# Nature's Scorecard:
# Local Stormwater Pollution Controls

*A Report for the Washington State Department of Ecology*
*May 2022*

*Point Defiance Regional Stormwater Park, Tacoma. Photo Credit: Rae Lee*

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# A. Executive Summary

Stormwater remains the number one source of toxic pollution to Puget Sound. It is not the rain that is the problem: chemicals released by humans into our environment build up on impervious surfaces–our roads, rooftops, and other hard infrastructure–and wash directly into our waterways when it rains. In order to restore Puget Sound, ensure healthy and climate resilient communities, and save our salmon and orcas, it is critical that we stop dumping harmful pollutants into our environment, remove existing hard surfaces that disrupt the natural hydrologic cycle, and treat and control polluted stormwater runoff. Municipal stormwater retrofits are a key component of the latter strategies.

For decades, six cities and counties that make up about half of the Puget Sound watershed have had legal requirements to treat and control polluted stormwater discharges from existing development in their jurisdictions. These municipalities are required to install stormwater treatment, flow control, and low-impact development techniques that mimic the natural environment. But until now, no one was tracking or reporting on these investments in a comprehensive way. That's why Puget Soundkeeper (PSK) and Washington Environmental Council (WEC) teamed up to find out how much progress has been made on municipal stormwater retrofits and how much work remains to be done to restore Puget Sound.

Despite requirements for municipalities to manage polluted stormwater dating back almost 30 years, and despite the known benefits of stormwater projects, **our team of reviewers found no evidence that these projects are making a dent on overall Puget Sound water quality.**

## 1. Municipal Stormwater Retrofit Requirements

The Municipal General Stormwater Permits for Western Washington are a critical piece of the Clean Water Act framework designed to protect our water from pollution. Since 1995, six Phase I Municipal General Stormwater Permittees in Western Washington (Phase I's) have been legally required to implement stormwater projects to prevent or reduce impacts to waters of the State caused by discharges from existing development within their municipal separate storm sewer systems (MS4s).[1] With the 2007 Phase I Permit update, the Washington Department of Ecology (Ecology) defined a set of six categories of qualifying Structural Stormwater Control (SSC) projects to fulfill this requirement. Ecology expanded the list to 11 types of SSCs in the 2013 Phase I Permit, identifying five SSC types that Phase I's were required to consider, and another five types they "should" consider. Ecology also adopted "Water Quality Benefit Calculation" and "Hydro Benefit Calculation" methods in 2013 for Phase I's to quantify and report the impact of individual projects. With the 2019 Phase I Permit update, Ecology revised the list of qualifying SSCs (the "list"), modified the benefit calculation methods to an incentive-points calculation method, and for the first time adopted a baseline level of effort requirement for SSCs. Phase I's

[1] Congress phased in Clean Water Act National Pollutant Discharge Elimination System (NPDES) requirements for municipal stormwater discharges in two phases. Phase I included medium and large municipalities. Populations of over 250,000 are defined as "large," while those with populations between 100,000 and 250,000 are defined as "medium" municipalities. The Washington Department of Ecology (Ecology) issued the first Municipal General Stormwater Permits for medium and large municipalities (Phase I's) on July 5, 1995, as determined by the 1990 census. The six "Phase I's" are King County, Snohomish County, Clark County, Pierce County, Seattle, and Tacoma. Source: 2019 Phase I and II Municipal General Stormwater Permit Factsheet, available online at MunicipalPermitsFactSheet2018.pdf (wa.gov). Ecology has stated that no new permittees will be added to the Phase I Permit.

must now achieve a certain number of "points" each permit cycle. To date, Phase II[2] Permittees have no SSC requirements.

## 2. This Project

The goals of the Clean Water Act (1972) were to make all U.S. waters fishable and swimmable by 1983, and to ensure zero water pollution discharge by 1985. In this 50-year anniversary of the Clean Water Act (2022), Washington is far from achieving these goals, with almost half (47%) of the state's surveyed freshwater and a fifth (21%) of surveyed marine waters being impaired for at least one pollutant.[3]

In late 2020, PSK and WEC set out to verify our region's progress on municipal stormwater retrofits. Our team reviewed public reports submitted to Ecology by five Phase I's (King County, Seattle, Tacoma, Pierce County, and Snohomish County) from 2007 to 2021 to assess the number, type, and location of SSC projects made in the last 15 years. Reviewers also researched the budgets and capital infrastructure plans of seven similarly populous Phase II jurisdictions (Bellevue, Everett, Federal Way, Kent, Renton, and Thurston and Kitsap counties) to understand if and where these municipalities were implementing SSCs during the same time period. Reviewers then reached out to agency staff to ensure accuracy and completeness of the data.

The five Phase I's reviewed include jurisdictions that cover almost half of the Puget Sound basin or drainage area. Yet over the 15-year period we studied, these Phase I municipalities reported a mere 268 (qualifying) structural stormwater control projects, which averages to less than 18 projects combined a year and includes projects that lack any clear stormwater nexus. In comparison, the seven Phase II's we reviewed (Everett, Renton, Bellevue, Federal Way, Kent, Thurston County and Kitsap County) did 183 SSC projects.

Our research revealed that:

- Some Phase II's are doing more projects than Phase I's – despite having no requirements to do any
- Some permittees are reporting projects with little or no stormwater nexus to comply with Clean Water Act requirements; and
- Reporting requirements lack context needed to determine if water quality is improving

This project uncovered flaws in the permits that could be remedied to better protect our waters. Our primary conclusion is that both the Phase I and II Permits fail to require that stormwater investments be made in a targeted approach that results in demonstrable water quality improvements. Existing regulations allow municipalities to do too little, too slow, by failing to

[2] EPA issued the federal rules for Phase II of the stormwater permit program in 1999. The Phase II rules extend coverage of the NPDES program to certain "small" municipal separate storm sewer systems within Urbanized Areas (population centers with greater than 50,000 people and densities of at least 1,000 people per square mile, with surrounding areas having densities of at least 500 people per square mile). In 2007, Ecology issued the first Phase II Municipal Stormwater General Permits. Source: 2019 Phase I and II Municipal General Stormwater Permit Factsheet, available online at MunicipalPermitsFactSheet2018.pdf (wa.gov). There are currently 87 Phase II Permittees, including 82 cities and towns, and 5 counties.

[3] Department of Ecology Focus Sheet, Draft Water Quality Assessment (April 2021). Available online at: https://apps.ecology.wa.gov/publications/documents/2110015.pdf

mandate a clear, holistic strategy paired with demonstrable stormwater pollutant reductions each permit cycle. If business continues as usual, we will not save Puget Sound.

## 3. Recommendations

- Ecology should modify section S.5.C.7 of the Phase I Permit to an "Existing Development"-or "Retrofit"-requirement, focused on controlling polluted stormwater runoff from existing development and restoring waters. The same requirement should apply to Phase II Permittees.
    - For these projects, Ecology should require prioritization of projects or actions in the built environment, in areas with a high or medium prevalence of Urban Runoff Mortality Syndrome (URMS), and in overburdened communities.
- Ecology should shift to a proportionate approach for Retrofit requirements for Phase I's and II's. To control stormwater from existing development, permittees should be required to restore a specifically defined proportion or quantity of the stormwater problem or impacted area within their jurisdiction each year and each Permit cycle. Under this framework, performance should be evaluated based on whether each permittee has restored, and protected, the required proportion or quantity of waters in their jurisdiction each Permit cycle.
    - Permittees could choose to mix and match from the tools in the Permit to restore the required proportion or quantity of waters each Permit cycle.
    - This framework would build on and strengthen current Stormwater Management Action Planning (SMAP) planning requirements.
- Ecology should create a separate "Future Development"-or "Preservation"-requirement for Phase I and II Permittees to implement projects, including current SSC Types 5, 7, and 8, targeted to prevent future water quality degradation and preserve conditions in undeveloped or less developed areas. To prevent or reduce impacts from expected future development, permittees should be required to protect a specifically defined proportion or quantity of the area expected to suffer future impacts each Permit cycle.
- Ecology should create new standalone Phase I and II Permit requirements to perform line cleaning (SSC Type 11) and maintenance projects exceeding $25,000 (SSC Type 6). Street-sweeping programs (SSC Type 11) could be included in the qualifying SSC project list(s) under a "proportionate" approach for Existing Development and/or Future Development requirements, or be separated into a new, distinct permit requirement for certain Phase I's and II's.
- SSC requirements should be expanded to Phase II's.

# B. Methodology

Reviewers assessed five Puget Sound Phase I Permittees (King County, Snohomish County, Pierce County, Tacoma and Seattle) and seven Puget Sound Phase II Permittees (Bellevue, Everett, Renton, Kent, Federal Way, Kitsap County, and Thurston County). Reviewers selected these Phase II's because they currently exceed 100,000 or 250,000 in population size, meeting the original defining criteria for Phase I Permittees. From late 2020 through 2021, we researched and compiled data regarding the number, type, and location of qualifying SSCs planned or built between 2007 – 2021.

Reviewers pulled and reviewed every annual report and document filed by these Phase I's and II's with Ecology between 2007 - 2021. Because Phase II's have no requirement to do or report SSCs, in addition to reviewing all annual report filings, reviewers also researched all publicly available Phase II budgets and capital facility plans from 2007 to 2021. For Phase I's, reviewers recorded every reported SSC project between 2007 and 2021, refined the list by removing duplicates, and refined the list further by identifying projects that were reported but did not appear to meet the 2019 Phase I Permit definition of any qualifying SSC. For Phase II's, reviewers followed the same methodology using budgets and capital facilities plans. Reviewers then met with Ecology staff to discuss whether questionable project descriptions might qualify as an SSC. To ensure completeness and accuracy of the data, reviewers sought input from municipal permittee staff. Non-qualifying projects and duplicates were flagged and ultimately removed.

Reviewers mapped the final project lists for all Phase I's and II's in ArcGIS (ArcGIS is a family of client software, server software, and online geographic information system (GIS) services developed and maintained by Esri), using three map layers as a lens through which to assess the projects:

- A land cover map from 2020 mapping land by whether it is covered by trees, grass, water, crops, snow, bare ground, or the built environment,
- A coho salmon pre-spawn mortality map predicting areas of low (<10%), medium (10%-40%), and high (>40%) incidence of Coho Prespawn Mortality[4], and
- The Washington Department of Health's environmental health disparities map.[5]

Due to the nature of SSC Types 6 and 11 projects, which often occur annually at the same facility location year after year, or annually on defined "routes" that lack one set of GIS coordinates: reviewers excluded these "repeat annual maintenance projects" from the GIS analysis. Instead, reviewers included one set of GIS coordinates for each of these "multi-year" projects. Reviewers then analyzed the data to identify patterns and trends. Results were compiled in this Report and an online Storymap, available at www.naturesscorecard.com.

[4] Coho Prespawn Mortality, also called Urban Runoff Mortality Syndrome (URMS), is a phenomenon observed in adult coho returning to urban and urbanizing stream networks contaminated with untreated stormwater. Soon after entering freshwater streams, the fish become sick and die before they can reproduce.

