan.[37]

3.3 Puget Sound Action Agenda

The Puget Sound Action Agenda is a regional road map that lays out the work needed to achieve an ambitious goal: restoring the health of Puget Sound by 2020. The 2014/2015 Action Agenda identifies key ongoing programs, local priorities for different areas of the Sound and approximately 300 specific actions that must be implemented over the next two years to stay on track toward recovery targets. The Action Agenda calls for concentrated growth in urban growth areas and improved stormwater controls to implement two of the Action Agenda's three strategic initiatives: (1) Prevent pollution from urban stormwater runoff; and (2) Protect and restore salmon habitat.

Prioritization of receiving waterbodies for stormwater retrofits can target those areas with the most potential for reducing stormwater pollution and restoring salmon habitat. A stormwater control transfer program can be used to facilitate compact development in urban centers and provide opportunities for improving water quality and restoring salmon habitat.[38] Compact development can be facilitated by allowing a developer to pay a fee-in-lieu of constructing stormwater retrofits on site that consume land.

The third Action Agenda strategic initiative is to restore and re-open shellfish beds. Shellfish health begins on land, through reduction of pollution from rural and agricultural lands and maintenance and repair of failing septic systems. Stormwater retrofits in high priority watersheds that drain to marine waters could be used to improve the health of shellfish beds.

3.4 Puget Sound Salmon Recovery Plan

The Puget Sound Salmon Recovery Plan is a regional shared strategy developed in response to listings of Puget Sound Chinook salmon and Summer Chum salmon in Hood Canal under the federal Endangered Species Act (ESA). The recovery plan is mandated by the ESA listing and developed to meet the needs of fish and people. A fundamental assumption of this shared strategy approach is that local watershed efforts are the engine that will lead the region to recovery of salmon. Restoration and protection actions will take place largely at the watershed level. To that end, recovery plans have been developed by local watershed groups for each of the Water Resource Inventory Areas (WRIAs) in Puget Sound. Those plans are comprised of detailed strategies and actions designed to address the limiting factors that have caused the species to be threatened with extinction under the ESA.

Salmon recovery plans do not address the stormwater impacts from development that degrade salmon habitat in urbanized areas. Prioritization of receiving waterbodies for stormwater retrofits can facilitate salmon recovery by targeting watersheds with the most potential for restoration. Building stormwater

[37] For example, an integrated plan/SEPA document, plan-level "non project" SEPA document, planned action environmental impact statement (RCW 43.21C.031), or a subarea plan and environmental impact statement for transit-oriented development (RCW 43.21C.420).

[38] Several strategies in the Action Agenda speak directly to compact communities, clean water and habitat restoration, for example:
A1. Focus Land Development Away from Ecologically Important and Sensitive Areas
A2. Protect and Restore Upland, Freshwater, and Riparian Ecosystems
A4. Encourage Compact Regional Growth Patterns and Create Dense, Attractive, and Mixed-Use and Transit-Oriented Communities

retrofits that leverage habitat restoration projects can make it possible for salmonids to survive in urbanized water bodies.

3.5 Climate Change

Encouraging redevelopment in urban cente lps communities reduce energy use and transportation emissions that contribute to climate change. At 45.7 percent of total greenhouse gas emissions (GHG), transportation is Washington State's largest GHG emissions contributor[39]. Allowing people to walk and use transit reduces their vehicle miles traveled (VMT) and GHG emissions. Increased density alone has a modest impact, but well-planned compact communities with street connectivity, mixed-use, availability of transit, and other smart growth characteristics are also correlated with reductions in VMT. A study by John Holtzclaw found that every time a neighborhood doubles in compactness, the number of vehicle trips residents make is reduced by 20 percent to 30 percent[40]. Smaller housing units increase energy efficiency, and smaller parcel sizes can reduce the rmal emissions that attributable to large lots with larger houses, longer driveways and bigger yards[41].

Based on the scope of analyses King County performed as part of the WRIA 9 Stormwater Retrofit on impacts from climate change on stormwater detention facilities (King County 2014), results indicate a need for approximately a 10-percent increase in storage volumes to meet current flow control design standards. However, the application of this result is extremely limited. The County recommends reviewing outcomes anticipated by July 2018 from current efforts among King County, Washington State Department of Ecology, and the University of Washington Climate Impacts Group. Their goal for this study is to evaluate the effectiveness of current stormwater design standards under projected future rainfall patterns and make recommendations for updating King County design standards to account for climate change impacts. This analysis will inform the next Stormwa Design Manual update, and will result in long-term savings in stormwater infrastructure investment.

Prioritization of receiving waterbodies fo geted stormwater investments can support related efforts for resiliency planning for climate change[42]. Communities can plan for climate change impacts by ensuring new stormwater facilities have adequate flow control and water quality treatment[43].

3.6 Environmental Justice

Prioritizing watersheds for stormwater retrofits can include consideration of environmental justice[44] and social equity issues in economically disadvantaged neighborhoods. These neighborhoods can benefit

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[39] See the Washington State Greenhouse Gas Emissions Inventory, 2010 – 2011.

[40] *Creating Great Neighborhoods: Density in Your Community*, Local Government Commission.

[41] For example, a 2,000-square-foot household consumes 16% more energy for heating and 13% more energy for cooling than a 1,000-square-foot house. See *Growing Cooler*, Smart Growth America (2007).

[42] See the Washington State Integrated Climate Change Response Strategy, and King County's Strategic Climate Action Plan, Section Two, page 112. Also see Attachment E, Resources, for other examples of planning for Climate Change.

[43] See Appendix E, Resources, for examples of community planning for climate change.

[44] EPA defines Environmental Justice as follows:

> Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this Nation. It will be achieved when everyone enjoys the same degree of protection from environmental

from green infrastructure stormwater retrofit projects that include amenities such as street trees, tree canopy along a stream, parks, or projects that reduce flooding. Communities that choose to prioritize their watersheds for retrofits can consider these neighborhoods for retrofits as part of the prioritization process.

Transit-oriented compact communities that are encouraged in sending watersheds through a stormwater control transfer program would enable greater densities. Compact communities should also provide for affordable housing, access to services, and transit options for lower-income households. The Growth Management Act requires cities and counties to plan for the housing needs for all economic segments of the community, and for multi-modal transportation systems[45].

and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

[45] RCW 36.70A.020 and 070.

4. Prioritizing Watersheds for Stormwater Control Improvements

This guidance recommends a stepwise approach to prioritizing watersheds for stormwater retrofits. Locally adopted policies regarding water quality and habitat can provide the basis and framework for prioritization and the goals of a stormwater control transfer program. Regional-scale data, such as the Puget Sound Characterization project, and regional plans, such as Water Resource Inventory Area plans, will support a high-level analysis for local prioritization. But the final screen will be provided by local, watershed-specific information. This guidance provides recommendations on types and sources of data easily accessible to local governments for a prioritization process. Seeking input from natural resources agencies and tribes regarding their prioritization processes will be important. As with any planning process, public input will also be a key step.

Overall Planning Process

1. Establish prioritization goals.
2. Review any regional-scale information as an initial screen. See Puget Sound Characterization Project.
3. Assess local, watershed-specific information. See "Local Prioritization" table as a starting point.
4. Seek input from natural resource agencies and tribes.
5. Involve the public in the prioritization process.
6. For stormwater control transfer programs, seek approval from Ecology.

A stormwater control transfer program must be based on scientifically sound prioritization and will require approval from the Department of Ecology[46]. Ecology will be looking for all of these components as it considers approval of the program. While Ecology approval will not be required for a prioritization program that does not include stormwater control transfers, all of the other steps are recommended in all cases.

4.1 Policy Framework/Prioritization Goals

Policies in the local comprehensive plan or other locally adopted policies help set prioritization goals for stormwater retrofits. They should provide support for improved stormwater management, habitat restoration, and development that supports the Regional Growth Strategy. These policies are also the basis for a stormwater control transfer program designed to facilitate growth in urban centers and provide environmental benefit.

Examples of these types of policies include Kitsap County's Water as a Resource Policy[47], the City of Kirkland's Comprehensive Plan Environment Element Surface Water policies[48], the City of Covington's

[46] Ecology approval will be required under S5.C.5.a.i for Phase I permittees and S5.C.4.a.i for Phase II permittees.
[47] Kitsap County adopted its "Water as a Resource" policy in June 2009. The County recognized that storm and surface water runoff is the leading transport medium of pollution into Puget Sound and its associated wetlands, creeks, streams and rivers in this policy. The policy applies to all county departments that report to the County Board of Commissioners. It is applied to public works projects and the comprehensive plan and development regulations. This policy is the basis for several basin planning projects, including LID retrofit plans that prioritize projects.

Comprehensive Plan Natural Environment Element Water Resource Goal[49], and the City of Redmond's Natural Environment Element Policies[50].

Policies in the comprehensive plan for a fee-in-lieu approach to stormwater and supporting facilities in the capital facilities element, for treatment of waters that discharge to Puget Sound in the land use element, and for identification and support for one or more compact urban centers, could also serve as the basis for prioritizing watersheds.

4.2 Process and Data for Prioritization of Receiving Waters

The data needed for a city or county to prioritize receiving waterbodies or receiving waters for stormwater retrofits should generally be relevant, available and easily accessible.[51] The Department of Ecology's watershed data from the Puget Sound Characterization Project is a recommended starting point for prioritization unless the local government has developed an equivalent watershed analysis. More specific local or regional data, including local knowledge, are also necessary to refine the watershed characterization analysis.

The Department of Ecology's Puget Sound Characterization Project provides a regional-scale tool that highlights the most important areas to protect, and restore, and those most suitable for development. The project is a collaborative effort among Ecology, the Puget Sound Partnership, and the state Department of Fish and Wildlife. The Characterization covers the entire Puget Sound drainage area — from the Olympic Mountains on the west to the Cascades on the east, including the San Juan Islands.

The Characterization includes watershed assessments of:

- Water flow (delivery, surface storage, recharge, and discharge)
- Water quality (sediment, nutrients, pathogens, and metals)
- Landscape assessments of fish and wildlife habitat in three environments:
    - Terrestrial
    - Freshwater
    - Marine shorelines

The assessments prioritize small watersheds, or habitat areas, relative to one another for their protection and restoration value. The Characterization Process analyzes watersheds and sorts them into four different categories – "Protection", "Restoration", "Conservation", and "Development". These

