



Department of Commerce

Building Cities in the Rain

Watershed Prioritization for
Stormwater Retrofits

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EXECUTIVE SUMMARY

Building Cities in the Rain

Targeted watershed recovery and urban redevelopment and revitalization go hand in hand. This guidance describes an optional process for prioritizing watersheds for stormwater retrofits¹ and the recovery of aquatic habitat in urban areas. 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. The City sees this as contrary to the intent of the Growth Management Act to densify these urban areas. The City believes there is a conflict between the requirements of the Growth Management Act and the National Pollutant Discharge Elimination System (NPDES).

Seeking to avoid site-by-site facilities that consume land designated as Regional Growth Centers², 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 rehabilitation efforts that will

¹ For purposes of this guidance document, the term “stormwater retrofit” or “retrofit” refers to an improvement in stormwater management that treats stormwater runoff or controls stormwater flow for an existing or redeveloped surface that was not previously receiving that level of runoff treatment or flow control. A “redeveloped surface” means a surface that will require the same or more stormwater runoff treatment or flow control to meet the NPDES Minimum Requirements. This improvement in stormwater management can sometimes be transferred through an Ecology approved plan. Some retrofits are installed as part of the structural stormwater controls obligations under the Phase 1 NPDES Municipal Permit. See Appendix A, Definitions.

² 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.

support aquatic habitat for salmon. The Citywide Watershed Management Plan, approved by Ecology, allows the City to transfer certain stormwater control improvements from development sites and into areas that drain to water bodies targeted for recovery.

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. The predicted annual rate of mitigation of new and redevelopment in Puget Sound is 1.6 percent over a 30-year period³. At this rate, it will take more than 60 years to fully retrofit all watersheds for stormwater management in the Puget Sound region, and for any urbanized water body 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.

There is not enough funding to construct stormwater facilities in areas developed with impervious surface⁴ in all watersheds in the immediate future⁵. 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 leverage all available funds in watersheds with the most opportunity for restoring healthy aquatic habitat.

Uses for Prioritization

The prioritization described in this report can currently provide environmental benefits in a number of different contexts, such as:

- Informing elected officials and the general public of environmental assets in their community, and the current condition of those assets.
- 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 stormwater control program required under the Phase I permit, S5.C.6;

³ [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.

⁴ For example, pavement and roofs.

⁵ 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.

- Prioritizing project proposals for a grant from the Ecology Stormwater Financial Assistance Program to address pollution caused by existing development;
- Informing water clean-up plans (Total Maximum Daily Load); or
- Establishing a stormwater control transfer program that targets high-priority watersheds for transfer of stormwater retrofits from watersheds where local comprehensive plans encourage redevelopment and urban infill.⁶

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

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 can provide a tool for targeting the location of and investment in improved stormwater controls, including regional detention facilities⁸. In 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 the current approach of developer-funded 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. Prioritization would allow cities and counties to put their efforts into high-priority areas. Facilitating redevelopment in urban centers already 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 impacts and restoring salmon habitat. Salmon recovery plans do not address the stormwater impacts from development that degrade salmon habitat in urbanized areas. Building stormwater retrofits that leverage habitat restoration projects also increase the likelihood that salmonids will survive in urban water bodies.

⁶ See Appendix C, Stormwater Control Transfer Program, and Subsection 3.1.4 on page 13.

⁷ Ibid 6.

⁸ 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.

Process and Data Sources for Watershed 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 Chinook Salmon Recovery, 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.

CHAPTER 1:

Introduction

1.1 Purpose of this Watershed 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 investment in stormwater management projects. The intent is to protect and restore receiving waters or receiving waterbodies⁹ within those watersheds. Prioritized watersheds will be important to protecting salmonids and other beneficial uses, and are expected to respond to stormwater retrofits. This guidance provides focused recommendations for western Washington State municipal stormwater permittees with designated regional growth centers¹⁰ under the Puget Sound Regional Council's VISION 2040. 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 in developed areas 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 stormwater control 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;
- Inform water clean up plans (Total Maximum Daily Load); or
- Establish a stormwater control transfer program that targets high-priority watersheds for transfer of stormwater flow controls from watersheds where development is encouraged under local comprehensive plans.¹¹

This watershed prioritization guidance can be used on its own for prioritizing receiving waterbodies for voluntary stormwater 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 centers¹².

⁹ A receiving waterbody or receiving waters are the waters to which a specific geographic area (or, watershed) drain See Appendix A, Definitions.