[5] An interactive mapping tool that compares communities across our state for environmental health disparities. The map shows pollution measures such as diesel emissions and ozone, as well as proximity to hazardous waste sites. In addition, it displays measures like poverty and cardiovascular disease. The map also provides new and rigorous insights into where public investments can be prioritized to buffer environmental health impacts on Washington's communities, so that everyone can benefit from clean air, clean water, and a healthy environment.

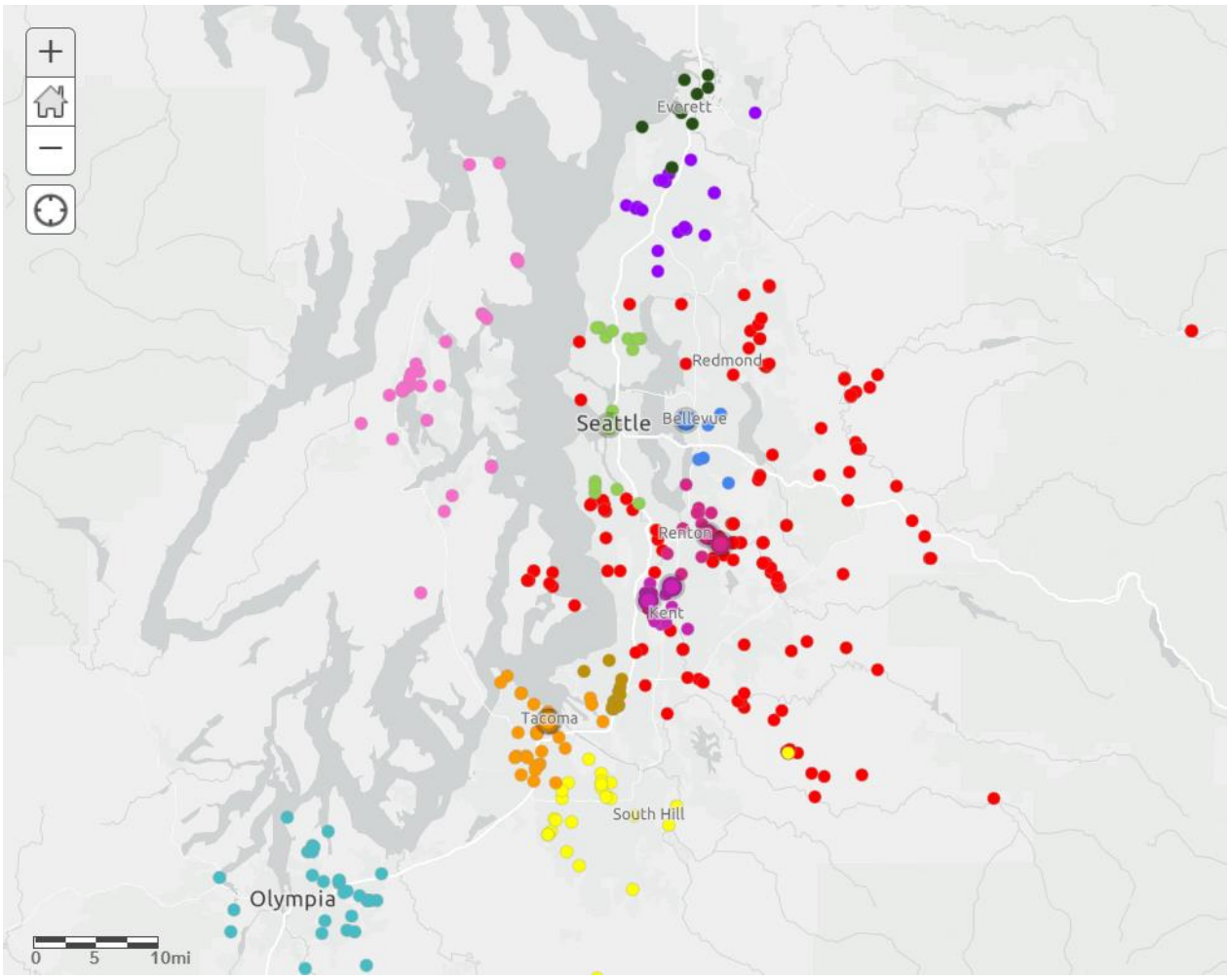
# C. Detailed Findings and Recommendations

### Finding 1: An Opportunistic Approach to SSC Investments.

**DATA**

The data shows that from 2007 to 2021, the majority of Phase I's reviewed during this project implemented many isolated projects throughout the jurisdiction, rather than strategically targeting all or most investments in one area or in the drainages to one or more waterbodies to restore it/them. This is in part due to the Structural Stormwater Control (SSC) requirements in the permit (S.5.C.7 and Appendix 12), and in part due to some municipalities adopting an "opportunistic" approach to SSC investments.

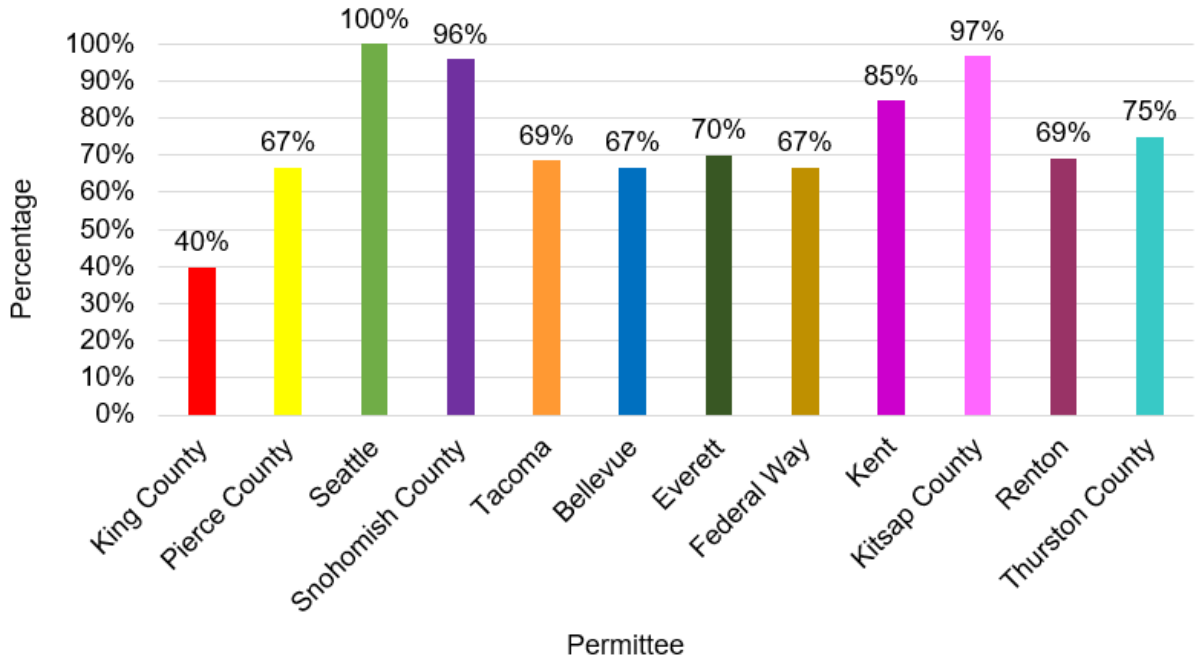
**Figure 1:**
**Map of 451 Total Qualifying SSC Projects**
**by Phase I's and II's from 2007 – 2021**



First: S.5.C.7 of the Phase I Permit, on Structural Stormwater Controls, reads: "[t]he program shall consider impacts caused by stormwater discharges from areas of existing development; including runoff from highways, streets and roads owned or operated by the Permittee; and areas of new development, where impacts are anticipated as development occurs." This language allows permittees to perform structural retrofits to control stormwater originating from the built environment, as well as stormwater originating from less developed or undeveloped areas. When retrofitting the built environment, SSC Types 1-4 from Appendix 12 may be more appropriate, whereas SSC Types 5, 7, 8, and 9 are project types that preserve or restore natural ecosystem function. We found that, while all permittees implemented SSCs in the built environment, some Phase I Permittees placed approximately a quarter to a third, or even more, or their reported SSCs in undeveloped or rural areas characterized by a GIS land cover map as some type of greenspace (grass, trees, shrub/scrub land, and flooded vegetation).

The graph below shows the total percentage of all non-repeat annual maintenance SSC projects by Phase I's and II's that were in the built environment.

**Figure 2:**
**Percentage of Non-Repeat Annual Maintenance Projects Located in the Built Environment (vs. Greenspace)**




Second: our research revealed that some municipalities have adopted an "opportunistic," or reactive, rather than proactive restoration approach to SSC investments. This showed up in several ways: first, a Phase I might report a "qualifying" project to Ecology because it matches an SSC type, but not necessarily because it was planned to address a specific stormwater problem or meet permit requirements. Reviewers learned that it may in some instances be easier for stormwater staff to meet permit requirements by claiming "credit" for projects done by, for example, a municipal Parks Department to preserve or restore ecosystem functionality in less developed or undeveloped areas (primarily SSC Types 5, 7, 8, and 9). This is because those

projects may be easier to fund, and easier to report, than structural stormwater retrofits for the built environment (primarily SSC Types 1-4). Second, a municipality might take an "opportunistic" approach by choosing to add SSC features on to projects already being planned for some other purpose (e.g., culvert removal or levee setbacks).

On the other hand, Seattle is one Phase I that has taken a more targeted approach to planning and reporting SSCs implemented to restore specific waters. For example, in 2019, 2020 and 2021, Seattle reported several Neighborhood Drainage System SSC projects targeted to address stormwater pollution in areas including Longfellow Creek, Thornton Creek, and Piper's Creek–three urban Creeks where salmon historically suffered a high rate of URMS.

**Example 1**:

The following graphs (Figures 2-4) show the percentage of non-repeat annual maintenance SSC projects done by three Phase I jurisdictions that were implemented in the built environment, as opposed to areas characterized as cropland or greenspace (grass, trees, shrub/scrub land, and flooded vegetation), or in "undetermined" land cover types (water and bare ground). These analyses were run through ArcGIS (geographic information systems (GIS) software). Repeat annual maintenance projects were assigned one data point per project in GIS.