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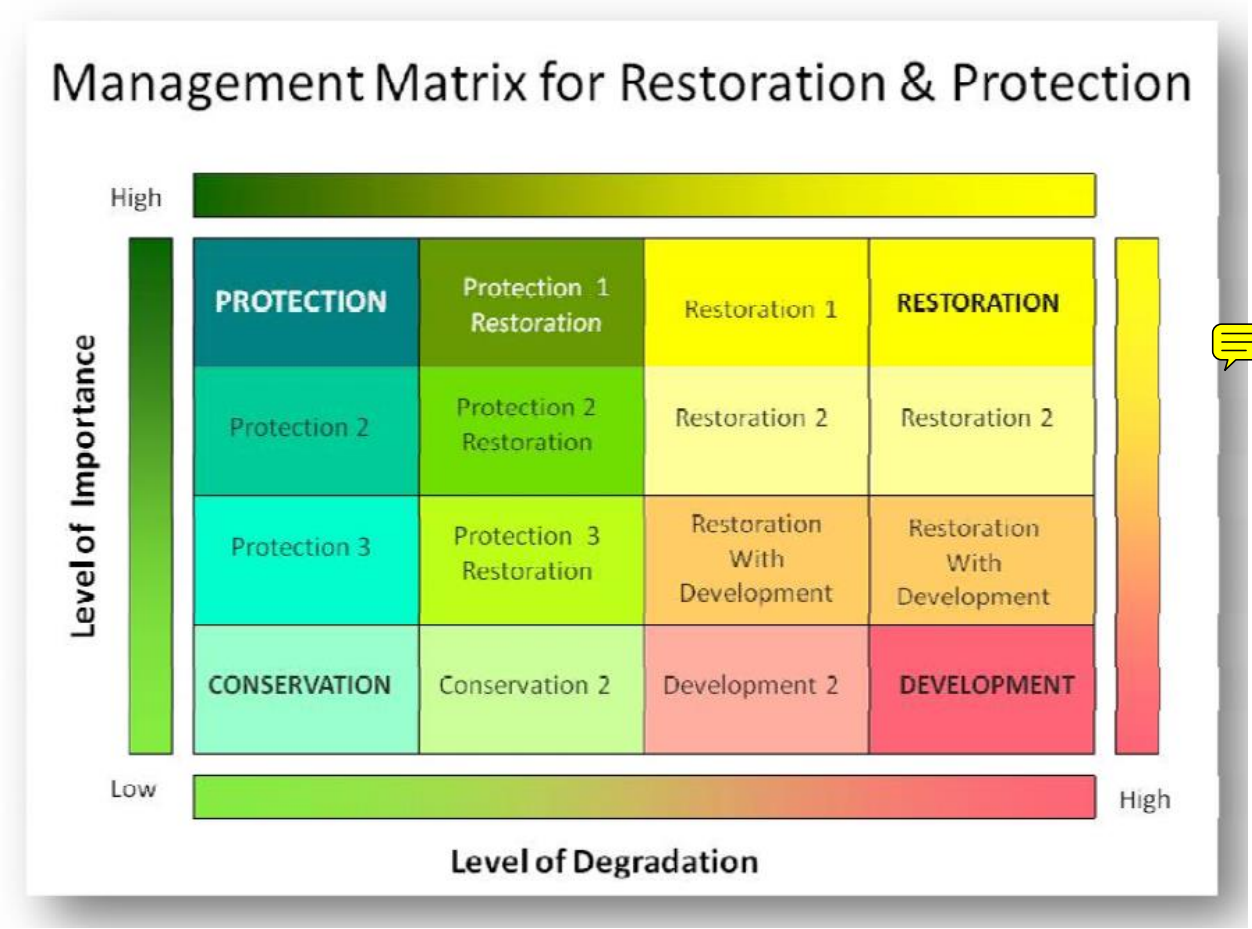
[48] Kirkland policies: E-1.15: Improve management of stormwater runoff from impervious surfaces by employing low impact development practices through City projects, incentive programs, and development standards.
E-1.16: Retrofit existing impervious surfaces for water quality treatment and look for opportunities to provide regional facilities.

[49] Covington policies: NE-III. Protect and enhance water resources for multiple benefits, including recreation, fish and wildlife resources and habitat, flood protection, water supply, and open space.

[50] Redmond policies: NE-67 Maintain surface water quality necessary to support native fish and wildlife meeting state and federal standards over the long term. Restore surface waters that have become degraded to provide for fish, wildlife, plants, and environmentally conscious human use of the water body.
NE-68 Restore, protect, and support the biological health and diversity of Water Resource Inventory Area (WRIA) 8 within the city.
NE-69 Protect and restore natural systems that underpin watershed health and hydrological integrity.

[51] The reliability of data can be confirmed using a Quality Assurance Project Plan. See EPA's Quality System web site.

indices can be used to recommend broad management strategies for specific Assessment Units (small watersheds throughout the Puget Sound basin). The most intensive strategies (broadly denoted "Restorat") apply to those Assessment Units judged most important to restoring water-resource functions but that also have experienced the greatest degradation. Conversely, areas of low importance but also low degradation should require a much lower level of management attention (here termed "Conservation"). Those with high importance and low existing degradation may need little or no active intervention (other than appropriate zoning or protective easements) to maintain their high functional conditions ("Protection"). Those with low imp ce and significant existing human impact are broadly the most appropriate areas for "Development," given continued population pressures on the Puget Sound region.[52]



Ecology indicates that watersheds that fall into the "Protection" and "Restoration" categories are expected to rank as higher priority under a st water control transfer program than watersheds in the "Conservation" or "Development" categories.

4.3 Using Local Data

[52] *Puget Sound Watershed Characterization: Introduction to the Water Flow Assessment for Puget Sound, A Guide for Local Planners,Washington* Department of Ecology, July 2010, page 5.

To implement a successful prioritization and/or stormwater control transfer program, a jurisdiction will need to further prioritize receiving waterbodies or receiving waters based on local conditions. A three-step process described below is recommended for using local data to refine prioritization of receiving waterbodies or receiving waters. Data from the first step can be used to do an initial review of receiving waterbodies or receiving waters. Step 2 data digs deeper into the connection between stormwater management and waterbody quality or value to further refine or validate the initial prioritization. Step 3 provides an avenue for addressing environmental justice issues. The next section of this guidance provides information on sources for this local data.

Step 1: Fish Use and Aquatic Habitat (or other important beneficial uses)

Review the receiving waterbodies or receiving waters for actual or potential fish use with a focus on the biological conditions and potential for environmental lift. Give higher priority to receiving waterbodies or receiving waters with low to moderate levels of impairment[53] as assessed using the following data:

- Percentage of tree canopy/condition of buffer for habitat and shade (This may also be considered at Step 2.)
- Benthic Index of Biotic Integrity (B-IBI) as an indicator of biological conditions.
- Known water quality impairment – 303(d) listings and Total Maximum Daily Loads (TMDLs[54]), local knowledge, or low instream flows – that impact fish mortality and use.

NOTE: If a local government is prioritizing waterbodies for other beneficial uses (e.g., shellfish beds), it should identify the appropriate data sources per the data table below in consultation with the appropriate state and federal agencies.

Step 2: Flow control/LID and runoff treatment opportunities

Review the receiving waterbodies or receiving waters for opportunities to address flow control issues or provide runoff treatment. Give higher priority to receiving waterbodies or receiving waters around which stormwater management improvements are expected to accelerate environmental improvement.

- Percentage of impervious area/land cover in the watershed containing the receiving waterbodies or receiving waters.
- Comprehensive plans and zoning - Understanding the potential for growth in the watershed is necessary for prioritizing and planning a retrofit appropriate for the watershed's future.
- Extent, age and condition of stormwater management treatment and flow control infrastructure – an assessment of the need for retrofits.
- Ripeness to proceed (local knowledge, aligns with programs such as tree planting and stormwater capital improvement plan, etc., that will accrue water quality or stream flow benefits).
- Watershed area data (inside vs. outside jurisdictional boundaries) – Give higher priority to receiving waterbodies or receiving waters in watersheds where the municipality can exert greater influence. However, if the municipality coordinates a priority watershed identification and rehabilitation strategy approach with a neighboring municipality, receiving waterbodies or receiving waters in a shared watershed may be scored higher.

[53] Ecology Prioritization Principle #1 (page 9 of draft Ecology guidance)

[54] TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

- Presence of culverts or other barriers, including natural barriers, to fish passage.
- Coordination with state, regional and local plans – Give higher priority to receiving waterbodies or receiving waters in watersheds where other regional rehabilitation efforts are also focused through:
    - Salmon Recovery Plans (3-year work plans, Water Resource Inventory Area priorities)
    - Total Maximum Daily Load plans (active and planned)
    - Puget Sound Initiative (PSI) Site Cleanups
    - Regional ecosystem goals, e.g. B-IBI
    - Endangered Species Act listings and critical habitat designations by the federal services

Step 3: Environmental Justice and Social Equity Considerations

A city or county may determine that there are equity and social justice or environmental justice issues that need to be addressed in a watershed. If two or more watersheds are determined of equal priority using the other data sources listed above, cities and counties are encouraged to consider environmental justice or social equity criteria to prioritize a watershed for stormwater retrofits. See Step 3 of Recommended Local Prioritization Data table on page 25 for a discussion of tools.

5. Local Data Sources for Prioritization of Receiving Waters

This section provides recommended sources of local data to be used in the prioritization analysis. The data sources are evaluated for flow control, runoff treatment, and low-impact development (LID). Flow control and LID are evaluated together because they both address different parts of a flow regime that can affect stream function. Each jurisdiction will need to provide information on the data used and explain the prioritization process to Ecology and the public[55].

It should be noted that the current Ecology Stormwater Control Transfer Program guidance only applies to transfers of flow control requirements. The recommended Local Prioritization Data include runoff treatment and LID data because they are pertinent to prioritizing a waterbody for stormwater retrofits, and because a jurisdiction may choose to include runoff treatment and LID in a stormwater control transfer program. A jurisdiction that chooses to include runoff treatment and LID in a stormwater control transfer program is advised to work closely with Ecology to ensure their program meets all applicable permit requirements prior to seeking approval under S5.C.5.a.i for Phase I permittees and S5.C.4.a.i for Phase II permittees.

This guidance does not make recommendations regarding weighting of the data for purposes of prioritization. A local government will need to decide whether to use weighting in its process. If it does choose to use weighting to prioritize watersheds for stormwater retrofits, the Washington State Department of Transportation stormwater control transfer program is an example of how weighting can be used. See Appendix G for the criteria and weighting used by the Department.

All of the data and prioritization decisions will be informed by local on-the-ground knowledge of streams and habitat conditions.

[55] For an example of a locally developed data table, see the City of Redmond's Watershed Management Plan, Table 3.1, pages 33 – 34.

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Recommended Local Prioritization Data for Flow Control, Low Impact Development and Runoff Treatment

Step 1: Fish Use and Aquatic Conditions		
Actual or Potential Fish Use and Existing Aquatic Conditions: Current Chinook, Coho and other salmonid use and potential use data		
Data Sources	***Comments/Notes***	***Uses[56]***
Water Resource Inventory Area (WRIA) Plans provide fish distribution information. E.g., WRIA 9 Fish Distribution Maps.	• A local government needs to know that fish are present if they are prioritizing for habitat restoration. • Potential fish use data is highly useful for salmon recovery.	FC/LID, WQ
WDFW's SalmonScape web site provides a computer mapping system for salmon recovery planners. It provides lifestage and barriers information for mainstems and named tributaries. It will need to be verified and refined by local data and knowledge, especially for smaller or un-named tributaries.		
WDFW's Salmonid Stock Inventory (SaSI) web site has reports describing and categorizing the status of 435 salmon and steelhead stocks.		
Location of physical and natural barriers: • WDFW maintains a centralized database of fish passage, diversion screening, fish use, and habitat information from inventory efforts on its Fish Passage and Diversion Screening Inventory (FPDSI) database web site. • WSDOT maintains a culvert data base on its web site at *Working with Fish Passage Partners*.		
Subareas (acres) of streams that drain to downstream hatcheries as well as to salmon bearing streams. WDFW hatcheries are listed by county at http://wdfw.wa.gov/hatcheries/facilities.php. A map of the Tribal salmon hatcheries is on the Northwest Indian Fisheries Commission web page.		
County and city-specific fish data, such as the local of physical and natural barriers.		
All available physical stream assessment data related to salmonid habitat conditions, including, but not limited to: pool/riffle ratio; type of substrate; embeddedness; and naturally occurring large woody debris/100 linear feet - weighted average of large woody debris density over walked channel length. This data can be collected by local government staff walking each creek. Standard Operating Procedures for collecting this data can be found at: http://www.ecy.wa.gov/programs/eap/quality.html	Large woody debris is defined as wood at least four inches in diameter and six feet long (WAC 220-110-030), in or over bankfull channel counted by field crews. "Bankfull width" is defined by the Washington State Department of Natural Resources for streams as "the measurement of the lateral extent of the water surface elevation perpendicular to the channel at bankfull depth (WAC 22-16-010). In cases where multiple channels exist, bankfull width is the sum of the individual channel widths along the cross-section (see Forest Practices Board Manual Section 2).	FC/LID
All available physical nearshore marine assessment data related to salmonid habitat conditions (refuge, feeding, and migratory) including, but not limited to: elevation; slope; type of substrate (fish mix gravels); embeddedness; armoring – manmade or natural; and naturally occurring large woody debris/100 linear feet - weighted average of large woody debris density over walked shore length. This data can be collected by local government staff walking the shoreline. The Washington State Department of Natural Resources provides an interactive map of annual eelgrass data at its Puget Sound Eelgrass Monitoring Data Viewer. See also: *Estuarine Habitat Assessment Protocol* (Simenstad *et al.* 1991)		
All available physical river assessment data related to salmonid habitat conditions (refuge, feeding, and migratory), including, but not limited to: pool/riffle ratio; type of substrate (fish mix gravels); embeddedness; and Naturally occurring large woody debris/100 linear feet - weighted average of large woody debris density over walked channel length. This data can be collected by local government staff walking each river. Standard Operating Procedures for collecting this data can be found at: http://www.ecy.wa.gov/programs/eap/quality.html		
A study assessing streams in WRIA 8 provides recommendations for salmon habitat parameters and procedures: http://www.kingcounty.gov/depts/dnrp/wlr/sections-programs/science-section/doing-science/wadeable-streams.aspx		

[56] Indicates data usefulness for flow control and low impact development (FC/LID) or runoff treatment for water quality (WQ).

