THURSTON COUNTY

Green Cove Creek Subbasin Stormwater Management Action Plan

Review Draft January 2023

THURSTON COUNTY STORMWATER UTILITY

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1. INTRODUCTION

The *2019 Western Washington Phase II Municipal Stormwater Permit* (Permit) requires the County to implement a stormwater planning program to inform and assist in the development of policies and strategies to protect the beneficial uses of its receiving waters. The County has invested in efforts to inform and improve its collective understanding of stormwater-related impacts and effectiveness of the stormwater management programs and practices. These efforts include work that went into developing the *Green Cove Creek Subbasin Stormwater Management Action Plan* (SMAP) in accordance with the Permit's Special Condition S5.C1.d.

1.1 Goals and Objectives

SMAP process focuses on addressing cumulative impacts from development in a basin rather than on single site or subdivision impacts. SMAP helps answer:

1) How can the County most strategically address existing stormwater problems?
2) How can the County meet its future population and density targets while also protecting and improving conditions in receiving waters?

1.2 Approach

The SMAP process uses available information and professional judgment to:

1) Assess the County's receiving water conditions, including the County's municipal storm sewer discharges' influences on each of the receiving waters;
2) Prioritize a narrowed list of receiving waters to identify which can most likely benefit from the implementation of stormwater management strategies in candidate municipal separate storm sewer system (MS4) catchments; and
3) Develop a SMAP for a high priority catchment area.

In undertaking this process, the County:

- Reviewed existing watershed plans, the *Science to Policy* project and Thurston Regional Planning Council's (TRPC) *Thurston County Current and Future Basin Conditions Assessment Report* (*2021 Basin Conditions Report*) to see how they line up with the Permit's SMAP requirements[1]
- Conducted the receiving water assessment using 2045 projections from the *2021 Basin Conditions Report* to evaluate the County's stormwater management influence level from its MS4 outfall catchment areas
- Screened out MS4 catchments with a low stormwater management influence and/or falling within *degraded* or *highly degraded* categories based on 2045 basin condition projections.

[1] The Permit allows for the use of existing information.

TRPC's *2021 Basin Conditions Report* describes the methodology developed for assessing a basin's overall heath. Working with local jurisdictions and stakeholder outreach, TRPC developed a rating system for the County's local river, stream, and lake basins. *Table 1.1* depicts the report's basin condition rating system which uses a variety of factors that affect stream health. Calculations excluded waterbodies from the total area when calculating percentages. Each category received an assigned score from one to five – with one representing *intact* and five equaling *very degraded* conditions.

Table 1.1: 2021 Basin Conditions Report's Basin Conditions Criteria

Basin Condition	Urbanization	Basin and Riparian Condition		Score
	Percent Impervious Land Cover	Percent Forest Cover*	Percent Intact Riparian Cover	
Intact	<2%	>80%	>90%	1
Sensitive	2-10%	65-80%	75-90%	2
Impacted	10-25%	45-65%	60-75%	3
Degraded	25-40%	30-45%	30-60%	4
Highly Degraded	>40%	<30%	<30%	5

*Excludes some native land covers – notably prairie open habitat – prevalent in many Thurston County basins.

The 2045 basin condition relies on projections of future impervious cover and basin forest cover. The projection uses estimates of developable land and future residential densities from Thurston Regional Planning Council's land capacity model under current zoning. The basin health project assumes no change in the basin's riparian land cover. It does not take into consideration the effects of future restoration and conservation efforts.

The County assessed the level of stormwater management influence (i.e., low, moderate, and high) for each MS4 outfall as well as at the MS4 catchment scale. The County used Light Detection and Ranging (LiDAR) data to delineate areas with the potential to capture and discharge runoff to a County outfall(s).[2] Catchments with *low stormwater management influence* were those with low hydrologic influence AND low expected pollutant load as defined as follows.