**Figure 3:**
**67% of Tacoma's Non-Repeat Annual Maintenance SSC projects were in the Built Environment**

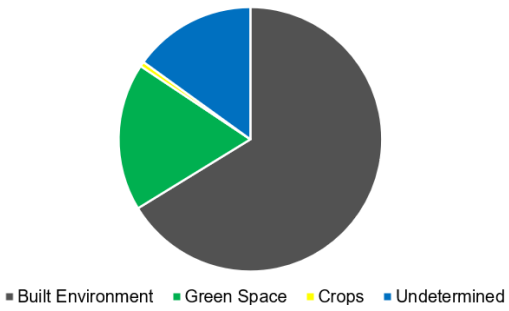



**Figure 4:**
**70% of Pierce County's Non-Repeat Annual Maintenance SSC projects were in the Built Environment**

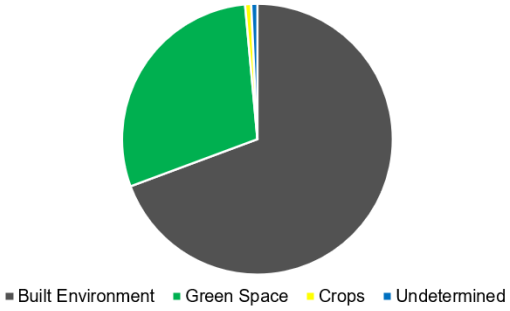
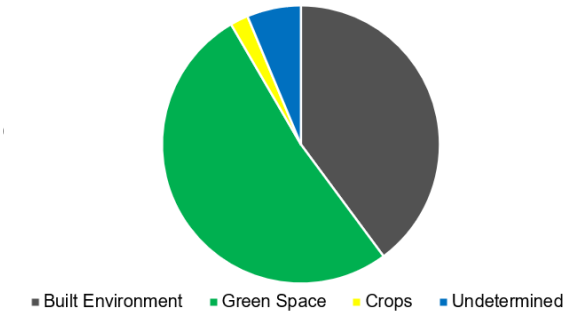



**Figure 5:**
**40% of King County's Non-Repeat Annual Maintenance SSC projects were in the Built Environment**

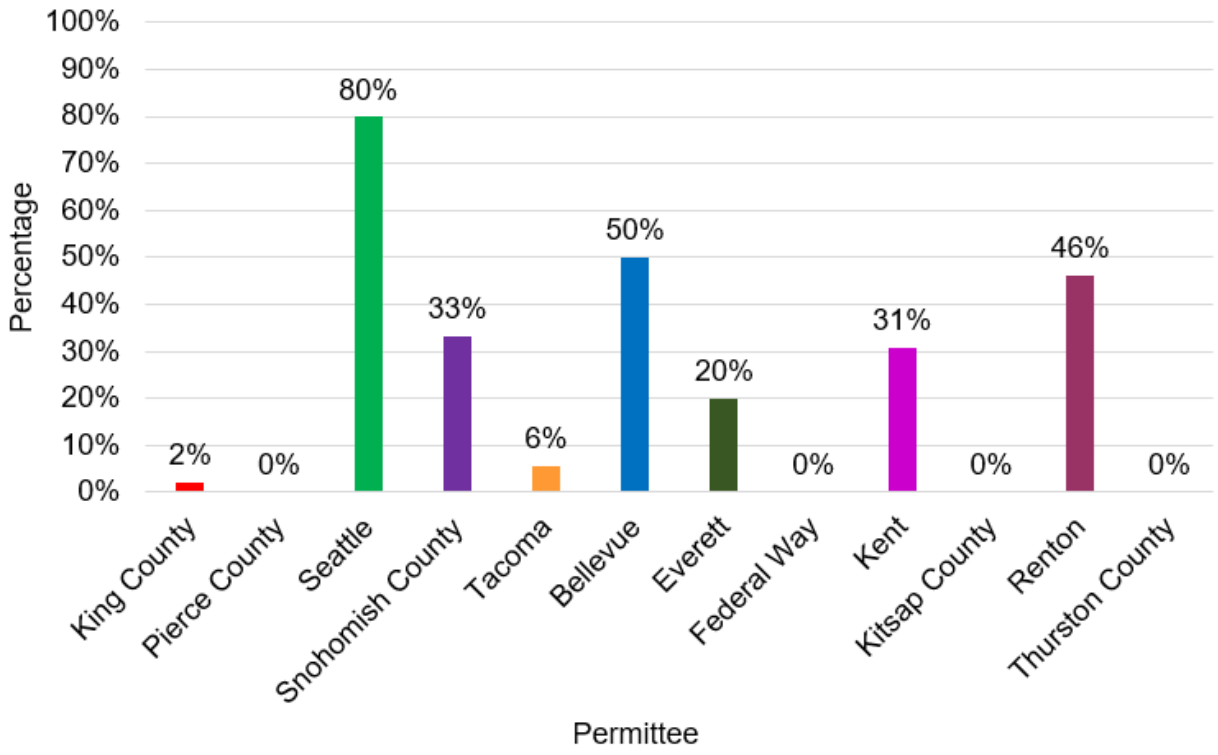


Stormwater pollution is worst from areas with the most impervious surface. Scientists have drawn the connection between heavily trafficked roads and increased toxic stormwater pollution. Presumably, investments made in the built environment would be better located to treat and control stormwater runoff from existing development that contains higher concentrations of toxic pollutants. Simply preserving the status quo–by preventing future impacts to more pristine areas–is insufficient. The Clean Water Act requires that we also address stormwater pollution from existing impervious surfaces–thus restoring areas that are currently degraded There are several ways the permittees could be targeting their investments more strategically to restore waters polluted by stormwater–but many did not.

**Example 2:** Scientists have known for years that toxic stormwater pollution causes coho prespawn mortality, a phenomenon where returning salmon appear to gasp for breath, swim erratically and in circles, and die within a few hours of exposure to stormwater when returning to their native urban creeks to spawn. Since the 1980's, local stream surveyors documented the effects of polluted road runoff on coho – leading to the name "Urban Runoff Mortality Syndrome" (URMS). Researchers recently isolated the chemical culprit causing URMS: 6PPD-quinone, a derivative of the chemical 6PPD from tires that reacts with ozone. However, researchers have known for decades that filtering polluted stormwater runoff through bioretention (a low impact development best management practice, or LID BMP, as well as a qualifying Structural Stormwater Control) filters out toxic stormwater pollutants and stops URMS.

The following analyses of SSC projects in each of the 12 surveyed permittee jurisdictions were performed by mapping the projects in ArcGIS overlaid with data regarding the rates of predicted coho prespawn mortality. Repeat annual maintenance projects were assigned one data point per project in GIS. Approximately 65% of all non-repeat annual maintenance projects were in medium coho mortality areas, whereas only 11% of the total projects were in high coho mortality areas.

**Figure 6:**
**Percentage of Non-Repeat Annual Maintenance Projects**
**Located in High Predicted Coho Mortality Areas**




Areas with high predicted URMS in urban creeks and streams (40% or more) are correlated with a heavier input of tire chemicals from impervious surface via stormwater, yet, many permittees are not prioritizing these areas for SSC investments.[6] In observing where SSC investments were made in the context of coho spawner mortality rates based on modelling based on surveys of 51 creeks throughout Puget Sound, reviewers found that while permittees heavily invested in areas predicted to have a medium coho mortality rate (10-40%), permittees have not heavily invested in areas predicted to have a high coho mortality rate (>40%).

*It should be noted that location of projects within high, medium, or low predicted coho mortality rates does not imply intent on the part of municipalities to remedy coho mortality. Further, this data does not consider the proportion of waters within each jurisdiction that are predicted to experience high, medium, or low coho mortality rates.*

**Example 3**: Since at least the 1980's, researchers have known that toxic pollution disproportionately impacts communities of color and low-income communities. In December 2018, the Washington State Department of Health published an interactive map online

[6] Note: the data depicted in Figure 6 does not account for the proportion of each permittee's jurisdiction that is Coho habitat vs. "N/A," which the underlying modelers indicated means that they did not predict coho spawner mortality for those subbasins because they allegedly are not used by coho.

documenting census tracts in Washington where communities are more heavily burdened by environmental health disparities (EHD), looking at factors including exposure to lead, NOx-diesel emissions, and particulate matter in the air; proximity to wastewater discharge, Superfund sites, hazardous waste storage and disposal facilities; and much more.[7] The EHD map tool quantifies the negative environmental health effects experienced by communities within census tracts, from "high" (rankings 8, 9, or 10 on the 1-10 scale), to "low" (rankings 1-7 on the 1-10 scale).

In the 2019 Phase I Permit, for the first time, Ecology defined the term "overburdened communities." Though there are no specific requirements for permittees to prioritize SSC investments or other stormwater investments in overburdened communities, Phase I's are required to include overburdened communities in their public involvement and participation process for Stormwater Management Action Planning (S.5.C.4), and in their outreach and education program within their Stormwater Management Plans (S.5.C.11.a.i.(a)). Furthermore, the 2019 permit awards Phase I Permittees additional SSC points for projects in these communities.

While some municipalities have adopted equity and social justice plans, and King County and Seattle are currently managing some stormwater projects that involve a high level of community input or even co-design; as of October 2021, none of the Phase I Permittees reviewers interviewed had implemented an equity or social justice lens into their stormwater programs or SSC project planning processes. While some permittees invest heavily in high-ranking environmental health disparity (EHD) communities, this correlation is not necessarily the result of planning these projects to address those disparities.

Figures 7 and 8 below represent the number of non-repeat annual maintenance SSC projects done in high EHD areas by Phase I and Phase II municipalities, respectively. These analyses were run through ArcGIS. Repeat annual maintenance projects were assigned one data point in the GIS analysis per project.

[7] Note: the Environmental Health Disparities Map does not include stormwater pollution as a factor for ranking census tracts.