Step 1: Fish Use and Aquatic Conditions		
Tree Canopy/Condition of Buffer for Habitat		
Data Sources	***Comments/Notes***	***Uses***
Tree canopy percentage cover in local government regulatory stream buffers using aerial photography.	• Tree canopy includes trees with a minimum 10-foot diameter canopy within regulatory buffers for open channel stream reaches within the jurisdictional limits. • Tree canopy can be used as a tiebreaker between two otherwise equally ranked receiving waterbodies or receiving waters.	FC/LID, WQ
Percentage of intact 300-foot vegetated stream buffer using aerial photography.		FC/LID, WQ
Percentage of intact 100-foot vegetated stream buffer using aerial photography.	The extent of intact buffers throughout a stream system correlates well with fish recovery/potential. Higher values equate to more vegetation. All vegetation including landscaped and mowed or plowed land is included – trees, shrubs, and unmowed grasses.	FC/LID, WQ

Step 1: Fish Use and Aquatic Conditions		
Benthic Index of Biotic Integrity (B-IBI)[57], where appropriate, to measure aquatic health		
Data Sources	***Comments/Notes***	***Uses***
Other Insect measurements for Marine/Brackish waters: Terrestrial Invertebrates Standard Operating Procedures www.tidalmarshmonitoring.org.	• BIBI scores provide a quantitative method for determining and comparing the biological condition of streams using the diversity and abundance of macro-invertebrates as indicators. Scores can be shown as the median value of all samples taken from the applicable stream. • BIBI data is highly useful for fresh water, but is not available for salt water. As it cannot be collected in all streams, other measures of aquatic health may be needed. It is a good metric on a yearly scale for the general health of a stream and shows a good correlation with impervious surface and flow metrics. • Terrestrial insects are a good indicator of shoreline conditions and an important prey component for juvenile salmon. • Local government can collect this data relatively inexpensively.	
Using passive fallout traps to characterize the insect community simulates insects that could fall on the surface of the water and be available as fish prey. Insect communities may vary depending on the amount of riparian vegetation, shoreline armoring, and other habitat features. Shoreline Monitoring Toolbox. Washington Sea Grant website: https://sites.google.com/a/uw.edu/toolbox/home.		
Puget Sound Stream Benthos: Restoration Priorities – King County worked with regional partners to develop a framework for identifying sites and strategies to protect watersheds with "excellent" B-IBI scores or restore watersheds with "fair" B-IBI scores. B-IBI Restoration Decision Framework and Site Identification - This report explains the criteria used for selecting and prioritizing "Fair" B-IBI sites for restoration actions and lists the selected sites.		FC/LID, WQ
Known Water Quality Impairment		
Data Sources	***Comments/Notes***	***Uses***
Ecology listed water quality impairments - State Water Quality Assessment (cat 4a, 4b, 4c, or 5) at Ecology's Water Quality Assessment and 303(d) List.	Waterbodies identified on Ecology's 303(d) list as category 5 or 5B due to impairment from the indicated water quality parameter.	FC/LID, WQ
Known water quality concerns based on locallycollected data: High temperature, low dissolved oxygen, and high fecal coliform bacteria. See Ecology's water quality assessment page as a starting point: http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html	These data may be collected by local governments, volunteers, Ecology, and others.	WQ
Shellfish bed health - shellfish bed closure(s)- Washington State Department of Health Beach Closures	Shellfish bed closures by the Washington Department of Health are an indicator of water quality issues.	FC/LID, WQ

[57] Fish Index of Biotic Integrity (F-IBI) is good data where it is available, but it can be hard to interpret as it is stream size dependent.

Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment		
Existing/Current Land Cover - Percentage of land in the watershed in each category: forest, pasture, landscaping and impervious surface.		
Data Sources[58]	***Comments/Notes***	***Uses***
Forest – percentage of land per aerial photography or satellite imagery.	• Disturbed land is the area in watersheds that is developed and not impervious, forested, or pasture. • Total impervious area will generally provide enough information for this purpose. For areas with highly porous soils, total impervious surface should be considered. • Effective impervious surface is the area in developed watersheds that is impervious and directly connected to the storm drain system.[59] But if effective impervious area information is available, it can be more useful. • If comparing two identical watersheds and one has a much higher effective impervious area, it should be considered for high-priority retrofit designation. • A local government should use the best available data to determine these surfaces. See the Western Washington Land Cover Change Analysis discussed under Data Sources.	
Pasture - percentage of land per aerial photography or satellite imagery. The pasture in this instance refers to areas that were pasture in the historic condition, i.e. prior to the influence of Euro-American settlement[60].		
Disturbed Land[61] and Impervious surfaces - percentage of land in developed areas (all areas not pasture or forest) are identified as disturbed or impervious. This can be done at the parcel level, combining zoning or land use designations into commercial, industrial, low/medium/high density residential, and roads using aerial photography, satellite imagery or literature values.		
The Western Washington Land Cover Change Analysis project provides a look at land cover change over time and provides estimates of percent forest cover and impervious surface for designated catchment areas. It is based on specific aerial photographic analysis. WDFW is currently working on a high-resolution land cover change product, available at: http://wdfw.wa.gov/conservation/research/projects/aerial_imagery/index.html Square miles of road density as a percentage of the watershed – as a metric of aquatic health. Local governments will need to derive this data from GIS layers.		FC/LID, WQ
High vehicle traffic areas – Annual Average Daily Traffic >7,500 based on local traffic count data used to select right-of-ways.		WQ

[58] Land use and land cover data are often available in the same data set.

[59] Municipal Stormwater Permits for Western Washington, Appendix 1, Section 2, Definitions related to Minimum Requirements for a complete definition of "effective impervious surface".

[60] See the definition for "Predeveloped Condition" found on Page G-35 of Volume I of the 2014 Stormwater Management Manuals for Western Washington (SMMWW): "The native vegetation and soils that existed at a site prior to the influence of Euro-American settlement. The pre-developed condition shall be assumed to be forested land cover unless reasonable, historic information is provided that indicates the site was prairie prior to settlement."

[61] See with the definition of "Land-Disturbing Activities" on found on Page G-25 of Volume I the 2014 SWMMWW: "Any activity that results in a change in the existing soil cover (both vegetative and nonvegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to clearing, grading, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land-disturbing activity. Vegetation maintenance practices, including landscape maintenance and gardening, are not considered land-disturbing activity. Stormwater facility maintenance is not considered land-disturbing activity if conducted according to established standards and procedures."

Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment		
Existing/Current Land Use Data – Percentage of land in use for commercial, industrial, roads (include the right-of-way parcel, private, and public roads), single-family and multi-family residential, and parks and undeveloped land.		
Data Sources	**Comments/Notes**	**Uses**
Land uses are parcel based and calculated by summing different land use types into the categories presented from a maintained city or county Land Use GIS database.		
Buildable Lands Analysis per RCW 36.70A.215 information can also be used. Under the Buildable Lands Program, five Puget Sound counties (King, Snohomish, Pierce, Kitsap and Thurston) monitor the intensity and density of development to determine whether a county and the cities within its boundaries are achieving urban densities sufficient to meet state growth projections. The 2014 reports can be viewed on county web sites at: • King County Buildable Lands Report 2014 • 2014 Pierce County Buildable Lands Report • Snohomish County 2012 Buildable Lands Report • Kitsap County 2014 Buildable Lands Report • Thurston Regional Planning Council Buildable Lands Program – Thurston County 2014 Buildable Lands Report	• Land use designations/zoning are not always indicative of existing uses. • This exercise should be simple once the jurisdiction decides what to use for categories of existing land use. • Runoff treatment transfers should go to a like land use or to a land use with greater pollutant-generating potential.	FC/LID, WQ
City or county mapped number of culvert crossings (street, driveway or utility)/1,000 linear feet on mapped stream channels in each watershed within the jurisdiction. Local governments should use DNR or their own stream typing for mapping.	• Doesn't include trail bridges, long storm pipes, pipe outfalls, or piped sections of stream headwaters (even if mapped in culvert layer). • Multiple parallel culverts are counted as one crossing.	
SalmonScape web site maintained by WDFW provides a computer mapping system for salmon recovery planners. It has lifestage and barriers information for mainstems and named tributaries. It will need to be verified and refined by local data and knowledge, especially for smaller or un-named tributaries.		FC/LID, WQ

Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment		
Future Land Use – Comprehensive Plans and Zoning		
Data Sources	***Comments/Notes***	***Uses***
City or county comprehensive land use and zoning maps. County or city zoning, right of way, critical areas, stormwater and other regulations related to land cover.	• Zoning is important because future development impacts to the watershed must be considered. • Function and structure code combinations can be used for each land use type. • Residential zoning for single-family can be further differentiated by development density – for example, four categories of single-family based on parcel size. • Multi-family zoning includes condominiums and apartments. Can include commercial first story with dwelling units above in the commercial area calculation. • Parks and Undeveloped Land – Undeveloped land includes areas that are forest and pasture, as well as other areas that are not developed.	FC/LID, WQ

Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment		
Age and condition of stormwater management treatment and flow control infrastructure		
Data Sources	***Comments/Notes***	***Uses***
Local government inventory of outdated flow control infrastructure needing retrofit based on flow duration. Infrastructure built to earlier stormwater design standards (or prior to adoption of standards) is likely to be more appropriate for retrofit.	• Local government infrastructure inspection and maintenance records may offer insight into the age and condition of stormwater controls. • This data indicates the environmental lift potential from installing stormwater retrofits. While a good indicator, not all jurisdictions will have this information.	FC/LID
Total acres/percentage of developed watershed not equipped with basic runoff treatment using local GIS data: • Can be done by plat and based on the age of the plat. • The percentage can be calculated using the entire watershed minus areas that currently contribute runoff to a basic treatment facility or are currently forest or pasture.	It is important to remove forest and pasture areas from total watershed area to make sure undeveloped areas are not counted in the areas needing basic treatment.	WQ
Local government mapped number and distribution of stormwater piped and ditch outfalls.	• Mapped stormwater outfalls draining pollution generating surfaces for 1,000 linear feet on all stream classes within the jurisdiction. • All permitted MS4 cities and counties are required to map all known MS4 outfalls and discharge points.	FC/LID, WQ

Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment		
Ripeness to proceed		
Data Sources	***Comments/Notes***	***Uses***
Local knowledge of alignment with other programs such as tree planting, capital improvement plan, asset management plans, etc.	This criterion recognizes opportunities for leveraging other programs.	FC/LID, WQ
Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment		
Watershed Area Data		
Data Sources	***Comments/Notes***	***Uses***
Watershed area data –inside and outside jurisdictional boundaries. Local governments could be very accurate with this exercise or simply use topography to delineate areas that drain to each receiving water body/receiving waters. If nothing else, local governments could use catchments delineated in the Puget Sound Watershed Characterization Model.	Includes stormwater conveyance and topographic based watershed.	FC/LID, WQ
Each stream length—total stream miles and percentage of total stream miles within jurisdictional boundaries. Local governments should create their own stream data, which likely occurred as part of developing the critical areas ordinance.	• Even with inaccuracies, local critical area maps should be sufficient. • Newer LiDAR data to map water bodies is by far the most accurate. • If a stream flows into the jurisdiction from a less developed area outside the jurisdiction, then the jurisdiction may want to prioritize that stream. Context will be important to understand the habitat well.	FC/LID, WQ
Class II (Department of Natural Resources Type F plus S[62]) stream length inside jurisdictional boundaries. Local critical area mapping may provide this data.		FC/LID, WQ

[62] The Washington State Forest Practices Board has adopted an interim water typing system in WAC 222-16-031. Type F streams have fish use as defined in WAC 222-16-031(2) and (3). Type S streams are inventoried shorelines of the state as referenced in WAC 222-16-031(1).

Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment		
Coordination with State, Regional and Local Plans		
Data Sources	***Comments/Notes***	***Uses***
The Puget Sound Salmon Recovery Plan includes strategies and actions associated with marine and freshwater habitat protection and restoration, hatchery management, and harvest management. The Watershed Recovery Plan Chapters of the Salmon Recovery Plan include three-year work plans that identify priority projects and programs that can be started within the next three years. This includes capital and non-capital activities/projects for habitat protection and restoration.		FC/LID, WQ
Total Maximum Daily Load plans, active and planned: A total maximum daily load (TMDL) is a numerical value representing the highest amount of pollutant a surface water body can receive and still meet water quality standards. Washington State's TMDL process identifies pollution sources within a watershed and determining what needs to change so that pollution is reduced or eliminated. A TMDL plan is developed with public input, and implemented through water quality improvement projects.		FC/LID, WQ
Puget Sound Initiative Site Cleanups - Through the Puget Sound Initiative, Washington State has committed the resources and funding for a healthier Puget Sound and surrounding communities. Ecology's Toxics Cleanup Program has identified contaminated sites within one-half mile of the Sound. Ecology is taking a baywide approach, rather than site-specific, approach to cleaning up numerous sites within a geographic area. The web site provides information on identified projects in each of these bays.		FC/LID, WQ
Puget Sound Action Agenda Ecosystem Recovery Targets – Setting targets is a critical part of the Action Agenda. The Partnership adopted ecosystem recovery targets as policy statements that reflect the region's commitments to and expectations for recovery, or a measurable path to recovery, by 2020. Targets are based on scientific understandings of the ecosystem – for example, a freshwater water quality target of B-IBI scores in small streams.		FC/LID, WQ
Endangered Species Act listings and critical habitat designations – The federal services (NOAA Fisheries, US Fish and Wildlife, etc.) have authority under the federal Endangered Species Act to list plant or animal species as endangered (in danger of extinction) or threatened (likely to become endangered), and to designate critical habitat that must be protected for the species. For example, Chinook Salmon are listed as threatened with critical habitat in Puget Sound.		FC/LID, WQ
Existing prioritization efforts if available, especially those with tribal co-manager involvement. [63]		FC/LID, WQ

[63] See King County example at http://www.govlink.org/regional-water-planning/tech-committees/trib-streamflow/TribStrmflwFinalReport10-2006.pdf.

Step 3: Environmental Justice and Social Equity (Tie Breaker)		
Coordination with State, Regional and Local Plans		
Data Sources	***Comments/Notes***	***Uses***
The U.S. Environmental Protection Agency (EPA) provides an Environmental Justice Screening and Mapping Tool that may help a city or county identify areas with minority and/or low-income populations, potential environmental quality issues, or the potential for disproportionate impacts due to a combination of environmental and demographic indicators.	A city or county may determine that there are equity and social justice or environmental justice issues that need to be addressed in a watershed. If two or more watersheds are determined of equal priority using the other data sources listed above, cities and counties are encouraged to prioritize a watershed for stormwater retrofits using the factors in the EPA's ESJ Screening and Mapping Tool that are appropriate to their jurisdiction.	FC/LID, WQ

6. Seeking Input from Natural Resource Agencies and Tribes

In all cases, seek input from federal (US Fish and Wildlife, NOAA Fisheries, US Environmental Protection Agency), tribal, and state (Departments of Fish and Wildlife, Ecology and Natural Resources) resource agencies to gain buy-in on proposed prioritization of waterbodies. Those agencies may have data pertinent to establishing priorities, and informed opinions about the relative importance of watersheds.

7. Involving the Public in Prioritization

Conducting public forums or workshops, holding public hearings, and reaching out through social media to inform the public abo ioritization and anticipated outcomes is key to any prioritization process.

8. Seeking Approval from Ecology (Stormwater Control Transfer Programs)

Jurisdictions seeking to use prioritization for a stormwater control transfer program will be required to submit a watershed prioritization package, including the data source list and prioritization goals, along with any correspondence, to Ecology. Finally, ology will need to review the data and the process as part of any approval of a basin/watershed plan under the Phas r II Municipal Permit for Western Washington for purposes of a stormwater control transfer program.

9. Next Steps

The results of any prioritization effort will inform the Capital Facilities Element and Plan to identify areas of existing and new development needing storm er facilities to adequately serve those areas. This thoughtful prioritization and planning process can also be used to seek grant and loan funding to help build the necessary facilities.

Should the local jurisdiction pursue a stormwater control transfer program, the results of the prioritization process can be integrated into a fully developed watershed plan, which includes the basis for the prioritization process, the jurisdiction's methods for applying and tracking transfers, monitoring, and implementation strategies per Ecology's guidance.

APPENDIX A

Definitions

Receiving waterbody or receiving waters - Receiving waterbody or receiving waters means naturally and/or reconstructed naturally occurring surface water bodies, such as creeks, streams, rivers, lakes, wetlands, estuaries, and marine waters, or ground water, to which a MS4 discharges. (See Western Washington Phase I and Phase II Municipal Stormwater Permit Definitions)

High-priority watershed – A high priority watershed is a watershed that has been identified for receiving rehabilitation efforts first under a stormwater control transfer program.

Regional - An action (here, for stormwater management purposes) that involves more than one discrete property. (2014 Stormwater Manual for Western Washington, Glossary, Appendix I-G, page G-36)

Regional detention facility - A stormwater quantity control structure designed to correct existing surface water runoff problems of a basin or sub-basin. The area downstream has been previously identified as having existing or predicted significant and regional flooding and/or erosion problems.
This term is also used when a detention facility is sited to detain stormwater runoff from a number of new developments or areas within a catchment. (2014 Stormwater Manual for Western Washington, Glossary, Appendix I-G, page G-36)

Sending watershed – A sending watershed is a watershed that has been identified for sending rehabilitation efforts to a receiving watershed.

Watershed – A watershed describes an area of land from which all of the water that is on or under it drains to the same place.

APPENDIX B

Building Cities in the Rain Work Group Participants

Andy Rheaume, City of Redmond
Phyllis Varner, City of Bellevue
Kerry Ritland, City of Issaquah
Lorna Mauren, City of Tacoma
Dana deLeon, City of Tacoma
Don Robinett, City of SeaTac
Paul Crane, City of Everett

Doug Navetski, King County
Larry Schaffner, Thurston County

De'Sean Quinn, South Central Local Integrating Organization
Erika Harris, Puget Sound Regional Council
Heather Trim, Futurewise
Scott Stolnack, WRIA 8/King County
John Palmer, U.S. Environmental Protection Agency

Dan Gariepy, Department of Ecology
Abbey Stockwell, Department of Ecology
Anne Dettelbach, Department of Ecology
Bruce Wulkan, Puget Sound Partnership
Bob Vadas, Washington Department of Fish and Wildlife
Stewart Reinbold, Washington Department of Fish and Wildlife
Heather Ballash, Washington Department of Commerce
Tim Gates (formerly Washington Department of Commerce)
Anne Fritzel, Washington Department of Commerce
Anthony Boscolo, Washington Department of Commerce
Lynn Kohn, Washington Department of Commerce

APPENDIX C

Stormwater Control Transfer Programs

What is a stormwater control transfer program?

Washington Department of Ecology is developing concurrent guidance for establishing a stormwater control transfer program under the Phase I and Western Washington Phase II Municipal Stormwater Permits, *Stormwater Control Transfer Program: Out of the Basin*. A stormwater control transfer program allows Western Washington Municipal Stormwater permittees to meet certain flow control permit requirements associated with new or redevelopment projects in designated higher priority watersheds. At its core, it allows a developer to pay a fee or directly construct a facility in an alternate location designated by the local government in lieu of meeting certain stormwater requirements for new development and redevelopment at a given project site.[64] The alternate location would be in a watershed in another part of the jurisdiction where receiving waterbodies or receiving waters[65] are evaluated to have a higher potential for increase in ecological function with implementation of specific stormwater control retrofits/improvements[66].

This prioritization guidance can be used to prioritize receiving waterbodies for stormwater retrofits under a stormwater control transfer program. It allows jurisdictions to evaluate all of its watersheds using a rigorous, replicable analysis. As individual priority watersheds meet waterbody improvement goals, remaining watersheds are prioritized for improvement until all of the municipality's receiving waterbodies or receiving waters attain water quality targets.

The City of Redmond developed its Watershed Management Plan as the basis for a stormwater control transfer program that allows the City to invest stormwater controls first in high prioirity watersheds with the most restoration potential for high quality salmon habitat. The City will not allow further impacts to streams with significant degradation, with the long-term goal of rehabilitation of all water bodies within the City. The City's broader efforts include in-stream projects, buffer projects, and programmatic efforts to reduce development impacts.

Jurisdictions where most of the regional growth centers are located are intended audience of this prioritization guidance for purposes of a stormwater control transfer program. However, other cities and counties may also use this guidance to plan for a stormwater control transfer program, another kind of stormwater retrofit program, or to support other planning and strategic visioning goals. Furthermore, a group of jurisdictions could use this guidance to prioritize watersheds at a regional level. This could include

[64] The Ecology guidance requires that any facilities in priority watersheds built to provide flow control improvements in lieu of making those improvements at a project site must be online before any project may rely on the facility to help meet its stormwater requirements.

[65] Again, it is important to note the difference between a "receiving watershed" and "receiving waterbodies or waters" per the definitions in Attachment A.