Low hydrologic influence catchments discharge directly to either:

- a flow control exempt receiving water, OR
- an ephemeral/seasonal receiving water, OR
- a receiving water primarily influenced by groundwater flows.

Low pollutant load catchments:

- receives *Basic* stormwater runoff treatment, OR

[2] In instances where a catchment contained more than one County outfalls, the catchment's stormwater management influence level equated to the arithmetic mean (i.e., average) of all the catchment's outfalls' influence levels.

- has 60%[3] of its area collectively influence from any one or more of the following land use designations:
  - low density residential, AND/OR
  - parks, greenways, open space (County or State); wildlife areas; and/or in conservation (e.g., land trust ownership)

  In addition, *low pollutant load* did not include catchments with roads that exceed the following 2045 projected thresholds (unless the catchment received *Basic* stormwater treatment):
  - annual average daily traffic (AADT) up to 7,500
  - fully and partially controlled limited access highways with AADT up to 15,000

This process revealed six candidate receiving waters that underwent further evaluation during the prioritization ranking process. The prioritization work benefited from using a County-developed SMAP web-based geodata analysis tool, the *Thurston County Equity Index*[4], reviewing existing County basin plans, and insights gleaned from staff's local knowledge. The result identified the following top three candidates receiving waters: 1) Green Cove Creek[5], 2) Mud Bay, 3) and Black Lake.

Based on the work described above, the County set out to develop a SMAP for Green Cove Creek's MS4 catchments capitalizing on the work previously done as part of the December 1998 *Green Cove Creek Comprehensive Drainage Basin Plan*.

1.3 Green Cove Creek Subbasin Characterization

The Green Cove Creek subbasin encompasses incorporated portions of the City of Olympia, which include the subbasin's headwaters, and developing unincorporated areas of Thurston County, including portions of the City of Olympia's Urban Growth Area (*Map 1*[6]). The Green Cove Creek drainage area encompasses an area of approximately 4.3 square miles. It includes Grass Lake wetlands and Green Cove Creek which drains to Eld Inlet, a shellfish growing area. The subbasin, predominately till soil and areas of high groundwater, contains extensive wetlands and provides habitat for salmonid and resident fish species. The subbasin falls within Water Resource Inventory Area (WRIA) 13 – a high priority for freshwater habitat restoration and conservation. The *Green Cove Creek Comprehensive Drainage Basin*

[3] Used as starting point for the land use elements to assess whether we needed to increase or decrease the percentage in order to get to the 10-15 candidate catchment target.
[4] A spatial mapping tool, developed by the University of Washington-Tacoma, to assist in identifying areas where residents could have increased risk and decreased opportunities based on five different datasets: Livability, Economic Stability, Environment, Education, and Walkability.
[5] Green Cove Creek, not previously identified during the receiving water assessment, came to light during the review of existing basin plans. Had we obtained the 2045 AADT stream crossing projections in time to use during the receiving water assessment, one of its MS4 catchments would have been flagged as high stormwater management influence.
[6] Note for reviewers – the referenced maps, still in production, were not available for inclusion in this review draft.

Plan notes planning and construction of a substantial amount of new commercial and high-density residential development. The subbasin has a moderate equity burden per the *Thurston Equity Index*.

The geographic scope of this SMAP focuses on the County's MS4 catchment areas residing within the unincorporated portions of the subbasin. The *2021 Basin Conditions Report* shows *impacted* levels of basin heath, currently and projected to 2045. Green Cove Creek's MS4 catchments collectively comprise 517 acres, with 98% of this area residing within the County's municipal stormwater permit boundary. The lower catchment resides fully outside the urban growth area (UGA), with approximately half of the upper catchment falling within UGA (*Map 2)*.

Discharging to seven outfalls and three discharge points, the County's stormwater conveyances total just under 6,500 feet – ~87% piped. Currently none of the County's MS4 discharges receive treatment or flow control. The down-creek catchment has a low calculated stormwater management influence level, with upper catchment (which includes a high AADT stream crossing at Kaiser Road NW) possessing a moderate level.