**Figure 7:**
**Percentage of Non-Repeat Annual Maintenance**
**Phase I Projects in High Ranking EHD Census Tracts**

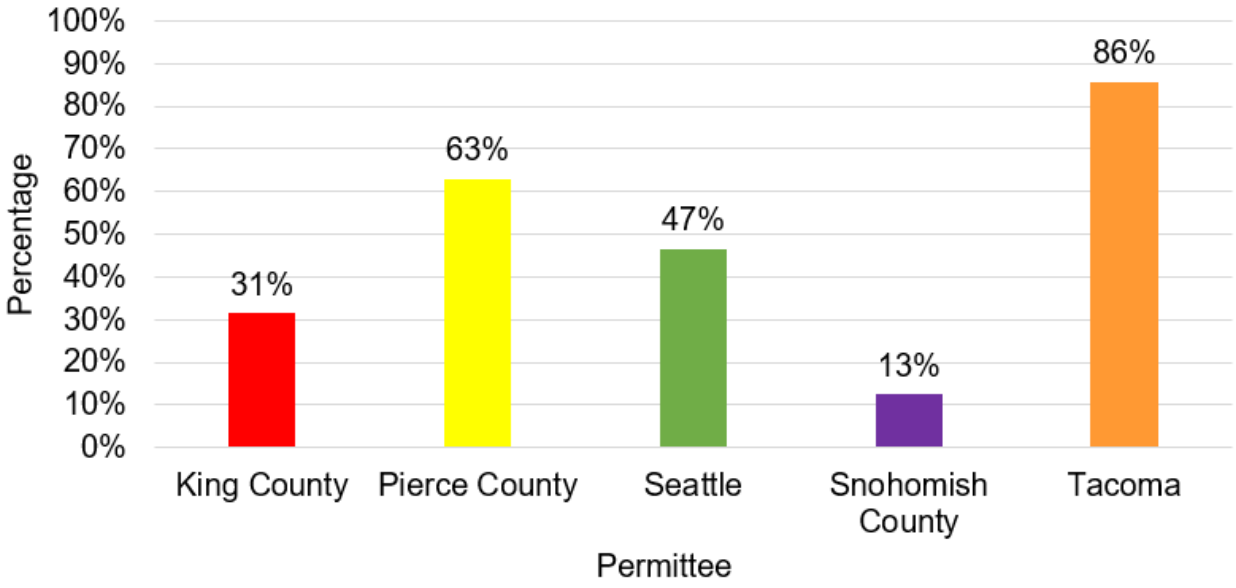
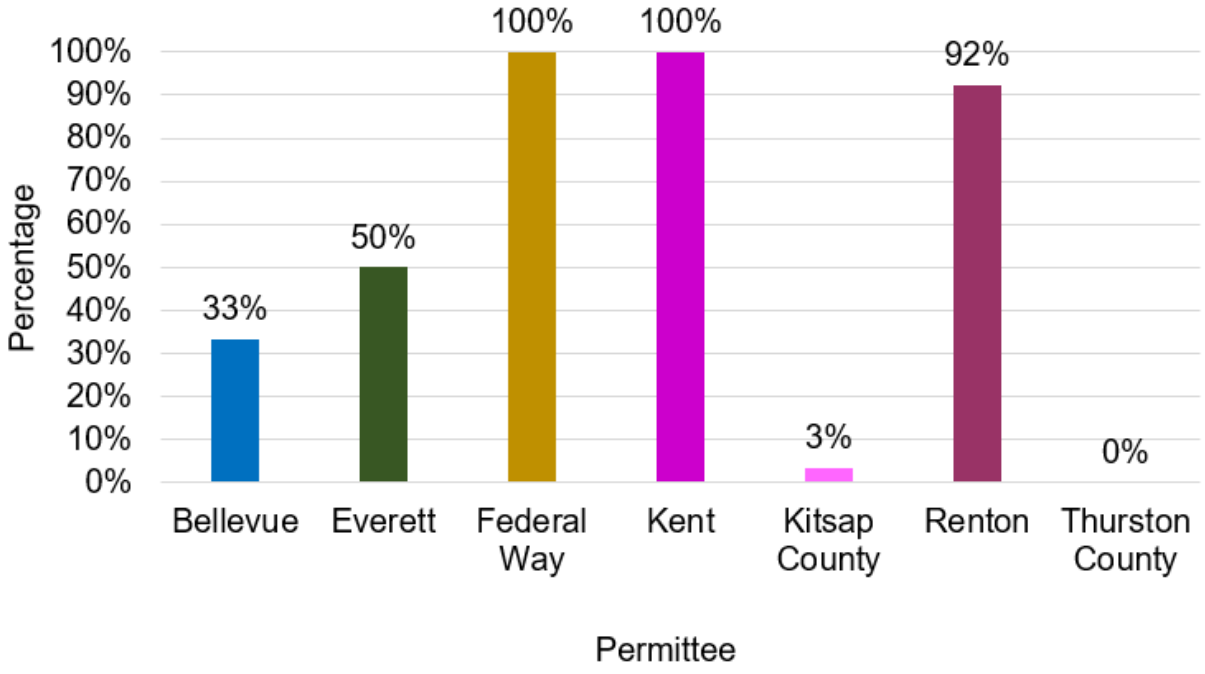



**Figure 8:**
**Percentage of Non-Repeat Annual Maintenance**
**Phase II Projects in High Ranking EHD Census Tracts**



*It should be noted that mere location of projects within high- or low-ranking environmental health disparities census tracts does not imply intent on the part of municipalities to address specific environmental health disparities with such projects, or otherwise benefit human health or well-being. Further, this data does not consider the proportion of each jurisdiction that is ranked low vs. high by the Washington State Department of Health EHD map, or the amount of waters located within low vs. high ranked EHD areas. And, as previously noted, Phase II's do not have an SSC requirement.*

## FINDINGS AND CONCLUSIONS

Since 2007, the permits have not mandated a targeted approach to SSC investments that requires stormwater retrofits to be targeted to restore specific waterbodies, or that requires permittees to address URMS, or that requires that certain communities be prioritized. Further, despite that permittees have engaged in various basin and sub-basin planning exercises that could form the basis for prioritizing SSCs, to date permittees have had no requirement to strategically implement those Basin Plans and Stormwater Management Action Plans.

In 2012, Ecology required Phase I Permittees to engage in Basin Planning. To date, there is no requirement to implement those plans. In 2019, Ecology implemented a new Stormwater Management Action Planning (SMAP) requirement for Phase I Counties and Phase II Permittees. To date, there is no requirement to implement those plans.

Currently, Phase I counties are required to identify and prepare a SMAP no later than December 31, 2022, for a single sub-basin or catchment area located within the geographic areas for which basin plans were developed in the 2013 permit, or in an alternative watershed. Phase I Counties must identify specific short- and long-term actions, strategies, and other activities to control stormwater in that sub-basin or catchment area. Phase II Permittees have similar SMAP planning requirements and must submit a watershed inventory by March 31, 2022, and a SMAP for at least one high priority catchment area by March 31, 2023. While this seems promising, if Ecology fails to require SMAP implementation in 2024, then as with the Basin Planning exercise from the 2012 Phase I Permit, SMAP planning could be just that – another planning exercise.

In light of the Ecology's failure to require implementation of these plans, it is not surprising that from 2007 until 2021, most Phase I Permittees took opportunistic or reactive approaches to SSC implementation throughout their jurisdictions. Many municipalities have not made any investments in areas with a high predicted incidence of URMS; some municipalities do not even appear to be focusing on the built environment; and no permittees have made intentional investments to address environmental health disparities in overburdened communities–where projects may be most beneficial from the human perspective.

### Recommendation 1: Modify S.5.C.7 to Focus on Retrofits to Control Stormwater From Existing Development and Require Prioritization of Stormwater Retrofit Projects in the Built Environment, in Areas with a High or Medium Prevalence of URMS, and in Overburdened Communities.

In requiring Stormwater Management Action Plan ("SMAP") planning in the 2019 permits, Ecology took a good step forward in requiring strategic *planning* for SSCs for both Phase I's and II's. But it is *implementing* these plans that has the potential to make a difference. Ecology should carefully assess and either approve or disapprove and modify each permittees' watershed inventories,

prioritization frameworks, and SSC investment approaches identified in permittees' SMAPs. Based on our review of the data, reviewers believe we could see better water quality and community results if Ecology were to update the permits in 2024 to require permittees to prioritize stormwater retrofit projects to restore degraded areas by:

- Targeting investments in the built environment
- Targeting and stopping known stormwater pollution hotspots, or restoring specific basins, sub-basins, waterbodies, or streams, such as urban creeks with a high (>40%) or medium (10-40%) prevalence of URMS, and/or
- Targeting and restoring waters currently experiencing stormwater pollution impacts within high Environmental Health Disparities ranking (ranking 8, 9, or 10) census tracts, or otherwise in overburdened communities identified by each permittee

Furthermore, Ecology should pivot away from a points-based system for SSC investments–whether these investments are intended to restore degraded areas or prevent future impacts to more pristine waters. A better approach would be to base the required level of effort, for all stormwater investments, on what is necessary to stop stormwater pollution in a defined number, quantity, or proportion of the total, sub-basins, catchment areas, or waters in each jurisdiction. Reviewers will discuss this approach further in recommendation 2 below.

**Finding 2: Reporting Requirements Are Insufficient to Assess Efficacy of Investments.**

**DATA**

To date, Structural Stormwater Control (SSC) reporting requirements have not yielded sufficient contextual information to assess SSC performance. First: starting in 2007, Phase I Permittees had to "map all known municipal separate storm sewer outfalls and receiving waters, and structural stormwater treatment and flow control BMPs[8] owned, operated, or maintained by the permittee" (S.5.C.2 (b)(i))–but permittees have never been required to provide their maps to Ecology with their annual reporting. GIS maps including SSC project locations, types, maintenance history, and ideally, reporting data regarding treatment and/or flow control efficacy, along with similar data for any other known low impact development best management practices (LID BMPs), or stormwater facilities in the jurisdiction, could be illuminating. Such information could allow Ecology and the public to better understand the full scope of each jurisdiction's–and thus the region's–stormwater pollution problem and progress made to date to control it, allowing for greater accountability. Yet it is not readily accessible to the public.

Second, the 2007 permit required Phase I's to "develop a Structural Stormwater Control program designed to control stormwater impacts that are not adequately controlled by other required actions of the SWMP,[9]" with implementation to begin no later than 2008. (S.5.C.6 (b)(i)). Pursuant to a 2009 permit modification resulting from a permit appeal, permittees were also required to "provide a list of planned individual projects that are scheduled for implementation during the term

[8] Best Management Practices

[9] Stormwater Management Program. "A SWMP is a set of actions and activities comprising the components listed in S5 [of the Phase I Permit], and additional actions necessary, to meet the requirements of applicable TMDLs pursuant to [other Permit sections]."

of this permit and describe how the selected projects comply with AKART[10] and MEP[11] requirements" (*Id*.). Having reviewed the annual reports and project lists filed by five Phase I jurisdictions from 2007–2021, reviewers were unable to identify any descriptions, by any of the five Phase I's regarding how their SSC projects met AKART and MEP requirements to control stormwater impacts in their jurisdiction not adequately controlled by other SWMP requirements.

Third, starting in 2007, Phase I's were also required to report their "prioritization process, procedures and criteria used to select the Structural Stormwater Control projects" (S.5.C.6 (b)(ii)). This information is not uniformly reported by permittees and when it is, it is often reported in broad strokes. Moreover, though Phase I's report they are implementing projects pursuant to a number of plans, they do not report their progress towards completing those plans or provide other contextual information that would indicate how long it will take to complete them.

For example, in 2015 King County reported prioritizing SSC Type 1, 2, and 3 projects pursuant to a Small Stream Basin Retrofit Planning Program (for 67 small stream basins in unincorporated King County), the WRIA 9 Stormwater Retrofit Plan, the Miller/Walker Creeks Stormwater Retrofit Plan, and the Bear Creek Stormwater Basin Plan. The County also reported different strategies for SSC Type 5 projects (including salmon recovery plans, the Flood Hazard Management Plan, basin plans, habitat studies, recreation plans, and more), and for SSC Type 6 projects. Yet we could not find any results, or any explanation whether and how much progress was made on these plans, in the county's annual reports.

Finally, also in 2007, Phase I's had to provide the following information for each reported SSC project:

- The estimated pollutant load reduction that will result from each project designed to provide stormwater treatment
- The expected outcome of each project designed to provide flow control
- Any other expected environmental benefits
- If planned, monitoring or evaluation of the project and monitoring/ evaluation results

While this information could be useful in the right context, without sufficient additional contextual information – such as water quality monitoring and reporting; any reporting whether stream or waterbody health is improving, the same, or worsening each year; and/or a description of *all* combined actions taken to control stormwater to that receiving water, etc.–there is no way to assess whether reported SSCs and other actions have sufficiently stopped or controlled pollution, or restored any receiving waters.