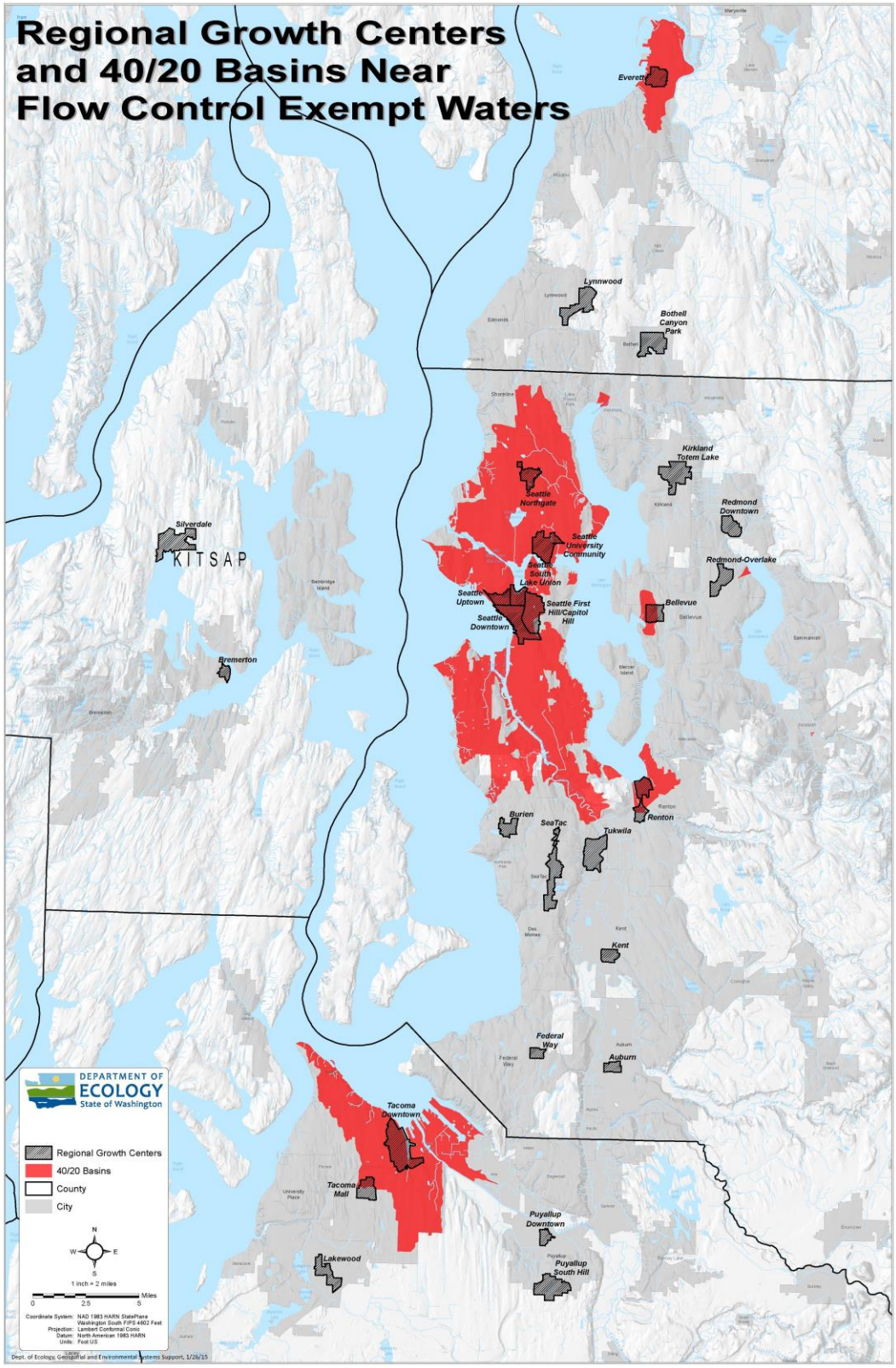
[66] Such areas are called "high-priority watersheds". The original site where new development or redevelopment is proposed to take place is located in what is called a "sending watershed". Sending watersheds are determined to present a lesser immediate potential for environmental lift or restoration associated with stormwater control upgrades.

prioritization that justifies the transfer of stormwater control improvements across jurisdictional boundaries[67] or the prioritization of stormwater retrofit investments across a broad geographic region.

For the purpose of a stormwater control transfer program, regional growth centers are the assumed sending areas, but receiving areas for retrofits can also be located in regional growth centers. While designation of regional growth centers may have taken the environment into account, stormwater issues were not necessarily considered and, in fact, parts of some regional growth centers may be prioritized for retrofit. Further, not all regional growth centers can be designated as sending areas. For example, areas within cities designated by Ecology as highly urbanized areas would not have a reason to adopt a stormwater control transfer program for flow control as these areas need only match pre-project conditions under flow control requirements. See Ecology's Flow Control Guidance for Highly Urbanized Areas. It is also the case that some regional growth centers may be designated as higher priority through the process described in this guidance.

[67] There may be some challenges to establishing an inter-jurisdictional program with the sending jurisdiction's ability to account for transfers, and the ability to ensure control and maintenance of a stormwater facility that it does not own and is outside its jurisdictional boundaries.

APPENDIX D (will be updated to reflect Issaquah's RGC)



WHO'S COVERED UNDER THE MUNICIPAL STORMWATER PERMITS?

Phase I Cities and Counties				
Seattle				Snohomish County
Tacoma				King County
				Pierce County
				Clark County
Western Washington Phase II Cities and Counties				
Aberdeen	Des Moines	Lakewood	Orting	Cowlitz County
Algona	DuPont	Longview	Pacific	Kitsap County
Anacortes	Duvall	Lynden	Port Angeles	Skagit County
Arlington	Edgewood	Lynnwood	Port Orchard	Thurston County
Auburn	Edmonds	Maple Valley	Poulsbo	Whatcom County
Bainbridge Island	Enumclaw	Marysville	Puyallup	
Battleground	Everett	Medina	Redmond	
Bellevue	Federal Way	Mercer Island	Renton	
Bellingham	Ferndale	Mill Creek	Sammamish	
Black Diamond	Fife	Milton	SeaTac	
Bonney Lake	Fircrest	Monroe	Sedro-Woolley	
Bothell	Gig Harbor	Mountlake	Shoreline	
Bremerton	Granite Falls	Terrace	Snohomish	
Brier	Issaquah	Mount Vernon	Snoqualmie	
Buckley	Kelso	Mukilteo	Steilacoom	
Burien	Kenmore	Newcastle	Sumner	
Burlington	Kent	Normandy	Tukwila	
Camas	Kirkland	Park	Tumwater	
Centralia	Lacey	Oak Harbor	University Place	
Clyde Hill	Lake Forest	Olympia	Vancouver	
Covington	Park		Washougal	
	Lake Stevens		Woodinville	

http://www.ecy.wa.gov/programs/wq/stormwater/municipal/MuniStrmWtrPermList.html

APPENDIX F

Resources

Biotic criteria associated with land cover studies

- Horner, R.R., and C.W. May. 1999. Regional study supports natural land cover protection as the leading best management practice for maintaining stream ecological integrity. Proceedings of the Comprehensive Stormwater and Aquatic Ecosystem Conference. Auckland, New Zealand. 12 pp. *http://stormwater.cecs.ucf.edu/research/bioassessment/pugetsoundfinalreport.pdf*
- Booth, D.B., and L.E. Reinelt. 1993. Consequences of urbanization on aquatic systems — measured effects, degradation thresholds, and corrective strategies. Pages 545–550 in U.S. Environmental Protection Agency (ed.). Proceedings Watershed '93: a national conference on watershed management. Alexandria, VA (http://www.sciencetime.org/ConstructedClimates/wp-content/uploads/2013/01/BoothReinelt1993.pdf).

Density as a BMP Publications

Dense and Beautiful Stormwater Management, Laurence Aurbach, Ped Shed Blog, 2010.
Watersheds, Walkability and Stormwater, Stormwater: The Journal for Surface Water Quality Professionals, 2011.
Is Denser Greener? An Evaluation of Higher Density Development as an Urban Stormwater-quality Best Management Practice, John S. Jacob and Ricardo Lopez, Journal of the American Water Resources Association, 2009.
Forest Cover, Impervious-Surface Area, and the Mitigation of Stormwater Impacts, Derek Booth, David Hartley and Rhett Jackson, Journal of the American Water Resources Association, 2007
A Browner Shade of Green, Lisa Nisenson, Planetizen, 2007.
The High Cost of Free Curb and Gutter, Lisa Nisenson, Planetizen, 2013.

Comprehensive Plan Land Use Policies recognizing water as a resource

Issaquah: Land Use Policies D1 – D5 pursuant to Land Use Goal D. Improve stormwater quality and management.
Tacoma: Environment Policy EN-1.25 re developing management plans for each of the City's watersheds (proposed for adoption in December 2015)

Capital Facilities Plans including planned stormwater facility projects

Covington
Kenmore
Kirkland
Issaquah
Renton
Tacoma

Planning for Climate Change

Washington State Integrated Climate Change Response Strategy
Oregon State University Prism Group
King County's Strategic Climate Action Plan
Olympia
Seattle
Tacoma
Shoreline
Snohomish County
Olympia – sea level rise
OSU Prism Group

Washington State Department of Transportation NPDES and State Waste Discharge Municipal Stormwater Permit
Effective: April 5, 2014

Appendix 5: Stormwater Management Program Plan

Section 6: Stormwater BMP Retrofit for Existing Facilities

6.6 Stormwater Retrofit Prioritization Process

WSDOT's stormwater retrofit prioritization scheme (*Table 6-1*) involves a qualitative process for assigning a retrofit priority value to specific road segment locations. The stormwater retrofit prioritization scheme:

1. Focuses data collection on areas with the greatest stormwater retrofit needs;
2. Targets urban fringe areas before costs escalate;
3. Reduces costs by identifying opportunities to combine stormwater retrofits with construction projects; and
4. Maximizes immediate benefits by first targeting areas with highest environmental benefits relative to cost.

Table 6-1 describes the criteria and rationale for each prioritization factor encompassed in this approach. The first stage in the prioritization process involves screening the entire state using Geographical Information Systems (GIS) map tools. This screening identifies highway segments having predefined conditions known to present greater than average risks for highway stormwater impacts. Stage 2 of the prioritization process involves a site-specific reconnaissance of high scoring Stage 1 retrofit candidate sites (i.e., highway segments receiving scores of 8 to 16) to identify those with closed conveyance systems; known high habitat value; and known or observable erosion, pollution, or flooding problems. The third and final prioritization stage involves collecting detailed site information to determine drainage areas and estimate retrofit costs. The results of Stage 3 allow WSDOT to readily evaluate whether: 1) It makes sense to package nearby retrofit segments (and the gaps between those projects) into a single stand-alone retrofit project; and 2) If the potential exists to bundle any of the retrofit priorities with programmed highway projects rather than advancing them as separate stand-alone retrofit projects. Those priorities not falling within a programmed highway project boundary will get completed in order of their priority ranking score for each of the three regions of the state as stand-alone retrofits.

WSDOT updates stormwater retrofit prioritization scores to reflect new information and changing conditions brought to our attention.