¹⁰ 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.

¹¹ See Appendix C, Stormwater Control Transfer Program, and Subsection 3.1.4 on page 13.

¹² Ibid, 11.

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 retrofitting will be based on market forces and not on the value or threat to water quality. The predicted annual rate of mitigation of new and redevelopment in Puget Sound is 1.6 percent over a 30-year period¹³. At this rate, it will take more than 60 years to fully retrofit all watersheds for stormwater management in the Puget Sound region. It is important to note that Chinook salmon and other salmon species are listed as threatened by extinction in western Washington. Providing habitat incrementally over the next 60 years from now will not be sufficient to recover these iconic species.

There is not enough funding to reduce stormwater impacts in all receiving waterbodies in the immediate future¹⁴. 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 facilities¹⁵. It also 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.

¹³ [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.

¹⁴ 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.

¹⁵ 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.

1.3 The Redmond Experience

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 permits and regulations), 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.¹⁶

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.

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 capacity¹⁷. A watershed 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 retrofit projects to be included in the Capital Facilities Plan.

1.4 Background of the Building Cities in the Rain Project¹⁸

The Puget Sound Regional Council's Growth Management Policy Board at its May, June and July 2013 meetings heard presentations¹⁹ from the Cities of Tacoma and

¹⁶ [City of Redmond Watershed Management Plan](#), page xiii.

¹⁷ 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."

¹⁸ For more information and materials on how this guidance was developed, go to the [project web site](#).

¹⁹ The presentations are posted on the PSRC Growth Management Policy Board's [meetings web site](#).

Redmond, the Departments of Ecology and Commerce, and the Puget Sound Partnership.

In Redmond's case, millions had been spent on regional facilities to equip Redmond's two regional growth centers with stormwater controls. The regional growth centers were designated to accommodate the density and targeted growth envisioned in Redmond's Comprehensive Plan under the Growth Management Act. This investment will achieve its purpose to accommodate the regional growth centers, and they will improve the health of the Sammamish River and Kelsey Creek, but the investment will not result in healthy aquatic habitat. In response, Redmond staff developed a watershed management plan that prioritized watersheds for rehabilitation efforts that will support aquatic habitat for salmon, allowing the city to develop a stormwater control transfer program that will assist the City in financing environmental improvement.

Tacoma's perspective is that the complexity of redevelopment, exacerbated by stormwater management requirements, paired with low rents and high vacancies, has driven development out of downtown Tacoma's regional growth center and into lower-density areas, creating urban sprawl that is contrary to the intent of the Growth Management Act.

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.²⁰

In response to the Growth Management Policy Board's discussion and the South Central LIO's interest in a more effective approach to 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*.²¹ With this funding, Commerce has researched the issue, provided technical assistance, and convened a work group of interested stakeholders to develop this guidance.

²⁰ 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".

²¹ Puget Sound 2014/2015 Action Agenda Sub-Strategies A 1.2 and 4.1.

As an early step in the Building Cities in the Rain process, 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 report²² 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 reduce 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 volunteer 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.²³

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 watershed prioritization of stormwater controls besides a stormwater transfer control program, such as a structural stormwater control 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.

²² The Background Report is posted on the Building Cities in the Rain [project web site](#).

²³ See Appendix B for the list of Work Group participants.

CHAPTER 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 prioritization of watersheds that facilitates development in regional growth centers under the Puget Sound Regional Council’s VISION 2040. For example, for purposes of a stormwater control transfer program, the Work Group agreed to emphasize the potential to transfer stormwater improvements from regional growth centers to priority watersheds to accelerate restoration of priority watersheds and to encourage growth in regional growth centers. 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](#)²⁴ are the hallmark of VISION 2040. VISION 2040 is a regional strategy for accommodating the 5,000,000 people expected to live in the Puget Sound 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 Act²⁵ 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 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.

²⁴ See Appendix D for a map of the regional growth centers and basins with 40% impervious cover since 1985 Near Flow Control Exempt Waters.

²⁵ RCW 36.70A.210(7).

CHAPTER 3:

Multiple Community and Regulatory Benefits and Opportunities

Prioritization of watersheds 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

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. Since its introduction in 1972, the NPDES permit program is responsible for significant improvements to our nation's water quality.²⁶ In Washington State, the NPDES permit program is administered by the Department of Ecology.