2. ACTION PROPOSALS

These proposals contain a package of actions, in addition to the Permit's existing programs, designed to address discharges from the County's municipal storm sewer into Green Cove Creek. The actions aim to accommodate future growth and development while improving degraded water quality conditions due to harms caused by past development. Each proposed action includes a brief description of short- and long-term actions and the benefit provided.

Proposal 1: Capital Facilities - Water Quality and Flow Control Retrofits

Description: *Map 3* depicts eight (8) sites where County-owned stormwater outfalls or discharge points direct flows to Green Cove Creek. All eight locations predate current runoff treatment and flow control standards, so the infrastructure conveys untreated runoff from roads and subdivisions directly to Green Cove Creek.

Short-term Actions:

1a. Install water quality BMPs at Country Club Road's intersection with Green Cove Creek. Thurston County Public Works is progressing an emergency project to address a failed culvert at this intersection. As part of this project going to construction by 2025, the Storm and Surface Water Utility can provide supplemental project funding to treat roadway runoff.

1b. Perform a predesign study to evaluate water quality and flow control retrofit feasibility at Kaiser Road's intersection with Green Cove Creek. Regional transportation planning efforts project 7,500 AADT along Kaiser Road by 2045, and existing drainage infrastructure serving this half-mile of County roadway lacks runoff treatment

technology. The Storm and Surface Water Utility can perform a feasibility study to evaluate roadway runoff treatment and flow control opportunities.

Long-term Actions:

1c. Perform feasibility study to evaluate additional treatment and flow control retrofit opportunities for the remaining County-owned outfalls or discharge points in the Green Cove Creek subbasin. A feasibility study can help triage opportunities based off treatment and flow control potential.

1d. Pending outcome of 1b's and 1c's feasibility studies' results, the County may add capital facilities projects to the County's future Capital Improvement Plan.

Benefit: Capital runoff treatment retrofits may reduce pollutant loading in Green Cove Creek by removing pollutants originating in County road conveyance systems. Adding flow control to project scopes also helps mitigate high flows that could degrade natural drainage courses.

Proposal 2: Stormwater management-related climate adaptation

Description: Evaluate opportunities to incorporate actions in the *Thurston County Climate Mitigation Plan* (2020) and *Thurston Climate Adaptation Plan* (2018) into stormwater planning, infrastructure design, and management. The Thurston Climate Mitigation Plan provides a framework for climate mitigation in Thurston County.

Short-term Action:

2a. Using resources previously developed for Thurston County by the University of Washington Climate Impact Group, conduct a pilot to analyze potential and projected climate impacts and risks to public and private infrastructure, including County MS4 infrastructure within the subbasin's catchments.

2b. Provide training to Storm and Surface Water Utility staff on the T*hurston County Climate Mitigation* and *Climate Adaptation Plans* to evaluate and inform stormwater facility design and management decisions.

Long-term Action:

2c. Pending the findings of 2a, if warranted, develop recommendations for catchment-specific stormwater design and management considerations to adapt to projected change in design storms.

Benefit: Evaluate potential risks to public and private infrastructure, public health and safety, and aquatic resources to inform stormwater adaptive management-related actions.

Proposal 3: Bacteria pollution, identification, & correction

Description: Identify and eliminate illicit sources of bacteria from human and domesticated animal feces that find their way into the County's MS4.

Short-term Actions:

3a. Investigate remaining property gaps identified during the 2020 Green Cove Clean Water Pollution Identification and Correction (PIC) Project. Informed by source tracing efforts, review septic records and perform septic system surveys in neighborhoods considered likely sources of bacterial discharges to MS4s.

3b. Develop and provide targeted outreach and technical assistance to support implementation of identified correction actions.[7]

Long-term Action:

3c. Every three years, conduct segmented bacterial monitoring (*Map 4*) of Green Cove Creek to narrow search for MS4 discharges with consistent elevated sources of bacterial contamination to inform the targeting of MS4 conveyance source tracing and pollution correction efforts (e.g., failing septic systems, pet and livestock waste, homeless encampments).