Table 6-1: Stormwater Retrofit Prioritization Scheme

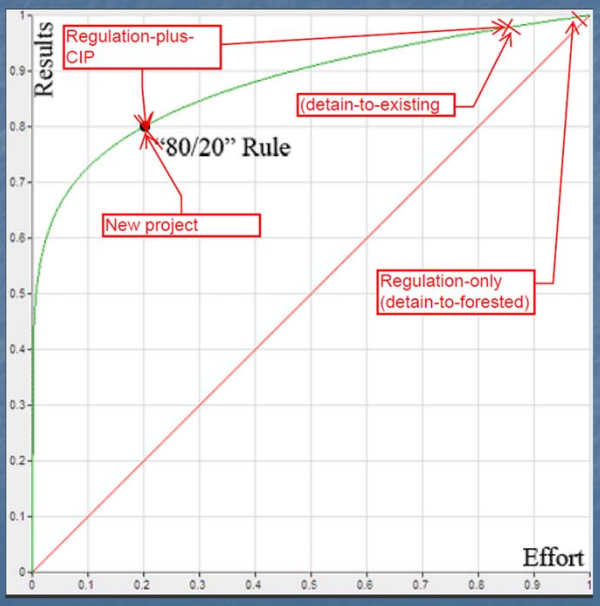
Prioritization Factor	Criteria	Rationale	Point Weighting
Stage 1: ***GIS Screen***			
Large, frequently traveled highways	Traffic level >30,000 annual average daily traffic (AADT).	For a variety of reasons, larger, frequently traveled highways are associated with greater pollutant generating potential.	1
Drinking water supply source	Mapped wellhead protection zones, sole sources aquifers, and drinking water source-protected watersheds.	Protect drinking water supplies.	2
Fish bearing streams	Waters identified by the Department of Fish and Wildlife as *fish bearing.*	Protect fish resources.	2
Summer spawning areas	Waters identified in state water quality standards as summer spawning areas.	Spawning areas and summer holding and migration areas provide critically important habitat for summer chum and summer steelhead.	2
Small streams	Waters with mean annual flows less than 20 cubic feet per second (i.e., waters that are not shorelines of the state)	Small streams are less able to assimilate runoff and more vulnerable to changes in flow.	3
High quality surface receiving waters	Waters identified in State water quality standards as *Char* and *Core salmon spawning and rearing.*	High quality streams provide important habitat	3
Urban fringe	Urban fringe areas within designated *Urban Growth Areas.*	More economical to retrofit prior to development which significantly reduces stormwater management options and increases capital and operational costs.	3
Stage 2: ***Reconnaissance***			
Untreated closed, curbed, and/or impervious-lined conveyance systems	Untreated runoff primarily conveyed by curbs, culverts, impervious-lined conveyances, and/or pipes to a receiving water body.	Closed, curbed, and impervious-lined conveyance systems have greater pollutant discharge potential than open drainage systems which have treatment and flow attenuation properties.	2
WSDOT observed erosion, pollution, or flooding problems	Eroded channels, embankments, excess sediment buildup/loading in stormwater infrastructure, visual observation of water pollution, or flood prone areas.	Gives consideration for known problems.	2
Discharges to 303(d) listed water bodies for certain pollutants of concern	303(d) listed water bodies for: PAH, metals (zinc and copper), turbidity, and herbicides used by WSDOT.	Gives consideration to known receiving water problems that could be exacerbated by discharges of untreated highway runoff.	2
Locally identified erosion, pollution, or flooding problems	Consult local basin plans, recovery plans, and associated TMDL implementation documents for identified stormwater runoff-related problems and/or retrofit priorities.	Factors in well-informed local knowledge.	3
Habitat suitability and value	Waters identified by the WDFW area habitat and Tribal biologist as important small stream habitat as well as highway segments with fish passages identified by WSDOT as high retrofit priorities.	Factors in well-informed local knowledge.	3
Stage 3: ***Detail Site Assessment***			
Stage 2 synthesis	Highway segments receiving a *Stage 2 Reconnaissance* score of 8 to 12.	Gives higher priority to factors evaluated in Stage 2.	1
Large highway drainage area	Draining area > 5 acres of impervious surface.	Larger drainage areas generate more runoff.	1

CLARK COUNTY WATERSHED MANAGEMENT:

Comparison of "Regulation-only" vs. county's "Regulation plus CIP" watershed management strategy

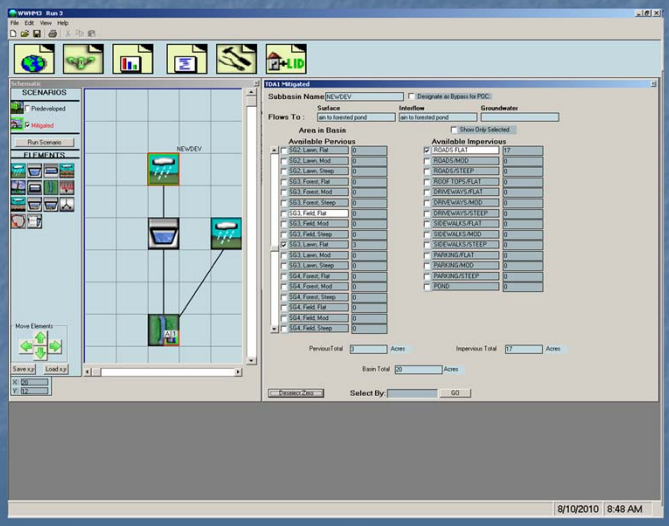
•Clark County's "Regulations plus CIP" watershed management strategy will allow many previous watershed proposals to be set in motion

"REGULATION–ONLY" VS. "REGULATION PLUS CIP"



- This graph shows the well-known "80-20" rule or "Pareto Principle"
- Two efficient detention ponds ("Regulation-plus-CIP" alternative) can be built for the same cost (effort) as a single highly-efficient detention pond ("Regulation-only" alternative)
- The next slides show how this can be expressed in the hydrologic modeling used to compare two watershed-rehabilitation alternatives

"REGULATION–ONLY" VS. "REGULATION PLUS CIP"
a. "Regulation-only"



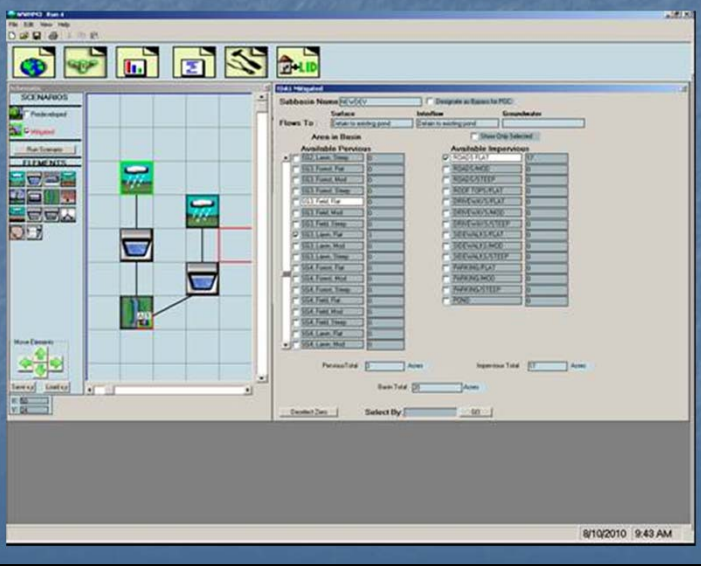
•This shows a 20 acre New Development (Industrial) with a stormwater facility providing flow control to the *forested* condition. This requires an 11.69 acre-foot detention pond.

•There is an adjacent existing, older 20 acre industrial development with no flow control

•Both developments combine downstream in an existing channel reach

•**We are interested in the effects on this reach of different watershed management strategies** – "Regulation-only" (this slide) vs "Regulation plus CIP" (County strategy – next slide)

"REGULATION–ONLY" VS. "REGULATION PLUS CIP"
b. "Regulation plus CIP"

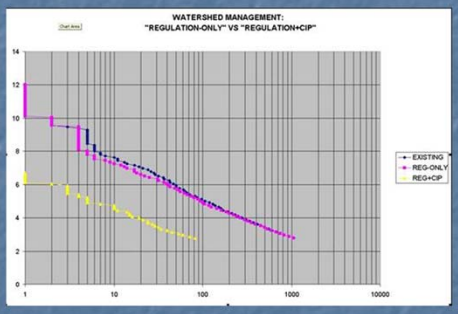


•This shows a 20 acre New Development (Industrial) with a stormwater facility providing flow control to the *existing* condition (Pasture). This requires an 8.08 acre-foot pond

•A new county CIP project also provides an additional (11.69-8.08=) 3.61 acre-foot pond downstream of the adjacent older, un-controlled development

•Both developments combine downstream in the same existing channel reach

"REGULATION–ONLY" VS. "REGULATION PLUS CIP"
Results:



FLOW-DURATION FLOW-FREQUENCY

•These graphs, taken from WWHM output, show conditions in the receiving stream reach for both watershed management strategy alternatives

•Both Flow-duration and Flow-Frequency are much better with the "Regulation plus CIP" watershed management strategy (yellow curves)

•"Two projects are better than one"

The county has several options when considering the CIP project portion of the strategy:

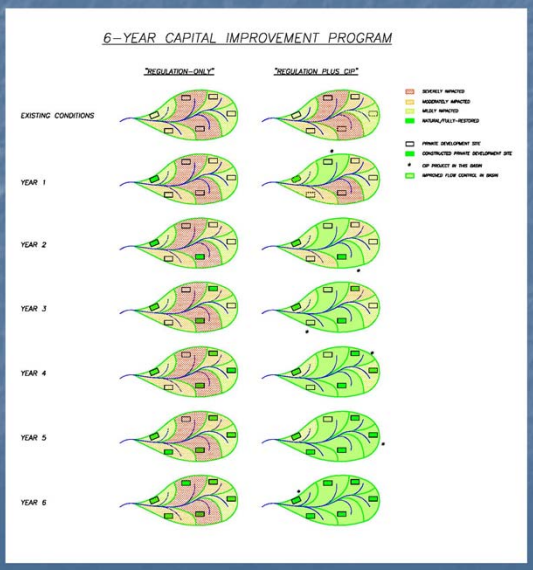
•place the facility in a different, more impacted basin where it is more needed

•Place the facility where it would be more effective – e.g. where an infiltration or retention facility could be built

•Place the facility in the same basin, if the need was critical

The next graphic describes in basic terms the general approach for a 6-year CIP set up to achieve the above benefits

"REGULATION–ONLY" VS. "REGULATION PLUS CIP"
6 year CIP period



This graphic applies the same approaches to a 6-year cycle of new development, to assess the effectiveness of both strategies over time

•"Regulation-only" - build one new 20 acre industrial development each year. Detain to forested conditions. No CIP

•"Regulation plus CIP" – county strategy – same new development construction except flow control is to Existing (pasture) condition and one new CIP project is built every year (*), in the most priority basin at that time

•Need to know the watershed priorities and the most effective retrofit project type to select good CIP projects; (e.g. use county's "SNAP" process plus "Infiltration Zone" mapping, watershed plans where available, etc.)

•*"Regulation plus CIP" is a more successful program in restoring watersheds* (more green after 6 years)

•This would be expected to have additional benefits in restoring endangered salmon runs, etc., so is advantageous for salmon recovery; this better meets WDFWL and NOAA Fisheries objectives than straight application of DOE's flow control standards

"REGULATION–ONLY" VS. "REGULATION PLUS CIP"
Reasons for improved performance

- The recent increases in stormwater detention volumes are used to make flow control improvements in key, targeted watershed locations rather than randomly (i.e. wherever new development occurs)
- The *differential* detention volume produces only marginally improved flow control for the "regulation-only" alternative("80-20 rule", "pareto principle"); those same storage volumes are utilized more often and more effectively when included in targeted watershed improvement projects
- The WWHM model set up and "passing" criteria is fairly conservative; because of this, facilities designed to "match" existing peak flow and duration may actually produce a significant improvement over existing flow conditions over much of the stream's hydrologic regime. This allows the county's approach to make significant flow control improvements in two stream locations rather than one
- By developing Infiltration Zone mapping, and emphasizing an infiltration-retention-detention hierarchy for stormwater runoff, the county's selected projects can provide better flow control than a similarly sized project in many new development locations
- In marginal infiltration areas, but where flood risks are shown to be minimal, *public* projects that utilize infiltration or retention of stormwater runoff can be built; a regulation-only approach would require the use of detention ponds for private developments in those same locations.
- A "regulation-only" approach may be unnecessarily over-controlling flows releasing to stream channels that have already adjusted over a long period to a pasture condition; this is common in much of the agricultural area of Clark County.