Clean Water Act permits must be updated every five years. In 2013, Ecology adopted a new reporting template in Appendix 11 of the Phase I Permit. This permit utilized an "incentive points" calculation system by which different SSC projects were to be awarded Hydro Benefit and Water

[10] All Known and Reasonable Technologies

[11] Maximum Extent Practicable. The permit requires that the permittee "…shall reduce the discharge of pollutants to the maximum extent practicable (MEP)," and requires "all known, available, and reasonable methods of prevention, control and treatment (AKART) to prevent and control pollution of waters of the State of Washington."

Quality Benefit points for projects providing flow control and runoff treatment benefits, respectively. The 2013 Phase I reporting template is depicted below in Figure 9.

**Figure 9:**
**2013 Phase I Permit SSC Project List Reporting Template**

*Phase I Municipal Stormwater Permit*

**APPENDIX 11 – Structural Stormwater Controls Project List**

The annual reporting requirement described in S5.C.6.c must follow the format and instructions provided in this appendix. Once placed on the list, projects must remain on the list throughout the permit cycle even if the project is cancelled.

| Project Name | Type[1] | Start Year | Status[2] | End Year | Cost Estimate[3] | Funding (%) | | | WQ Benefit (Est. TSS or TS reduction lbs/yr)[4] | Hydro Benefit (Est. Avg. % flow reduction)[5] | Hydro Benefit Option # | Retrofit Incentive[6] | Other benefit | Monitoring Planned (yes/no) | Lat / Long (X,Y) | Receiving water body name | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Local | State | Federal | | | | | | | | | |
| *XYZ Pond* | *2* | *2013* | *4* | *2015* | *$75K* | *50* | *25* | *25* | *0.1* | *75%* | *1* | *0.345* | *Demo project* | *yes* | *47/-122* | *Wet Creek* | *EXAMPLE ONLY* |
| | | | | | | | | | | | | | | | | | |

Again, because the flow control and runoff treatment benefit calculations are constructed based on individual projects alone, without additional contextual information about the receiving waters and watershed, there is no way to assess whether reported SSCs and other actions have sufficiently controlled pollution or restored the receiving water.

In the 2019 Phase I Permit, Ecology modified the approach to calculating the "benefits" of SSC projects and implemented a minimum points requirement. Phase I Permittees must now report on the basin area being treated or controlled by the SSC. The 2019 Phase I reporting template is shown below in Figure 10.

**Figure 10:**
**2019 Phase I Permit SSC Project List Reporting Template**

**Table 1: SSC Project List Template**

| Project Name | Project Type | Status | Cost Est. | Basin Area (ac) | LID Equiv. Area | LID Point Factor | RT Equiv. Area | RT Point Factor | FC Equiv. Area | FC Point Factor | Other Project Area- Ac or mi | Other Point Factor | Total SSC Program Points | Lat / Long (X,Y) | Receiving waterbody name | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | |

As with the 2007 and 2013 permits, Ecology is not requiring Phase I Permittees to report data that would give context to the number of SSC projects reported or the points claimed, such as: monitoring and reporting water quality improvements; reporting other actions taken to control stormwater to the receiving water; providing information regarding how many creeks, sub-basins or receiving waters are currently being restored by SSCs out of the total number within each jurisdiction; providing information regarding the total acre-feet of receiving waters or stream-miles

within each jurisdiction, their condition, and how conditions have improved as a result of stormwater actions taken since 1995; the total quantity of impervious street-miles or acre feet of impervious surface within the jurisdiction and how many of those street-miles or acre feet are currently being controlled; or information regarding the amount or proportion of impervious surfaces within the jurisdiction generating stormwater that is being treated or controlled vs. the amount that is not.

In the 2019 Phase I and II Permits, Ecology took steps to require more strategic and impactful SSC planning requirements by implementing a Stormwater Management Action Planning (SMAP) requirement for some permittees. However, Ecology failed to require anything beyond SMAP planning in the 2019 permit cycle for both Phase I's and II's; implementation is not required. And, as noted before, for some jurisdictions, planning is not the problem; in fact, there are plenty of plans available. Implementation should be required immediately, with demonstrable progress made each year towards achieving the clean water goals in each plan.

To complicate matters, reviewers discovered that Phase I Permittees use different reporting strategies. Only three of the five Phase I's reviewed complied with their 2013 permit requirement to calculate and report the Hydro Benefit and Water Quality Benefit for their SSC projects. The three Phase I's that did the required reporting were not required to report, nor did they report, the data used to calculate Benefit numbers. Four of the five Phase I's reviewed are now reporting using the new points calculation tables in Appendix 12 of the 2019 Phase I Permit. **All permittees should report all required information to Ecology**.

Likewise, reviewers found that Phase I's pick and choose which SSC projects to report. Phase I's are not required to report every SSC project they plan or implement, and thus they do not. Based on our review of annual report filings as well as conversations with municipal staff, different permittees have adopted different approaches to reporting. For example, Seattle and Tacoma strategically report "bigger ticket" projects. On the other hand, King County previously implemented a strategy of over-reporting certain projects, including heavily reporting flood-related projects. This results in inconsistencies making performance assessment difficult.

Finally, entire categories of projects are excluded from consideration by Ecology, as they were never provided by permittees. Both Phase I and II municipalities have implemented SSCs since at least 1980, regardless of any permit requirements. And, since 2016, all permittees–both Phase I's and II's–have had a regulatory requirement to mandate low impact development (LID) for all new development, redevelopment, and new construction in the jurisdiction meeting certain size requirements. These older SSC investments, and private LID projects, are not currently reported to Ecology or considered as part of the full picture of SSC investments within each jurisdiction.

## FINDINGS AND CONCLUSIONS

Ecology cannot know whether the existing Structural Stormwater Control (SSC) permit requirements are sufficient because to date Ecology has not calibrated SSC requirements to address jurisdiction-specific problems; permittees are not reporting all their projects; permittees are not reporting on the big picture of all stormwater investments within their jurisdictions; and permittees are not monitoring and reporting water quality improvements or progress made towards addressing their jurisdictions' stormwater problems.

In light of the above identified flaws, the 2019 Phase I Permit's point requirements (225 design phase points and 75 complete phase points) are arbitrary. Baseline requirements that are not tied

to water quality outcomes cannot guarantee that stormwater pollution will be sufficiently controlled. Ecology should tie SSC points requirements to water quality outcomes and require permittees to provide a complete and accurate picture of the local stormwater pollution control landscape within each permitted municipality.

**Recommendation 2:** Shift to a Proportionate Approach for Stormwater Retrofit Requirements in S.5.C.7 and Appendix 12, Whereby Permittees are Required to Restore and Control Stormwater to a Specifically Defined Proportion or Quantity of the Stormwater Problem or Impacted Area Each Year and Each Permit Cycle.

Rather than relying on a point system that is disconnected from a specific and measurable environmental outcome, Ecology should modify the Phase I Permit Section S.5.C.7 and Appendix 12 to focus on projects that will retrofit existing development to treat or control stormwater. Ecology should require permittees to address a specifically defined proportion or quantity of the stormwater problem or impacted area each year, and each five-year permit cycle, by implementing stormwater retrofits and other appropriate projects.

- First, Ecology should review permittees' watershed inventories and assess how many sub-basins or catchment areas there are total per jurisdiction, and/or how many waterbodies are in the jurisdiction, and how degraded they are. If this information is not readily available, Ecology should require each permittee to report this information immediately in their next annual report.

- Second, Ecology should carefully assess permittees watershed prioritization frameworks to understand the number of priority watersheds permittees have identified in their jurisdictions and confirm whether the prioritization is accurate and appropriate, and includes factors like those we highlighted in Recommendation 1.

- Third, Ecology should review the SSC investment approaches permittees have selected in their SMAPs to ensure permittees are implementing effective strategies that will restore degraded waterbodies and meaningfully control stormwater pollution from existing development in the next permit cycle.

For example, Ecology could require permittees to implement projects to control all stormwater flowing to 5% of the problem or impacted area each year of each permit cycle. For example, the problem or impacted area for a permittee could be defined as: (1) all waterbodies, watersheds, or sub-watersheds; (2) all stormwater hotspots; (3) all stream-miles; or (4) all impervious surface areas owned or controlled by the municipality. Using this proportionate approach for existing development, a 5% per year/ 25% per permit cycle requirement would ensure that in 20 years, 100% of the problem or impacted area would be controlled and those targeted waters would be restored.

If this Recommendation were implemented, Ecology might keep the existing full list of 11 qualifying SSC project types but modify S.5.C.7 of the Phase I Permit by requiring permittees to implement whatever number or mix of projects sufficient to address a certain, proportionate amount of their problem or impacted area each permit cycle. With this approach, permittees would have the discretion and flexibility to mix-and-match project types to best address the problems in each of their targeted Existing Development areas. Ecology could require accountability through demonstrable progress in improving water quality each permit cycle by addressing a proportion

of the total target areas, until all target areas are controlled within a reasonable number of permit cycles.

This same approach could be duplicated in a new section of the permit targeting high-quality waters, with the strategy of preserving–or restoring ecosystem function in–a certain proportion of areas predicted to experience future impacts in each permittee's jurisdiction each year and each Permit cycle. This recommendation will be discussed further below in Section 3.

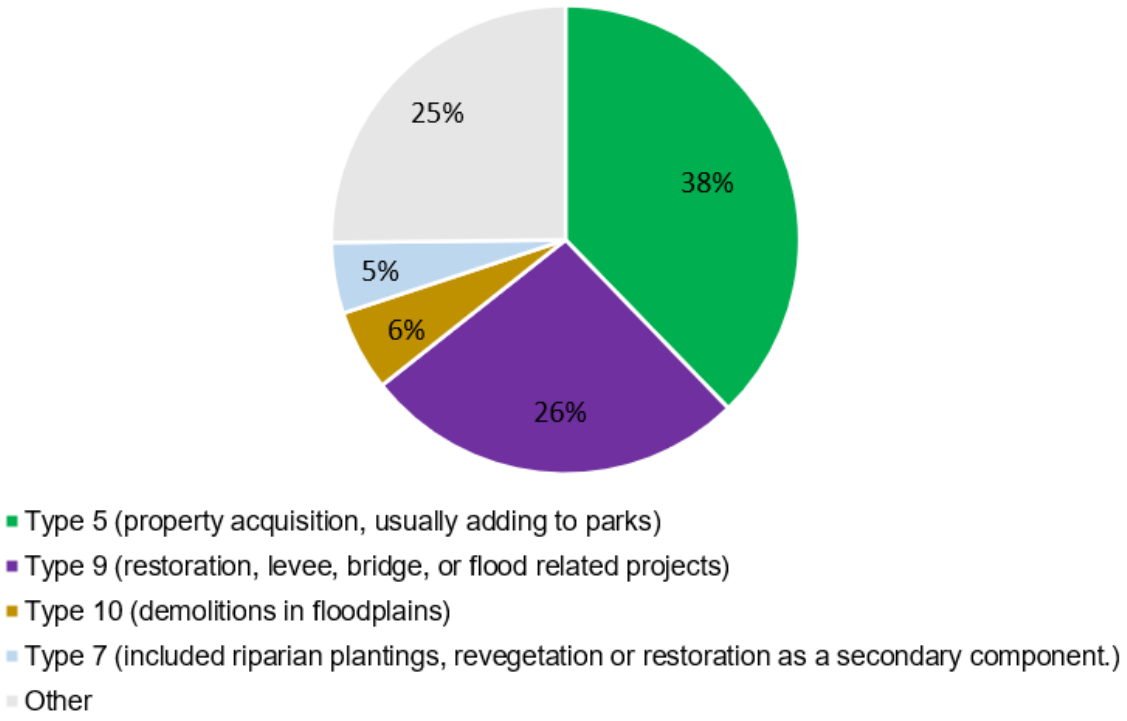
### Finding 3: Municipalities Are "Double-Counting" Projects With no Stormwater Nexus.