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.”²⁷

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

²⁶ [EPA NPDES web site.](#)

²⁷ See Appendix E for a list of the western Washington Phase I and II cities and counties.

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:

- Minimum Requirement #5, On-Site Stormwater Management²⁸ (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 Treatment²⁹ (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 Control³⁰ (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 Retrofits

As noted above, prioritization of watersheds for stormwater retrofits allows a jurisdiction to target stormwater 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 controls (see Appendix C and subsection c below).
- Targeting stormwater control investment under a structural stormwater control 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).

²⁸ Municipal Permits for Western Washington, Appendix 1, Section 4.5, Minimum Requirement #5, On-site Stormwater Management.

²⁹ Municipal Permits for Western Washington, Appendix 1, Section 4.6, Minimum Requirement #6, Runoff Treatment.

³⁰ Municipal Permits for Western Washington, Appendix 1, Section 4.7, Minimum Requirement #7, Flow Control.

3.1.3 Watershed Management Planning 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-approved basin plan or similar water quality and quantity planning effort³¹.

A permittee may establish a stormwater control transfer program³² 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 priority-receiving waterbodies or receiving waters without degrading lower-priority receiving waterbodies or receiving waters, while still meeting permit requirements.

3.1.4 Stormwater Control Transfer Programs

When used 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. As observed elsewhere, under the municipal permits, stormwater 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 addressed 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 facilities, while accelerating environmental improvement in other watersheds within a jurisdiction where they will create the most environmental benefit. If a regional growth center or an urban center has been designated in an area that drains to a high

³¹ See the following permit requirements (Phase I: S5.C.5.a.i , Phase II: S5.C.4.a.i).

³² See Appendix C for a description of a stormwater control transfer program.

functioning water body, developing a program to transfer stormwater controls from such areas would not be appropriate.

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 stormwater retrofit projects 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 Act³³ 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 cities³⁴ 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).³⁵ VISION 2040 contains the multi-county planning policies adopted by the Puget Sound Regional Council under the Growth Management Act.

Prioritization of watersheds for stormwater retrofit projects 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 2040.³⁶

³³ Chapter 36.70A RCW and related statutes.

³⁴ 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.

³⁵ RCW 36.70A.210(7).

³⁶ 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.

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.

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.”³⁷ 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 MS4³⁸. The Cities of Kirkland, Issaquah, Renton and Tacoma have adopted level of service standards for surface water management in their capital facilities elements³⁹.

Cities and counties must adopt a six- to 20-year plan of capital projects with estimated costs and proposed methods of financing⁴⁰ 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 watersheds 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 facilities⁴¹. 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 to

³⁷ RCW 36.70A.070(1).

³⁸ 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.

³⁹ 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-hour design storm for all public facilities and private facilities greater than or equal to 24 inches in diameter.

⁴⁰ RCW 36.70A.070(3).

⁴¹ 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.

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 transferring 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 stormwater 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.⁴²

⁴² See PSRC's [Regional Center Plans Checklist](#).

“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 stormwater retrofit projects in high-priority watersheds and/or a program to allow offsite transfers of certain stormwater controls. Mitigation measures would be predefined in the SEPA document for the subarea plan.⁴³

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 identified 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 2016 Action Agenda continues to call 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.⁴⁴

Prioritization of watersheds 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. Compact development can be facilitated by allowing a developer to pay a fee-in-lieu of constructing stormwater retrofit projects 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

⁴³ 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).

⁴⁴ Specifically, Ecosystem Strategy 4 states: “Encourage compact regional growth patterns and create dense, attractive, mixed-use, and transit-oriented communities.” Sub-strategy 4.1 states: “Provide infrastructure and incentives to accommodate new and re-development in urban growth areas.” (See page 36 of the [2016 Action Agenda Comprehensive Plan](#).)

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, [Watershed 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 watersheds for stormwater retrofits can facilitate salmon recovery by targeting watersheds with the most potential for restoration. Building stormwater facilities 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 centers helps 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 contributor⁴⁵. 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 percent⁴⁶. Smaller housing units increase energy efficiency, and smaller parcel sizes can reduce the thermal emissions that are attributable to large lots with larger houses, longer driveways and bigger yards⁴⁷.

Based on the scope of analyses King County performed as part of the Stormwater Retrofit Plan for Water Resources Inventory Area (WRIA) 9⁴⁸ 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

⁴⁵ See the [Washington State Greenhouse Gas Emissions Inventory, 2010 – 2011](#).