"REGULATION–ONLY" VS. "REGULATION PLUS CIP"
Additional Environmental Benefits

The following additional benefits may also result from sustained use of the county's watershed management strategy over time:

- Significant watershed improvements are constructed concurrently with new development
- In addition to improved flow control, the county's strategy provides significant additional watershed and environmental benefits
- The county's offsite flow control mitigation projects can include additional *water quality* treatment components at little additional cost
- The development of "multi-use" projects, and cost-sharing between county departments can leverage Stormwater CIP funds to improve the cost-effectiveness of the Stormwater CIP still further
- The county's holistic watershed management approach improves the "sustainability" of the county's water resources and natural resources
- The cost-effectiveness of the county strategy also improves the *economic* sustainability of the county's water resources, salmon-recovery, and environmental programs.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

APR 2 8 2016

OFFICE OF
WATER AND WATERSHEDS

Dear Ecology Municipal Permit Program:

The purpose of this letter is to provide the Environmental Protection Agency's comments on Ecology's March 2016 Stormwater Control Transfer Program 2nd draft guidance. The EPA appreciates and supports changes incorporated into the 2nd draft guidance, including limiting the program to flow control and specifying that Ecology will use administrative orders for approval of local transfer programs. As noted in our comments on the first draft guidance, the EPA supports testing of stormwater control transfer programs and believes, if done correctly, the program can accelerate environmental improvements in priority watersheds while ensuring all watersheds have ongoing improvement from re-development.

As noted in our previous comment letter, the EPA believes the program should also include the specific identification of sending watersheds. The guidance specifies the identification of receiving watersheds and would allow all other watersheds within the jurisdiction to serve as sending watersheds. The EPA is concerned that the current approach is too broad for the sending watersheds due to concerns that a significant amount of land would have deferred flow control improvements from re-development. The EPA recommends sending watersheds be those targeted for growth, especially high density urban development that have urban streams with relatively low restoration value. Thus, the program would have both receiving and sending watersheds, as well as watersheds where no transfers would take place. Designing the program in this way would align better with the complementary Building Cities in the Rain guidance, minimize concerns of deferred environmental benefit from sending projects, and maximize economic and environmental value of future stormwater investments associated with re-development. The EPA also notes that by retaining the treatment and LID requirements in sending areas, re-development in these urban growth areas will contribute to improved water quality.

The EPA also continues to be concerned about the use of state and federal stormwater retrofit grant funds to support local stormwater transfer programs. If a grant flow-control project is allowed to serve as a credit for a re-development project via a "fee-in-lieu" program, this will result in delayed environmental improvement because absent the transfer program the environmental improvement would occur when the grant project is built and when the re-development project occurs. Under the credit and "fee-in-lieu" program, the environmental benefit associated with a re-development project would occur later in time when the jurisdiction has gathered sufficient fees to build a 2nd flow control project. Thus, in general, the EPA believes grant funded projects should not be allowed to serve as credits for a transfer program. However, to help jump start a transfer program, it could be reasonable to allow the "fee-in-lieu" program to pay back the local match of a grant funded project to serve as local match for a future grant project. Lastly, flow control improvements associated with a transfer program must be independent of flow control improvements associated with the jurisdiction's structural control program requirements under the municipal stormwater permit.

Thank you for the opportunity to provide comments on the 2nd draft guidance. If you have any questions, please contact John Palmer in our office at (206) 553-6512.

Sincerely,

Christine Psyk, Associate Director
Office of Water and Watersheds

Gariepy, Dan (ECY)

From: Karen Walter <KWalter@muckleshoot.nsn.us>
Sent: Friday, April 29, 2016 2:20 PM
To: ECY RE Stormwater Permit Comments (WQ)
Subject: Ecology's Stormwater Transfer Control program

To Whom It May Concern,

We have reviewed Ecology's 2nd Draft for the proposed Stormwater Transfer Control Program. We appreciate the review opportunity for this important issue. It appears that the majority of our comments submmited July 15, 2015 (shown in the comments section) have been included in this second draft. We appreciate Ecology's careful consideraiton and inclusion of these comments.

We respect to Ecology's review and approval process authorizing stormwater transfer programs under the Stormwater Transfer Guidance and Adminstrative Orders, the Muckleshoot Indian Tribe Fisheries Division requested to be added to the notification list. Please use the contact information below for this purpose.

Thank you,
Karen Walter
Watersheds and Land Use Team Leader

Muckleshoot Indian Tribe Fisheries Division Habitat Program
39015 172nd Ave SE
Auburn, WA 98092
253-876-3116

City of Seattle
Seattle Public Utilities

April 29, 2016

Municipal Permit Comments
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

Re: Seattle Comments on Ecology's Proposed Stormwater Control Transfer Program

Thank you for the opportunity to comment on Ecology's second draft Stormwater Control Transfer Program Guidance Document, Publication No. 15-10-017 published March 2016. Seattle appreciates Ecology's consideration of Seattle's comments on the first draft on the out of the basin transfer program. Seattle's comments and recommendations on the second draft are provided in Attachment 1.

Please feel free to contact Sherell Ehlers of my staff if you have any questions regarding this letter. Sherell can be reached at (206) 386-4576 or at Sherell.Ehlers@Seattle.gov.

Sincerely,

Ben Marré, P.E.
Planning & Program Management Division Director
Seattle Public Utilities

cc: Kevin Buckley, SPU
Kate Rhoads, SPU
Sherell Ehlers, SPU
Theresa Wagner, Seattle City Attorney's Office

Ray Hoffman, Director
Seattle Public Utilities
700 5th Avenue, Suite 4900
PO Box 34018
Seattle, WA 98124-4018

Tel (206) 684-5851
Fax (206) 684-4631
TDD (206) 233-7241
ray.hoffman@seattle.gov

http://www.seattle.gov/util

Comment #	Page #	Section	Comment	Suggested Edit
1.	Overall	Overall	Seattle supports Ecology's decision to limit the guidance scope to flow control.	None.
2.	1	Guidance Overview	Seattle agrees with Ecology that the Stormwater Control Transfer program draft guidance does not apply to in-watershed transfers. However, Seattle recommends further clarifying this through the following: The Guidance document should clarify that the guidance applies only to out-of-basin transfers. Because the main focus of the guidance document is on out-of-basin transfer, guidance on in-basin transfer may confuse users. Seattle suggests that Ecology remove Attachment 1 from the document to avoid confusion as Attachment 1 and the related definition (comment below) go beyond the intended scope, for example assuming "capacity credits" for in-basin transfer.	Revision: The focus of the body of this document is out-of-basin transfers. Refer to Appendix 1 of the Phase I and II Municipal Stormwater Permits for ~~Attachment 1 of this document provides a summary of~~ requirements and guidance for in-basin transfers of stormwater facilities. ~~In-basin transfers refer to the construction of stormwater facilities that discharge to the same receiving water as the development project site.~~
3.	29	Overall Guidance / Glossary	"Predeveloped condition" definition differs from, oversimplifies and perhaps misstates regulatory language in MS4 Permit App. 1 at 4.7 and Ecology Manual at Vol. I, 2.5.7. It also does not match the Manual definition. It is confusing for key terms used elsewhere to regulate permittees to be defined or redefined in guidance.	Delete definition and move any guidance-specific explanation to the body of guidance.
4.	29	Overall Guidance / Glossary	"Pre-project condition" differs from, oversimplifies and perhaps misstates regulatory language in MS4 Permit App. 1 at 4.7 and Ecology Manual at Vol. I, 2.5.7. See footnote to each. There is no Manual definition. It is confusing for key terms used elsewhere to regulate permittees to be defined for the first time in guidance.	Delete definition and move any guidance-specific explanation to the body of guidance.

Comment #	Page #	Section	Comment	Suggested Edit
5.	Various	Overall Guidance	The guidance is inconsistent using the following terms: "pre-project condition" vs. "pre-project land cover"; "pre-developed condition" vs. "pre-developed land cover". The definitions of "pre-project condition" and "pre-developed condition" both include "land cover" in the definitions. Therefore it is confusing to use "land cover" and "land cover condition" throughout the document.	Use "pre-project condition" and "pre-developed condition" throughout the document.
6.	1	Footnote 2	Typo in footnote.	2 For the 2013-18 permit cycle, Ecology intends to use its Administrative Order authority to approve individual Permittee proposals to establish a Stormwater Control Transfer Program. Actions taken ~~though~~ through Administrative Orders are appealable by municipalities and third parties. Any parties interested in being notified of Administrative Orders approving transfer programs can contact Ecology to be added to a notification list.
7.	3	Footnote 6	As noted above, guidance should clarify that it applies only to out-of-basin transfers. Because the guidance focusses on out-of-basin transfer, it is not the place to create or expand guidance on in-basin transfer.	Delete "the body of" and "See Attachment 1." Refer to Appendix 1 of the Phase I and II Municipal Stormwater Permits for in-basin transfers.
8.	4	Specific Technical Guidelines for Flow Control Improvement Transfers	Consider breaking item #6 into two points as they pertain to two different guidelines.	6. Where regional facilities in a high priority watershed will serve to provide capacity credits for purchase, it should be designed for future build-out of the area draining to it, whenever possible, so that it can fully meet the needs of its drainage area. 7. When a regional facility…

Comment #	Page #	Section	Comment	Suggested Edit
9.	4	Specific Technical Guidelines for Flow Control Improvement Transfers	The last sentence in item #6 is referring to in-basin transfers and is not applicable to this guidance document. Restructure this sentence to only apply to out of the basin transfers.	Consider: 7. When a regional facility has exhausted its capacity credits, additional transfers to the regional facility shall not be allowed for projects within the basin or out of the basin. ~~redevelopment projects within its drainage area that increase impervious area must either: 1) meet its flow control requirements on-site; 2) transfer its flow control improvements to another flow control facility site within the high priority watershed; or 3) transfer its flow control improvements to another high priority watershed.~~
10.	6	Table 2	Table 2 is for scenarios when a forested pre-developed condition is required.	Consider adding a footnote that explains that Table 2 applies to projects that are required to meet a forested pre-developed condition (and not a pasture or existing pre-developed condition).
11.	6	Table 2, Forested Pre-Project Land Cover	Consider text change to be clear that if existing pre-project condition is forested, then transfer is not allowed.	Project Site: Impervious to Forested Transfer site: No additional Improvements (transfer not allowed)
12.	8	Steps 1 – 4	The headings in Steps 1 – 4 do not match the table headings on pages 9 – 15.	E.g.: Page 8: Step 1: Fish Use and Aquatic Habitat Page 10: Step 1: Fish Use and Aquatic Conditions
13.	9	Prioritization Analysis Support	The title for the tables on 9 – 15 still references LID & Runoff Treatment. Also, should this title instead refer to "Watershed Prioritization" instead of Flow Control?	Recommended Local ~~Prioritization~~ Data for Watershed Prioritization ~~Flow Control, Low Impact Development and Runoff Treatment~~
14.	11	Prioritization Analysis Support	Step 2 still references LID and Runoff Treatment	Step 2: Flow Control~~, LID and Runoff Treatment~~ Opportunity Assessment