**DATA**

In fulfillment of SSC requirements under their Clean Water Act permit, some Phase I's reported a significant number of projects required by another law, performed outside of their stormwater departments, or that were implemented for primarily non-stormwater-related purposes. This is at least in part because the permit allows permittees to invest in projects–including habitat acquisition (SSC Type 5), restoration of riparian buffers (SSC Type 7), restoration of forest cover (SSC Type 8), and floodplain reconnection (SSC Type 9)–that are often implemented with a primary goal or purpose to preserve existing greenspace, prevent future degradation, or repair or offset damage caused by some other non-stormwater-related project or activity.

**Example 1:** Of the 143 total qualifying SSC projects King County reported from 2007 to 2021, 54 of these (37%) were habitat-acquisition projects (SSC Type 5), likely funded and implemented by the County's Department of Natural Resources and Parks (DNRP). Another 38 (26.5%) were restoration, levee, bridge, or flood-related projects that qualify as SSCs (SSC Type 9) because they have a floodplain reconnection component. These were also likely funded and implemented by DNRP. An additional eight projects to permanently remove impervious surface (SSC Type 10) were structural acquisition and demolition projects to protect or remove properties in floodplains. And another seven restoration of riparian buffer projects (SSC Type 7) were primarily projects for other purposes that happened to include riparian plantings, revegetation or restoration as a secondary component. Viewed in this way, this means that at least 107 of King County's 143 qualifying projects (almost 75%) were likely not performed by the stormwater department and didn't have a primary (or any reported) stormwater pollution control purpose. This finding is probably an important part of the explanation for the result reported above that only 40% of King County's projects were in the built environment.

**Figure 11:**
**75% of King County Projects Likely Not Stormwater Focused**




It is also notable that King County originally reported 237 projects from 2007 to 2021. Upon close review of these projects, reviewers concluded that only 143 are SSCs: about 40% of the reported projects were non-qualifying (not SSCs as defined by Ecology), or there was insufficient information about those projects to confirm whether they were completed and/or qualifying.

## FINDINGS AND CONCLUSIONS

The SSC requirement is too broad because permittees can currently fulfill at least some part of their regulatory stormwater pollution control obligations by citing projects that are required by other laws or regulations, implemented by other departments and/or funded for another budget purpose, and projects designed primarily to address or offset some other environmental issue. Furthermore, not all qualifying project types are actually "structural" in nature.

Examples of non-stormwater and non-structural projects that currently qualify for points include but are not limited to:

- Habitat-acquisition projects (SSC Type 5) overseen by Natural Resources and Parks departments that appear to be done primarily to expand the park boundaries or access
- Flood projects that may have a floodplain reconnection component (SSC Type 9) that appear to be motivated primarily by the desire to protect properties from flooding
- Riparian-buffer restoration projects (SSC Type 7) done primarily to revegetate or replant after other capital projects or work is done unrelated to stormwater pollution

- Wetland mitigation projects created as legal credit banks to offset negative impacts to wetlands or other aquatic resources (potentially SSC Type 7)

The above types of projects can currently qualify for SSC points and have been reported by permittees in the past in fulfillment of their Clean Water Act permit requirements, but might be entirely funded, overseen, and driven by departments outside of the municipal stormwater team, and may have little to no nexus with the goals of the stormwater program or underlying permit and regulations.

While SSC Types 5, 7, 8, and 9 can be extremely valuable, including these projects on the SSC list without tying SSC requirements to demonstrable real-world water quality improvements could provide an easy "out" for permittees who might choose to "double-count" these types of projects to satisfy point requirements when the projects have little to no stormwater nexus. As such, Ecology is enabling permittees to attain stormwater regulatory compliance by citing investments that may be unlikely to result in intentional water-quality improvements for stormwater pollution in a targeted area within the permit cycle–if at all.

**Recommendation 3:** Shift to a Proportionate Approach for Preservation Requirements, Whereby Permittees are Required to Address a Specifically Defined Proportion or Quantity of Their Jurisdiction Predicted to Experience Future Development Impacts, Each Year and Permit Cycle.

SSC Types 5, 7, 8, and 9 are valuable projects that can protect and restore the environment. However, combining the two strategies of preservation and restoration in section S.5.C.7 without requiring demonstrable water-quality improvements or a complete picture of the investments being made to control stormwater to a defined area creates too many loopholes.

As described in Recommendation 2, Section S.5.C.7 should focus on requirements to retrofit the built environment to control stormwater pollution from existing development, which could be reframed as an "Existing Development", or "Retrofit," requirement. Then, Ecology should create a new "Future Development", or "Preservation", section of the permit to complement S.5.C.7, requiring permittees to preserve or protect ecosystem function in higher quality waters.

As with Existing Development/Retrofit requirements, Ecology should define a minimum baseline level of effort for Future Development/Preservation stormwater projects, based on a "proportionate" approach like that described in Recommendation 2. Under this new permit section or requirement, permittees could implement a suite of projects of their choice from the same list of project types but for the purpose of preventing impacts to a clearly defined proportion of their jurisdiction where future development poses the most risk of degrading water quality.

### Finding 4: Some Permittees Heavily Rely on Maintenance and Prevention Projects to Fulfill SSC Requirements.

**DATA**

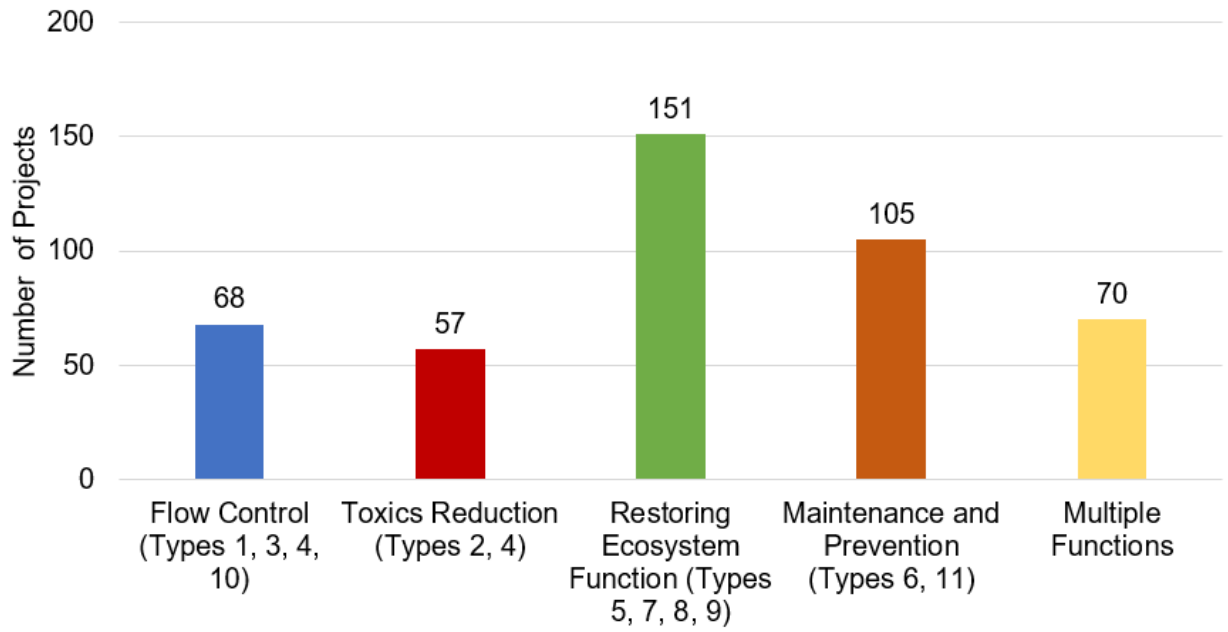
Respectively, 44% and 35% of Seattle and Tacoma's qualifying projects reported between 2007 and 2021 were maintenance and prevention projects by nature or function (SSC Types 6 or 11).[12]

[12] In some instances, reviewers acknowledge that project Types 11 (street sweeping and line cleaning) can provide toxics reduction benefits, or perhaps be considered "pollution prevention" type projects. However, for purposes of this project, reviewers categorized Types 11 as maintenance to reduce the number of categories and differentiate these projects from project types with a single, fixed location.

Both Phase I's indicated they will rely on these types of projects–and specifically, street sweeping–to fulfill future points requirements. Snohomish County is also pursuing obtaining a sweeper and indicated that they will rely on street sweeping projects to fulfill future points requirements.

Some Phase II's have also performed projects that would qualify as SSC Types 6 or 11. For example, 71% of the stormwater projects we identified for Renton would qualify as maintenance of existing facilities (SSC Type 6) under the Phase I Permit. Kent and Bellevue also perform annual street sweeping, and Kent performs annual line cleaning. Overall, more than 23% of all projects had maintenance and prevention functions.

**Figure 12:**
**23% of all Projects by Phase I and II Permittees Were SSC Types 6 and 11**
**(Projects with Maintenance and Prevention Functions)**




## FINDINGS AND CONCLUSIONS

Phase I Permittees are heavily utilizing street sweeping and line cleaning (SSC Type 11), and maintenance with capital construction costs ≥ $25,000 (SSC Type 6) projects, to satisfy their SSC requirements. However, street sweeping and line cleaning are not "structural" in nature, nor do they retrofit the built environment–they are more akin to maintenance or system upkeep or, perhaps, non-structural pollution-prevention measures. Moreover, Section S.5.C.5.10 of the Phase I Permit outlines regular operations and maintenance requirements for Phase I Permittees and could be a more appropriate space to incorporate SSC Type 6 maintenance project requirements.