⁴⁶ [Creating Great Neighborhoods: Density in Your Community, Local Government Commission](#).

⁴⁷ 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).

⁴⁸ See [Development of a Stormwater Retrofit Plan for Water Resources Inventory Area \(WRIA\) 9: Comprehensive Needs and Cost Assessment and Extrapolation to Puget Sound](#), 2009.

standards to account for climate change impacts. This analysis will inform the next Stormwater Design Manual update, and will result in long-term savings in stormwater infrastructure investment.

Prioritization of receiving waterbodies for targeted stormwater investments can support related efforts for resiliency planning for climate change⁴⁹. Communities can plan for climate change impacts by ensuring new stormwater facilities have adequate flow control and water quality treatment⁵⁰.

3.6 Environmental Justice

Prioritizing watersheds for stormwater retrofit projects can include consideration of environmental justice⁵¹ and social equity issues in economically disadvantaged neighborhoods. These neighborhoods can benefit 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 stormwater retrofits can consider these neighborhoods for retrofit projects 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 systems⁵².

⁴⁹ See the [Washington State Integrated Climate Change Response Strategy](#), and [King County's Strategic Climate Action Plan](#), Section Two, page 112. Also see Appendix E, Resources, for other examples of planning for Climate Change.

⁵⁰ See Appendix G, Resources, for examples of community planning for climate change.

⁵¹ 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 and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

⁵² RCW 36.70A.020 and 070.

CHAPTER 4:

Prioritizing Watersheds for Stormwater Retrofit Investment

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. Actively 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.

This guidance lays out a stepwise approach to prioritizing watersheds for stormwater retrofit investment. 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. 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. The tribes and those agencies may have data or local knowledge pertinent to establishing priorities, and informed opinions about the relative importance of watersheds. As with any planning process, public input will also be a key step.

A stormwater control transfer program must be based on scientifically sound prioritization and will require approval from the Department of Ecology⁵³. Ecology will be looking for all of these components as it considers approval of the program.

⁵³ 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.

While Ecology approval will not be required for a prioritization program that does not include stormwater control transfers, Steps 1-5 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 retrofit investment. 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 Policy⁵⁴, the City of Kirkland's Comprehensive Plan Environment Element Surface Water policies⁵⁵, the City of Covington's Comprehensive Plan Natural Environment Element Water Resource Goal⁵⁶, and the City of Redmond's Natural Environment Element Policies⁵⁷.

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.

⁵⁴ 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.

⁵⁵ 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.

⁵⁶ 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.

⁵⁷ 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.

4.2 Process and Data for Prioritization of Watersheds

The data needed for a city or county to prioritize watersheds for stormwater retrofit investment should generally be relevant, available and easily accessible.⁵⁸ 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.

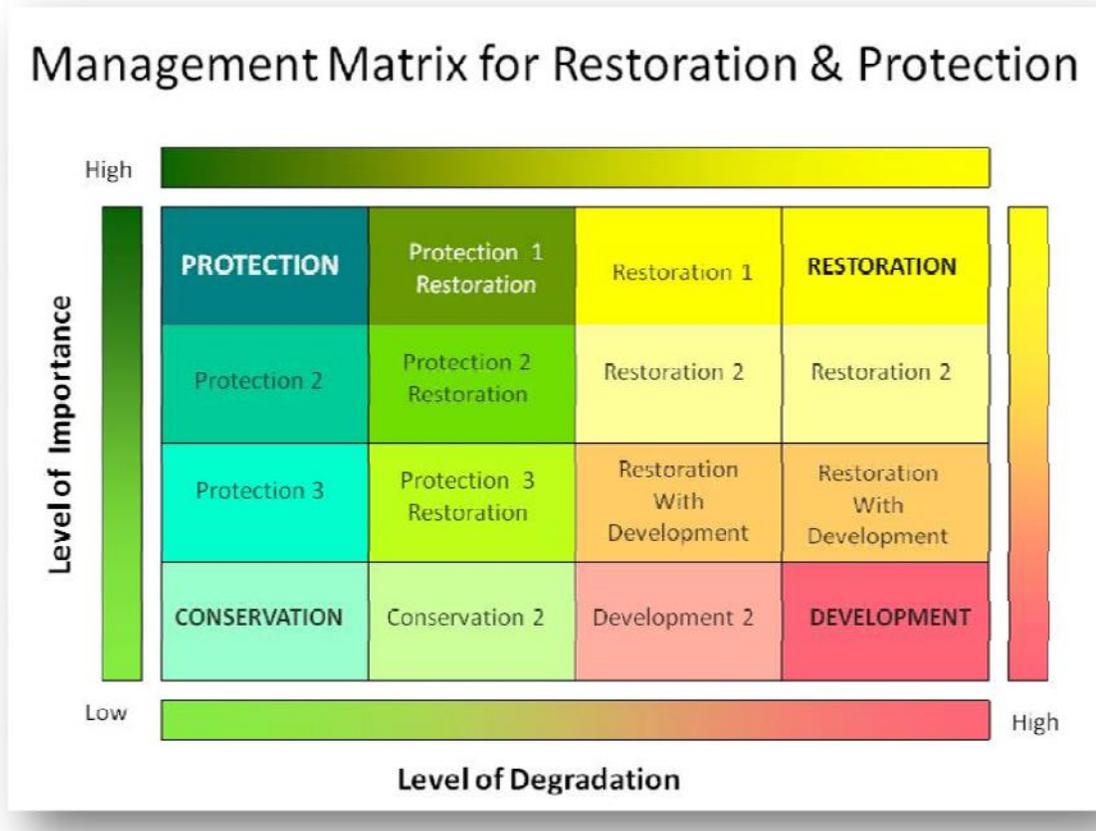
The Characterization includes watershed assessments of:

- 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” (see graphic on page 24). These 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 “Restoration”) 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 importance and significant existing human impact are broadly the

⁵⁸ The reliability of data can be confirmed using a Quality Assurance Project Plan. See [EPA's Quality System web site](#).

most appropriate areas for “Development,” given continued population pressures on the Puget Sound region.⁵⁹



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

4.3 Using Local Data

To implement a successful prioritization and/or stormwater control transfer program, a jurisdiction will need to further prioritize watersheds based on local conditions. A three-step process described below is recommended for using local data to refine prioritization of watersheds. 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

⁵⁹ [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.

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 in the watershed 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 impairment⁶⁰ 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 (TMDLs⁶¹), local knowledge, or low instream flows – that impact fish mortality and use.

NOTE: If a local government is assessing 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/Low Impact Development (LID) and Runoff Treatment Opportunity Assessment

Review the watersheds for opportunities to address flow control issues or provide runoff treatment. Give higher priority to watersheds within 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 stormwater retrofit projects appropriate for the watershed's future.
- Extent, age and condition of stormwater management treatment and flow control infrastructure – an assessment of the need for retrofitting.
- 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

⁶⁰ Ecology Prioritization Principle #1 (page 9 of draft Ecology guidance)

⁶¹ TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

strategy approach with a neighboring municipality, receiving waterbodies or receiving waters in a shared watershed may be scored higher.

- 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 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 retrofit investment. See Step 3 of ***the Local Data for Prioritizing Flow Control, LID and Runoff Treatment*** on page 38 for a discussion of tools.

Cities or counties are encouraged to seek meaningful involvement and engagement with federally and state-recognized tribes and tribal members regarding environmental justice and social equity considerations as they prioritize watersheds. These considerations include input from tribes and tribal members regarding lifeways, lands, and waters that may be impacted by prioritization decisions.⁶²

⁶² See [Recommendations for Fostering Environmental Justice for Tribes and Indigenous Peoples](#), National Environmental Justice Advisory Council, 2013.

CHAPTER 5:

Local Data Sources for Prioritization of Watersheds

This section provides recommended sources of local data to be used in the prioritization analysis – See ***Local Data for Prioritizing Flow Control, LID and Runoff Treatment*** beginning on page 29. 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 public⁶³.

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 table includes runoff treatment and LID data because they are pertinent to prioritizing a watershed for stormwater retrofit investment, and because a jurisdiction may choose to include runoff treatment and LID in a stormwater control transfer program⁶⁴. 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 retrofit investment, the Washington State Department of Transportation stormwater control transfer program is one example of how weighting can be used. See Appendix F for the weighting used by the Department.

All of the data and prioritization decisions should be informed by local on-the-ground knowledge of streams and habitat conditions. And, by more research about stormwater impacts to salmon as it becomes available.

⁶³ For an example of a locally developed data table, see the City of Redmond's [Watershed Management Plan](#), Table 3.1, pages 33 – 34.