Comment #	Page #	Section	Comment	Suggested Edit
15.	17	Monitoring (Section III: Considerations for Developing an Effectiveness Monitoring Plan for Stormwater Control Transfer program)	Seattle suggests that Ecology restate its reference to the PCHB decision by quoting the decision. The PCHB has not considered stormwater control transfer approaches in general, but instead ruled on one particular alternative program, which it found lacking on several grounds under Special Condition S.5.C.5.b.ii.	The Washington State Pollution Control Hearings Board ruled (PCHB No. 10-013) that ~~a monitoring program is necessary to confirm the equivalency of a stormwater control transfer approach concerning compliance with default stormwater management requirements in~~ "alternative mechanisms … must be based in science and have some assurances that beneficial uses will have at least the same level of protection as provided by" the Phase I Municipal Stormwater Permit. Ecology supports the concept of establishing a monitoring program as one way to document effectiveness of a Stormwater Control Transfer Program in improving water quality and /or quantity conditions in a targeted, priority watershed and offers the following guidance for establishing such a program.
16.	19	Table 3: 3.3 acres Pasture Pre-Project Land Cover	Reference "Pasture" for Project Site and note change from "Forest" to "Forested".	Project Site: 3.3 Acres Impervious to Pasture ~~Forested~~ Transfer site: 3.3 Acres Pasture to Forested
17.	19	Determining a Project's Stormwater Improvement Transfer Obligation	For clarity, consider adding a reference to the example in Table 3 per suggested edit.	For the example in Table 3, The Stormwater Control Transfer Program allows the proponent to construct flow control facilities or purchase available capacity in an existing facility in a high priority watershed that serves a contributing area with at least: • 3.3 acres of Pasture • 1.0 acres of Lawn/Landscape • 0.2 acres of Effective Impervious Area

Comment #	Page #	Section	Comment	Suggested Edit
18.	20	Table 4: Project Transfer Obligation Table, Section 1	Section 1 assumes that all projects are required to match the pre-developed condition of forested land cover. Some projects are allowed to meet the pre-developed condition of Pasture or existing land cover. Instead of tracking surface to Forest Debit, the Project Transfer Obligation Table should include one line that identifies the pre-developed condition the project is required to meet.	Required pre-developed condition to be matched (check one): ☐Forested ☐ Pasture ☐ Existing Land Cover 1.~~Stormwater~~ Flow Control Improvement Requirements Transferred to Facility in High Priority Watershed a. Impervious Surface Area ~~to Forest Debit~~ b. Other Hard Surface Area ~~to Forest Debit~~ c. Lawn/landscape Area ~~to Forest Debit~~ d. Pasture Area ~~to Forest Debit~~
19.	20	Table 4: Project Transfer Obligation Table	Typo.	Section 4, should be labeled "3".
20.	27-28	Att. 1	Guidance should clarify that it applies only to out-of-basin transfers. Because the guidance focusses on out-of-basin transfer, it is not the place to create or expand guidance on in-basin transfer. Att. 1 and the related definition (comment below) go beyond the intended scope, for example assuming "capacity credits" for in-basin transfer.	Delete Att. 1 and clarify that the guidance only addresses out-of-basin transfer.
21.	29	Glossary	See above	Delete "In-basin transfer" definition.

City of Tacoma Comments on March 2016 Draft of Stormwater Control Program – Out of Basin

General

1. Define watershed as used in the context of this document. It appears in the context of this document that watershed is defined as the contributing basin to a single receiving waterbody and could include several outfalls and discharge locations.

2. The 1st draft of the Stormwater Transfer Program included discussion of Minimum Requirements #5 – Onsite Stormwater Management and Minimum Requirement #6 – Water Quality. The 2nd Draft appears to only apply to Minimum Requirement #7 – Flow Control. Is this meant to imply that Ecology will not approve Out of Basin Transfers for onsite stormwater management BMPs or water quality treatment BMPs? The City of Tacoma believes there are benefits to including water quality as part of this program.

Guidance Overview – Page 1

3. Define receiving water.

Key Stormwater Control Transfer Program Elements - Page 4

4. Item #6 states, "The Permittee shall provide annual reports to Ecology documenting flow control capacity used and available in offsite facilities associated with this program." What is Ecology going to do with this information? The Permittee will have this information available, it is unclear why the information needs to be supplied to Ecology in an annual report.

Specific Technical Guidance for Flow Control Improvement Transfers – Page 4

5. Item #2 – consider adding the words "like for like" to clarify this sentence.

6. Item #6 states, "Where regional facilities in a high priority watershed will serve to provide capacity credits for purchase, it should be designed for future build-out of the area draining to it, whenever possible, so that it can fully meet the needs of the drainage area." In urban settings it is unlikely that a regional facility can be designed for future build-out. The addition of this language may discourage the design of regional facilities. The City recommends removing this sentence.

7. Item #6 states, "When a regional facility has exhausted its capacity credits, redevelopment projects within its drainage area…" Should the statement say new and redevelopment projects?

Table 2 – Page 6

8. This table is confusing and should be removed or thoroughly clarified. Include definitions for project site and transfer site. It is recommended to describe pre-project as "pre-project (existing) land cover. If this table remains, below is recommended language.

Pre-Project (Existing) Land Cover	Post-Project Land Cover	Flow Control Requirements
Forested	New Impervious	Project Site: Provide onsite flow control BMPs to match

		predeveloped (forested) conditions. Flow Control Improvement Transfer: Not Allowed
Lawn/Landscaped	New Impervious	Project Site: Provide onsite flow control BMPs to match pre-project (lawn/landscaped) conditions. Flow Control Improvement Transfer: Transfer flow control improvements to match pre-project (lawn/landscaped) flow durations to predeveloped (forested) flow durations.

Prioritization Analysis Support

9. The first sentence states, "As a first step…, a Permittee must articulate a clear prioritization goal/focus…" It appears that Ecology has already stated (page 3) the goal of the program to be to "Reduce the duration and frequency of high stream flows..."

10. Under Step 4, provide additional guidance on what "actively seek input" means, for example, what is the obligation, who are the contacts, how long do Permittees have to wait for response. As written, this could be interpreted differently amongst jurisdictions.

Page 9

11. Should Table be relabeled to just address Minimum Requirement #7?

Page 12

12. Under Data Sources, in the notes section should the reference to runoff treatment transfers be removed?

Page 13

13. Remove reference to stormwater management treatment.

14. What does "ripeness to proceed" mean?

Background – Page 17

15. Remove water quality from the last sentence.

16. Monitoring guidance is inconsistent and may not provide data that is useful to every Stormwater Transfer Program. Remove paragraphs two through four and replace with more generic language such as: "A monitoring plan shall be developed to measure the effectiveness of the Stormwater Control Transfer Program. The Permittee shall develop a monitoring plan

appropriate for the Program and submit the monitoring plan to Ecology for review and approval."

Determining a Project's Stormwater Improvement Transfer Obligation – Page 18

17. The NOTE is confusing. Does the note mean that if the project were historic prairie prior to settlement that the project would also not be able to participate in the program? If this is the case, the language should be rewritten as follows: "Projects that convert a forested land cover or historic prairie to any other…"

18. After note, create a new header for the example and consider putting the whole example alone on one page.

Table 3 – Page 19

19. The example provided would not be considered redevelopment under the Phase I NPDES Municipal Stormwater Permit. The example would be considered new development because the existing lot has less than 35% existing hard surface coverage. It is recommended to include a diagram to show a scenario. See below for suggested updates to table:

Table 3: Example Project		
Pre-Project (Existing) Land Cover	Post-~~Developed~~ Project Land Cover	Flow Control Requirement(s) ~~to be added as part of the Development Project~~
0.5 acres Forested	0.5 acres New Impervious	Project Site: Provide onsite flow control BMPs to match post-project (0.5 acres impervious) to pre-project (0.5 Acres Forested) ~~Impervious to Forested~~ conditions. ~~Transfer Site~~ Flow Control Improvement Transfer: ~~No Additional Improvements (transfer not allowed)~~ Not Allowed.
3.3 acres Pasture	3.3 acres New Impervious	Project Site: Provide onsite flow control BMPs to match post-project (3.3 acres impervious) to pre-project (3.3 acres pasture) conditions. ~~Acres Impervious to Forested~~ Flow Control Improvement Transfer ~~Site~~: Transfer flow

		control improvements to match pre-project (3.3 acres pasture) flow durations to predeveloped (3.3 acres forested) flow durations. ~~3.3 Acres Pasture to Forest~~
1.0 acre Lawn/Landscape	1.0 acre New Impervious	Project site: Provide onsite flow control BMPs to match post-project (1.0 acres impervious) to pre-project (1.0 acres lawn/landscape) conditions. ~~1.0 acre Impervious to lawn/landscape~~ Flow Control Improvement Transfer ~~site~~: Transfer flow control improvements to match pre-project (1.0 acre lawn/landscape) flow durations to predeveloped (1.0 acres forested) flow durations. ~~1.0 acre lawn/landscape to forested~~
0.2 Effective Impervious	0.2 Replaced Impervious	Project site: ~~No Additional Improvements~~ Not Allowed. Flow Control Improvement Transfer ~~site~~: Transfer flow control improvements to match pre-project (0.2 acre impervious) flow durations to predeveloped (0.2 acres forested) flow durations. ~~0.2 acre Impervious to forested~~

Table 4 – Page 20

20. The number 4 should be changed to 3.
21. Define the “debit” concept.
22. It does not appear that the Notes would apply in every scenario, please clarify.
23. In the table, consider using the same terminology as used throughout the document text.

Allowable Regional and Equivalent Facilities – Page 22

24. The term retention basin is no longer used in Ecology’s SWMMWW. Consider revising to use common terminology amongst guidance documents.

Calculating Net Capacity (in terms of acreage) of Regional or Equivalent Facilities in Priority Watersheds – Page 30

25. The term retention basin is no longer used in Ecology's SWMMWW. Consider revising to use common terminology amongst guidance documents

26. Facilities with a flow splitter can still provide hydrologic benefits to the receiving waterbody. Permittees should be allowed to justify to Ecology why a flow splitter is required and the benefit of the facility with the flow splitter.

Step A2 – Page 24

27. "do not modified" should read "do not modify".

Step A4 – Page 24

28. "do not modified" should read "do not modify".

Paragraph C – Page 22

29. Remove the sentence: "In this case, it may only be necessary to create a Table 4…" It is unnecessary and inclusion of the language may create confusion.

Reforestation – Page 26

30. It is stated, "Existing native vegetation areas that have the potential to be developed cannot be used for this reforestation credit." This appears to imply that those existing native vegetation areas that cannot be developed might be eligible for the program though this concept is not referenced in the document. If this is the case, please include language concerning existing vegetation areas that cannot be developed as potential sites for the program.

Gariepy, Dan (ECY)

From: Ratcliff, Jana <RatcliJ@wsdot.wa.gov>
Sent: Thursday, April 28, 2016 10:48 AM
To: ECY RE Stormwater Permit Comments (WQ)
Cc: Nguyen, Alex
Subject: WSDOT Comments on Stormwater Control Transfer Program Document

Good Morning,
Thank you for the opportunity to review and provide comments on the second draft of Ecology's *Stormwater Control Transfer Program* document. Alex Nguyen, WSDOT's Highway Runoff Program Manager, and I reviewed the document and have two minor comments:

1) Page 19, *Table 3: Example Project to demonstrate how and where Flow Control Requirements are met in a Stormwater Transfer Program:* There appears to be a typo in the third column. "Project Site: 3.3 Acres Impervious to Forested," should say, "Project Site: 3.3 Acres Impervious to Pasture."
2) Page 20, *Table 4: Project Transfer Obligation Table*: Table appears to be missing item #3. The "Notes" reference "3a" and "3b".

Please let me know if you need/would prefer WSDOT submit these comments in a formal letter.

Thank you,
Jana

Jana Ratcliff
Municipal Stormwater Permit Coordinator
Environmental Services Office
Washington State Department of Transportation
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