**Recommendation 4:** Maintenance Projects (SSC Types 6 and 11) Should Have Separate Permit Requirements.

Routine facilities maintenance (SSC Type 6) and line cleaning (SSC Type 11) should arguably already be required by the permit as part of maintaining a functioning stormwater system and implementing all known available reasonable technology to treat and control stormwater. These project types could be folded into separate permit requirements outside of the project list(s) for Existing Development and Future Development requirements. This could occur in section S.5.C.5.10 and S.5.C.7, the Operations and Maintenance requirements of the Phase I and II Permits, respectively.

Further, while street sweeping has value (SSC Type 11), it is not a "structural" stormwater control or "stormwater retrofit." Like maintenance, it must be done regularly to continue to provide a benefit over time. Unlike other SSC projects, street sweeping can occur in multiple and different locations over time.

We therefore recommend:

- SSC Type 6, maintenance with capital construction costs ≥ $25,000, should be removed from the SSC list. Instead, Ecology should craft a new requirement for Phase I's and II's to complete a certain number of backlogged maintenance projects as part of their respective S.5.C.5.10 and S.5.C.7 permit requirements.

- SSC Type 11, line-cleaning programs, should also be removed from the SSC list. Ecology should craft new line-cleaning requirements for both Phase I and II Permittees (as appropriate) as part of their SWMP requirements, building on existing Operations and Maintenance Program requirements.

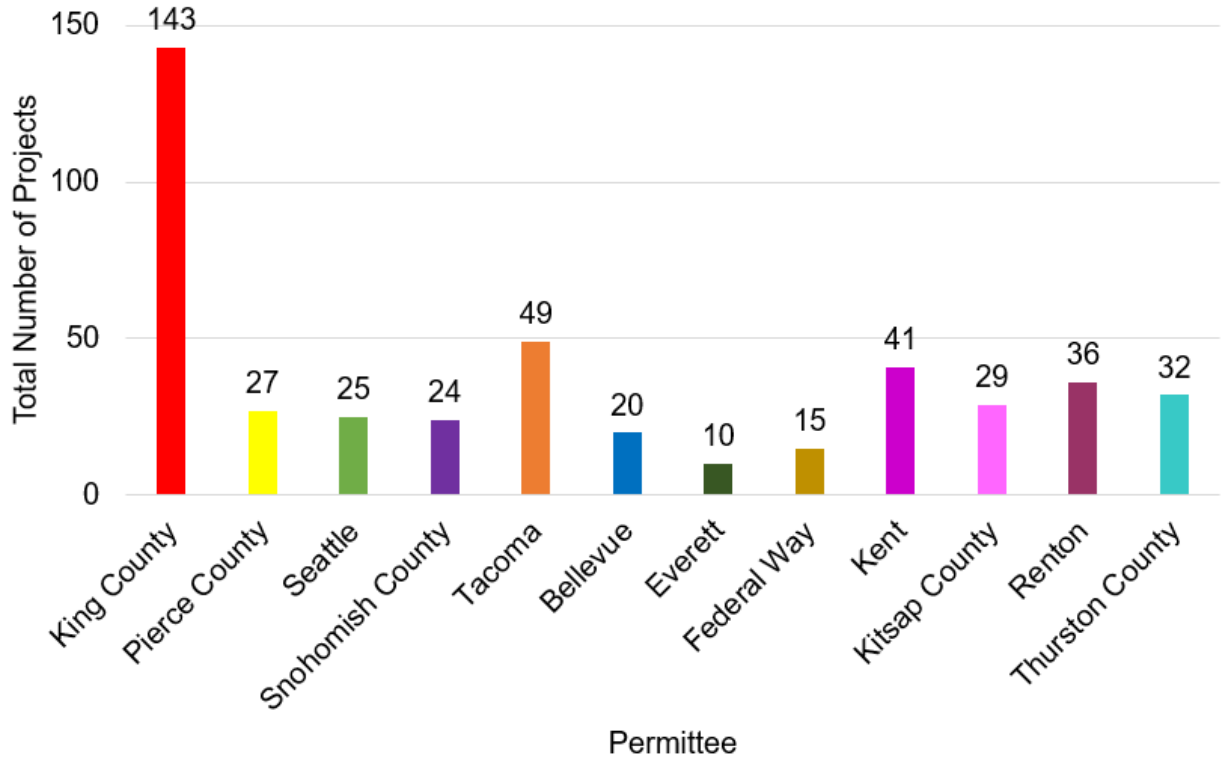
- SSC Type 11, street-sweeping programs, could be included in the SSC list(s) under a "proportionate" approach for Existing Development and/or Future Development requirements, or be separated into a new, distinct permit requirement for all Phase I's and Phase II's with populations exceeding a certain size or density threshold (such as populations exceeding 100,000, or as otherwise appropriate). In carving out new, specific requirements for street sweeping, Ecology could potentially help facilitate a regional or cross-jurisdictional equipment and/or cost-sharing program for sweepers.

**Finding 5: In Some Cases Phase II's Are Doing More SSCs than Phase I's, Despite Having No Baseline SSC Requirements.**

**DATA**

The data shows that all permittees, both Phase I's and II's, are implementing SSC projects. This is despite the fact that Phase II's have no permit requirement to do so

**Figure 13:**
**451 Total Projects Identified, 2007 - 2021**

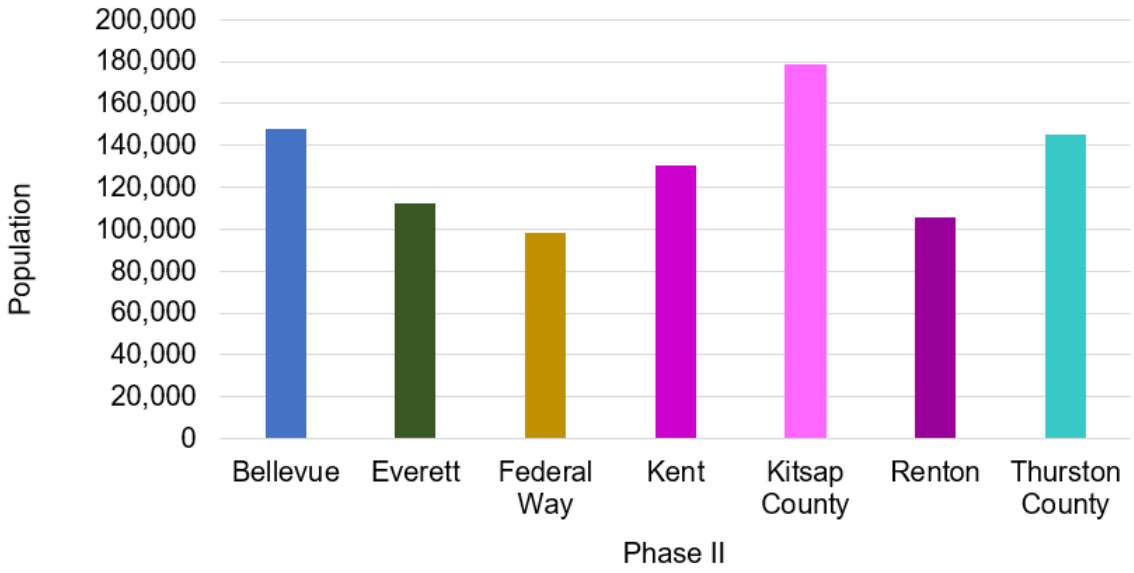



Reviewers not only found that all of the Phase II Permittees reviewed are already implementing SSCs, but additionally in some instances, these large Phase II's are doing more SSC projects than Phase I's are reporting to Ecology.

**FINDINGS AND CONCLUSIONS**

The current populations of the Phase II's researched-Everett, Bellevue, Kent, Kirkland, Federal Way, and Renton, as well as Kitsap and Thurston Counties-meet or exceed the original 100,000-resident regulatory population threshold for designating a Phase I. Though Phase II's do not have any SSC requirements in their permit, many of the Phase II's we surveyed are already implementing SSCs. Some are implementing more SSCs, or more of certain types of SSCs, than Phase I's. The seven Phase II's we surveyed appear to be highly capable of fulfilling an SSC requirement if added to their permit.

**Figure 14:**
**Phase II Population Trends Per State of Washington**
**OFM Report August 2020[13]**




**Recommendation 5:** Expand SSC Requirements to Phase II's.

Although the Phase I and Phase II distinction has governed Ecology's permitting to date, it is no longer tenable for this artificial divide, based on population figures from the 30+ year old 1990 census, to dictate every outcome for every jurisdiction, regardless of existing size or capacity. At a minimum, the larger Phase II's should be required to do SSCs, if not implement all other Phase I Permit requirements.

In 2019, Ecology laid the groundwork for requiring across-the-board investments in SSCs by implementing a requirement for permittees to engage in SMAP planning. Implementation should move forward for both Phase I's and II's pursuant to a proportionate approach for investments in both the built environment and in areas where future development could degrade waters.

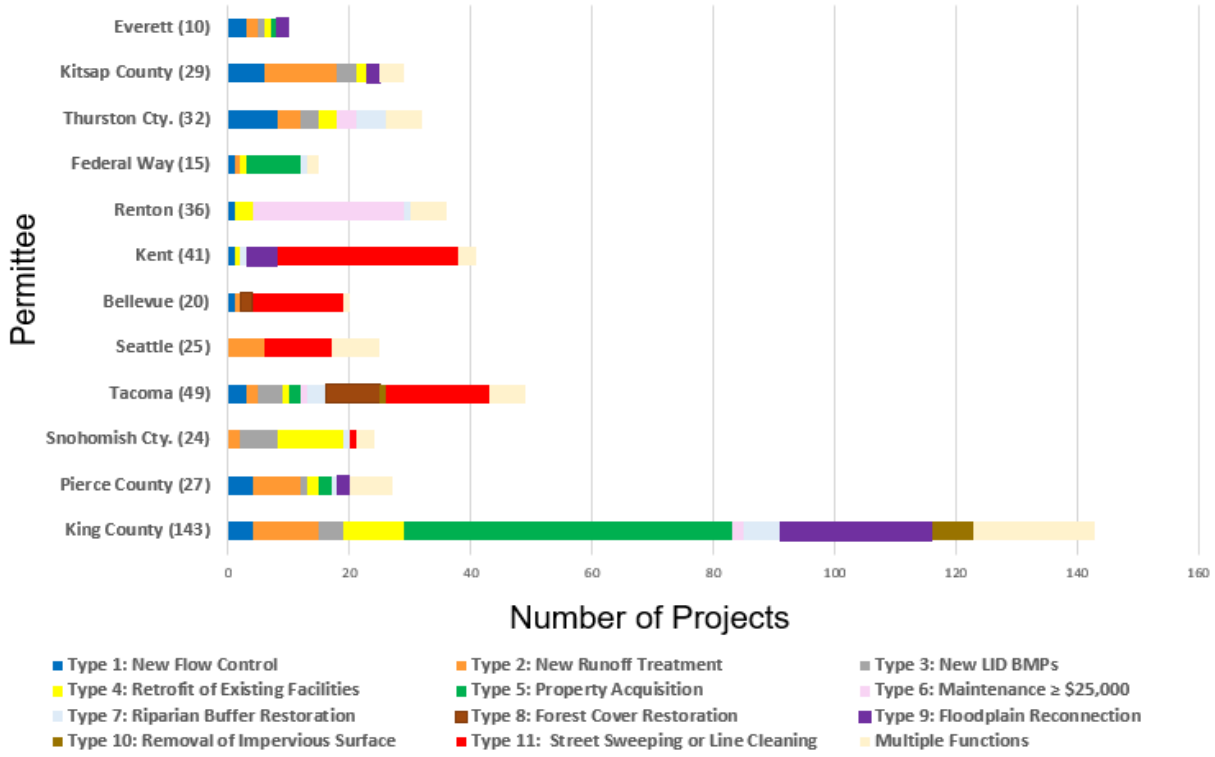
[13] https://www.ofm.wa.gov/sites/default/files/public/dataresearch/pop/april1/ofm_april1_poptrends.pdf

# D. Conclusion

Stormwater remains the number one source of toxic pollution to Puget Sound, but we know how to stop it. We need to stop dumping pollution into our environment, treat and control polluted stormwater runoff before it enters our waterways, and clean up legacy pollution already in our waters. Researchers recently identified the tire chemical derivative, 6-PPD-quinone, has been killing Coho salmon throughout the Pacific Northwest since at least the 1980's. Yet, we've also known for decades that bioretention–a low impact development best management practice (LID BMP) and Structural Stormwater Control we can implement to retrofit the built environment - filters out toxic pollutants and saves Coho.