⁶⁴ While Ecology's Stormwater Control Transfer Program guidance only applies to transfer of flow control requirements, nothing prohibits a jurisdiction from proposing a program transfer runoff treatment or LID to Ecology for approval under the permit.

5.1 Working with the Tribes, Federal and State Agencies, and the Public

5.1.1 Seeking Input from the Tribes

Tribes are local governments and communities with treaty rights to water, water quality and salmon. Local governments are highly encouraged to solicit input from the tribes early and often during the watershed prioritization process. The Tribes, via the Northwest Indian Fisheries Commission, have fish distribution data in addition to the data provided in the *Local Data for Prioritizing Flow Control, LID and Runoff Treatment*⁶⁵.

5.1.2 Seeking Input from Natural Resource Agencies

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

5.1.3 Involving the Public in Watershed Prioritization

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

5.2 Seeking Approval from Ecology (Stormwater Control Transfer Programs)

Jurisdictions seeking to use prioritization for an out of basin stormwater control transfer program will need to seek approval from Ecology per Ecology's [Stormwater Control Transfer Program: Out of the Basin](#).

5.3 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 stormwater 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.

⁶⁵ Page 29.

5.4 Local Data for Prioritizing Flow Control, LID 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		
<i>Data Sources</i>	<i>Comments/Notes</i>	<i>Uses⁶⁶</i>
Water Resource Inventory Area (WRIA) Plans provide fish distribution information. E.g., WRIA 9 Fish Distribution Maps.	<ul style="list-style-type: none"> 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
Washington Department of Fish and Wildlife’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: <ul style="list-style-type: none"> 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 location 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. Standard Operating Procedures for local government staff collecting this data by walking the creeks are 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 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 222-16-010). 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. Standard Operating Procedures for local government staff collecting this data by walking the rivers are 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		

⁶⁶ 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		
<i>Data Sources</i>	<i>Comments/Notes</i>	<i>Uses</i>
Tree canopy percentage cover in local government regulatory stream buffers using aerial photography.	<ul style="list-style-type: none"> • 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.	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
Percentage of intact 100-foot vegetated stream buffer using aerial photography.		

Step 1: Fish Use and Aquatic Conditions

Benthic Index of Biotic Integrity (B-IBI)⁶⁷, where appropriate, to measure aquatic health		
Data Sources	Comments/Notes	Uses
Other Insect measurements for Marine/Brackish waters: Terrestrial Invertebrates Standard Operating Procedures are at www.tidalmarshmonitoring.org .	<ul style="list-style-type: none"> 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. 	FC/LID, WQ
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.		
Known Water Quality Impairment		
Data Sources	Comments/Notes	Uses
Ecology State Water Quality Assessment (category 4a, 4b, 4c, or 5) at Ecology’s Water Quality Assessment and 303(d) List . Waterbodies listed as Category 5 or 5B due to impairment from the indicated water quality parameter.		FC/LID, WQ
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 government, volunteers, Ecology, and others.	WQ
Shellfish bed health - shellfish bed closure(s)- Washington State Department of Health Beach Closures	Shellfish bed closures by DOH are an indicator of water quality issues.	FC/LID, WQ

⁶⁷ 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 ⁶⁸	Comments/Notes	Uses
<u>Forest</u> – percentage of land per aerial photography or satellite imagery.	<ul style="list-style-type: none"> 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.⁶⁹ 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 high-priority. 	
<u>Pasture</u> - 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 ⁷⁰ .		
<u>Disturbed Land</u> ⁷¹ and <u>Impervious surfaces</u> - 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

⁶⁸ Land use and land cover data are often available in the same data set.

⁶⁹ Municipal Stormwater Permits for Western Washington, Appendix 1, Section 2, Definitions related to Minimum Requirements for a complete definition of “effective impervious surface”.

⁷⁰ 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.”

⁷¹ 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
<p>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.</p>		
<p>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:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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. 	<p>FC/LID, WQ</p>
<p>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 their own stream typing maps, or DNR stream typing maps, in conjunction with all other currently available data sources regarding salmon use.</p>	<ul style="list-style-type: none"> • 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. 	
<p>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.</p>		<p>FC/LID, WQ</p>

Step 2: Flow Control, LID and Runoff Treatment Opportunity Assessment

Future Land Use – Comprehensive Plans and Zoning		
<i>Data Sources</i>	<i>Comments/Notes</i>	<i>Uses</i>
<p>City or county comprehensive land use and zoning maps.</p> <p>County or city zoning, right of way, critical areas, stormwater and other regulations related to land cover.</p>	<ul style="list-style-type: none"> • 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. 	<p>FC/LID, WQ</p>

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 a 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 retrofitting.	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> 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
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.	<ul style="list-style-type: none"> • 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 ⁷²) stream length inside jurisdictional boundaries. Local critical area mapping may provide this data.		FC/LID, WQ

⁷² 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. ⁷³		FC/LID, WQ

⁷³ 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)

<i>Data Sources</i>	<i>Comments/Notes</i>	<i>Uses</i>
<p>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.</p> <p>Cities or counties are encouraged to seek meaningful involvement and engagement with federally and state-recognized tribes and tribal members regarding environmental justice and social equity considerations as they prioritize watersheds. These considerations include input from tribes and tribal members regarding lifeways, lands, and waters that may be impacted by prioritization decisions.⁷⁴</p>	<p>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.</p>	<p>FC/LID, WQ</p>

⁷⁴ See [Recommendations for Fostering Environmental Justice for Tribes and Indigenous Peoples](#), National Environmental Justice Advisory Council, 2013.

APPENDIX A

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.

Low Impact Development (LID) - means a stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design.

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)

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.

Stormwater Retrofit – For purposes of this guidance document, the term “stormwater retrofit” or “retrofit” refers to an improvement in stormwater management that treats stormwater runoff or controls stormwater flow for an existing or redeveloped surface that was not previously receiving that level of runoff treatment or flow control. A “redeveloped surface” means a surface that will require the same or more stormwater runoff treatment or flow control to meet the NPDES Minimum Requirements. This improvement in stormwater management can sometimes be transferred through an Ecology approved plan. Some retrofits are installed as part of the structural stormwater controls obligations under the Phase 1 NPDES Municipal Permit.

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

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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
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Dan Gariepy, Department of Ecology
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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.⁷⁵ The alternate location would be in a watershed in another part of the jurisdiction where receiving waterbodies or receiving waters⁷⁶ are evaluated to have a higher potential for increase in ecological function with implementation of specific stormwater control improvements⁷⁷.

This prioritization guidance can be used to prioritize receiving watersheds 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 type of stormwater control transfer program that allows the City to invest stormwater controls first in high priority 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.

⁷⁵ 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.

⁷⁶ Again, it is important to note the difference between a "receiving watershed" and "receiving waterbodies or waters" per the definitions in Appendix A.

⁷⁷ 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.

Jurisdictions where most of the regional growth centers are located are the 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 control 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 prioritization that justifies the transfer of stormwater control improvements across jurisdictional boundaries⁷⁸ or the prioritization of stormwater retrofit investments across a broad geographic region.

Using this guidance 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 in accordance with the Growth Management Act 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 stormwater 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.

⁷⁸ 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 E

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

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 <i>fish bearing</i> .	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 <i>Char</i> and <i>Core salmon spawning and rearing</i> .	High quality streams provide important habitat	3
Urban fringe	Urban fringe areas within designated <i>Urban Growth Areas</i> .	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 <i>Stage 2 Reconnaissance</i> 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

APPENDIX G

Other Resources

Local Plan Land Use Policies Recognizing Water as a Resource

Kitsap County: [Water as a Resource Policy](#)

Kirkland: [Comprehensive Plan Environment Element](#), Surface Water Policies E-1.15 and E-1.16.

Covington: [Comprehensive Plan](#) Natural Environment Element, NE – III.

Redmond: [Comprehensive Plan](#) Natural Environment Element, Policies NE-67, 68, and 69.

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)

Local Capital Facilities Plans That Include Planned Stormwater Facility Projects

Covington

Kenmore

Kirkland

Issaquah

Renton

Tacoma

Planning for Climate Change Examples

[Washington State Integrated Climate Change Response Strategy](#)

[King County's Strategic Climate Action Plan](#)

[Olympia – Sea Level Rise](#)

[Seattle Climate Action Plan](#)

[Tacoma Climate Action Plan](#)

[Shoreline Climate Action Plan](#)

[Snohomish County PUD Climate Change Policy](#)

Density as a BMP Publications

[Dense and Beautiful Stormwater Management](#), Laurence Aurbach, Ped Shed Blog, 2010.

[Watersheds, Walkability and Stormwater](#), John Jacob, ForesterDailyNews, 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.