Our municipalities have done a good job juggling competing priorities with limited resources and implementing stormwater treatment and controls as able. However, municipalities need more funding support, more political support, and more regulatory support in the form of a clear mandate to save Puget Sound. We must strengthen existing Clean Water Act permit requirements by setting out a clear path to do so. Widespread implementation of LID and stormwater retrofits are key to accomplishing this goal.

**Figure 15: All SSC Projects Done By 12 Phase I and II Permittees, By SSC Type, From 2007 - 2021**



In light of the foregoing, reviewers recommend the following:

- Ecology should modify section S.5.C.7 of the Phase I Permit to an "Existing Development"-or "Retrofit"-requirement, focused on controlling polluted stormwater runoff from existing development and restoring waters. The same requirement should apply to Phase II Permittees.
    - For these projects, Ecology should require prioritization of projects or actions in the built environment, in areas with a high or medium prevalence of Urban Runoff Mortality Syndrome (URMS), and in overburdened communities.
- Ecology should shift to a proportionate approach for Retrofit requirements for Phase I's and II's. To control stormwater from existing development, permittees should be required to restore a specifically defined proportion or quantity of the stormwater problem or impacted area within their jurisdiction each year and each Permit cycle. Under this framework, performance should be evaluated based on whether each permittee has restored, and protected, the required proportion or quantity of waters in their jurisdiction each Permit cycle.
    - Permittees could choose to mix and match from the tools in the Permit to restore the required proportion or quantity of waters each Permit cycle.
    - This framework would build on and strengthen current Stormwater Management Action Planning (SMAP) planning requirements.
- Ecology should create a separate "Future Development"-or "Preservation"-requirement for Phase I and II Permittees to implement projects, including current SSC Types 5, 7, and 8, targeted to prevent future water quality degradation and preserve conditions in undeveloped or less developed areas. To prevent or reduce impacts from expected future development, permittees should be required to protect a specifically defined proportion or quantity of the area expected to suffer future impacts each Permit cycle.
- Ecology should create new standalone Phase I and II Permit requirements to perform line cleaning (SSC Type 11) and maintenance projects exceeding $25,000 (SSC Type 6). Street-sweeping programs (SSC Type 11) could be included in the qualifying SSC project list(s) under a "proportionate" approach for Existing Development and/or Future Development requirements, or be separated into a new, distinct permit requirement for certain Phase I's and II's.
- SSC requirements should be expanded to Phase II's.

## Appendix 1: Phase I Progress Report Table

| Projects = qualifying SSCs reported | Seattle | King County | Snohomish County | Pierce County | Tacoma | Total |
|---|---|---|---|---|---|---|
| **Total # of projects, and (projects per capita)[14]** | 25 (1 per 30,440) | 143 (1 per 1,742) | 24 (1 per 15,392) | 27 (1 per 15,785) | 49 (1 per 4,353) | 268 |
| **# and (%) of runoff treatment projects (Type 2) & (projects per capita)** | 14 (56%) (1 per 54,364) | 12 (8%) (1 per 20,758) | 5 (20%) (1 per 73,880) | 13 (48%) (1 per 32,784) | 8 (16%) (1 per 26,662) | 52 (19%) |
| **# and (%) of maintenance projects (Types 6 and 11)** | 11 (44%) | 2 (1%) | 1 (4%) | 0 | 17 (35%) | 31 (12%) |
| **# and (%) of preservation projects (Types 5,7,8, 9)** | 0 | 104 (73%) | 1 (4%) | 6 (22%) | 14 (29%) | 135 (50%) |
| **The data below was calculated using GIS analyses that excluded multi-year maintenance projects performed in the same or undetermined locations (SSC Types 6 and 11). Total Phase I non-repeat multi-year maintenance projects = 244.** | | | | | | |
| **# and (%) in built environment[15]** | 14 (100%) | 57 (40%) | 23 (96%) | 18 (67%) | 24 (69%) | 136 (56%) |
| **# and (%) in High-URMS areas (>40%)[16]** | 12 (80%) | 3 (2%) | 8 (33%) | 0 | 2 (4%) | 24 (10%) |
| **# and (%) in Medium-URMS area (10%-40%)[17]** | 0 | 117 (82%) | 13 (54%) | 20 (74%) | 5 (10%) | 155 (64%) |
| **# and (%) of projects in High EJ[18] areas** | 7 (47%) | 45 (31%) | 3 (13%) | 17 (63%) | 30 (86%) | 102 (42%) |

[14] Jurisdiction population sizes were pulled from a 2020 estimate from OFM for Washington cities and the unincorporated areas of counties covered by the Municipal General Stormwater Permit. Available online at: https://www.ofm.wa.gov/sites/default/files/public/dataresearch/pop/april1/ofm_april1_poptrends.pdf

[15] This data is based on the ESRI 2020 Land Cover Map, available online at: https://www.arcgis.com/apps/mapviewer/index.html?layers=d6642f8a4f6d4685a24ae2dc0c73d4ac

[16] This data is based on the U.S. Fish and Wildlife Services "Coho Urban Runoff Mortality Syndrome in Puget Sound" map, available online at: https://fws.maps.arcgis.com/apps/MapSeries/index.html?appid=5dd4a36a2a5148a28376a0b81726a9a4

[17] This data is based on the U.S. Fish and Wildlife Services "Coho Urban Runoff Mortality Syndrome in Puget Sound" map, available online at: https://fws.maps.arcgis.com/apps/MapSeries/index.html?appid=5dd4a36a2a5148a28376a0b81726a9a4

[18] "EJ" is shorthand for Environmental Justice. This data is based on the Washington Department of Health's Environmental Health Disparities Map, available online at: https://fortress.wa.gov/doh/wtn/WTNIBL/ . High Ranking areas are defined as census tracts ranking 8-9-10.

## Appendix 2: Phase II Progress Report Table

| Projects = qualifying SSCs identified in Budgets, CIPs and CFPs. | Bellevue | Everett | Renton | Kent | Federal Way | Thurston County | Kitsap County | Total |
|---|---|---|---|---|---|---|---|---|
| **Total # of projects, and (projects per capita)[19]** | 20 (1 per 7,405) | 10 (1 per 11,270) | 36 (1 per 2,930) | 41 (1 per 3,182) | 15 (1 per 6,556) | 32 (1 per 4,540) | 29 (1 per 6,174) | 183 |
| **# and (%) runoff treatment projects (Type 2) & (projects per capita)** | 1 (1%) (1 per 148,100) | 4 (40%) (1 per 28,175) | 6 (17%) (1 per 17,583) | 0 | 2 (13%) (1 per 49,170) | 10 (31%) (1 per 14,530) | 15 (52%) (1 per 11,937) | 38 (21%) |
| **# and (%) of maintenance projects (Types 6 and 11)** | 15 (75%) | 0 | 25 (69%) | 30 (73%) | 0 | 3 (9%) | 0 | 73 (40%) |
| **# and (%) of preservation projects (types 5, 7, 8, 9)** | 3 (15%) | 2 (20%) | 1 (3%) | 9 (22%) | 12 (80%) | 5 (16%) | 2 (7%) | 34 (19%) |
| **The data below was calculated using GIS analyses that excluded multi-year maintenance projects performed in the same or undetermined locations (Types 6 and 11). Total Phase II non-repeat multi-year maintenance projects = 118.** | | | | | | | | |
| **# and (%) in built environment[20]** | 4 (67%) | 7 (70%) | 9 (69%) | 11 (85%) | 10 (67%) | 24 (75%) | 28 (97%) | 93 (79%) |
| **# and (%) in High-URMS areas (>40%)[21]** | 3 (50%) | 2 (20%) | 6 (46%) | 4 (31%) | 0 | 0 | 0 | 15 (13%) |
| **# and (%) in Medium-URMS area (10%-40%)[22]** | 2 (33%) | 4 (40%) | 7 (54%) | 9 (69%) | 14 (93%) | 22 (69%) | 20 (69%) | 76 (64%) |
| **# and (%) of projects in High EJ[23] areas** | 2 (33%) | 5 (50%) | 12 (92%) | 12 (100%) | 12 (100%) | 0 | 1 (3%) | 44 (37%) |

[19] Jurisdiction population sizes were pulled from a 2020 estimate from OFM for Washington cities and the unincorporated areas of counties covered by the Municipal General Stormwater Permit. Online at: https://www.ofm.wa.gov/sites/default/files/public/dataresearch/pop/april1/ofm_april1_poptrends.pdf

[20] This data is based on the ESRI 2020 Land Cover Map, available online at: https://www.arcgis.com/apps/mapviewer/index.html?layers=d6642f8a4f6d4685a24ae2dc0c73d4ac

[21] This data is based on the U.S. Fish and Wildlife Services "Coho Urban Runoff Mortality Syndrome in Puget Sound" map, available online at: https://fws.maps.arcgis.com/apps/MapSeries/index.html?appid=5dd4a36a2a5148a28376a0b81726a9a4

[22] This data is based on the U.S. Fish and Wildlife Services "Coho Urban Runoff Mortality Syndrome in Puget Sound" map, available online at: https://fws.maps.arcgis.com/apps/MapSeries/index.html?appid=5dd4a36a2a5148a28376a0b81726a9a4

[23] "EJ" is shorthand for Environmental Justice. This data is based on the Washington Department of Health's Environmental Health Disparities Map, available online at: https://fortress.wa.gov/doh/wtn/WTNIBL/ . High Ranking areas are defined as census tracts ranking 8-9-10.