Benefit: Reduced public health hazards and commercial shellfish harvesting restrictions or closures.

Proposal 4: Nutrient pollution, identification, & correction

Description: Addresses sources of nutrients from human activities that can potentially find their way into the County's MS4.

Short-term Actions:

4a. Determine source(s) of elevated levels phosphorous revealed by ambient monitoring data and to what extent, if any, MS4 discharges contribute. Evaluation should account for natural sources (e.g., wetlands are abundant in the basin).

4b. If MS4 source tracing reveals anthropogenic sources, develop and deploy targeted pollution prevention actions (e.g., education and technical assistance to property owners and professional landscapers; seasonal fall street sweeping to pick up leaf debris).

Long-term Action:

4c. Pending the outcome of 4b, evaluate the feasibility for implementing targeted stormwater retrofits for phosphorous control.

Benefit: Reduced impairments to aquatic health.

[7] Examples of potential supporting actions could include homeowner education on maintaining septic systems, pet waste cleanup behavior change campaign, and additional pet waste stations.

Proposal 5: Enhance resolution of MS4 outfall catchment delineations

Description: The SMAP's MS4 outfall catchment delineations relies on LiDAR. As a result, it can only delineate areas with the *potential* to capture and discharge runoff to a County outfall (or group of outfalls) rather than portraying a field-verified capture area for each outfall.

Short-term Action:

5a. Conduct a pilot effort in Green Cove Creek Catchment 1 to generate a field-verified map of the actual areas where runoff gets captured and routed to each of the County's MS4 outfalls through a desktop and windshield survey.

Benefit: Reduce Illicit Discharge Detection and Elimination (IDDE) response times as well as further enhance the County's to ability to target and tailor its stormwater-related management programs and land management strategies to achieve area-specific objectives. Increased MS4 network resolution would significantly improve outputs to reflect modeled impacts more accurately (e.g., TMDLs) as well as projected realized benefits through implemented actions (e.g., TMDL water cleanup plans).

3. IMPLEMENTATION SUMMARY

Table 3.1 provides a summary of the proposed capital, programmatic, and adaptive management actions, likely and potential funding sources, and expected implementation timeframe (i.e., short-term vs. long-term). Some will require further refinement depending on the nature of the proposal. Programmatic actions require incorporation into Department and Division annual work plans and budgets. Capital facility projects must be included in the County *Capital Facilities Plan* which in turn requires adoption as part of the County's *Comprehensive Plan*. In setting priorities, the County balances stormwater projects needs against other capital improvement priorities (e.g., roads, parks, sewer, and water).

Table 3.1: Proposed Actions

Proposal Reference	Action	Action Type	Candidate Funding Source(s)	Implementation Timeframe
1a	Implement runoff treatment BMP's at Country Club Road's Green Cove Greek's crossing	Capital	Storm and Surface Water Utility Fees (capital fund)	Project scheduled for construction by 2025 (short-term).
1b	Perform runoff treatment and flow control retrofit feasibility study at Kaiser Road's Green Cove Creek's crossing	Capital	Storm and Surface Water Utility Fees (capital fund)	Within six years (short-term)
1c	Perform treatment and flow control feasibility and prioritization study for remaining County outfalls/discharge points	Capital	Storm and Surface Water Utility Fees (capital fund)	7-20 years (long-term)

1d	Pending outcome of 1b's and 1c's feasibility study's results, add capital facilities projects to the County's future Capital Improvement Plan.	Adaptive Management	Storm and Surface Water Utility Fees (capital fund); grants	7-20 years (long-term)
2a	Using resources previously developed for Thurston County by the University of Washington Climate Impact Group, conduct a pilot to analyze potential and projected climate impacts and risks to public and private infrastructure, including County MS4 infrastructure within the subbasin's catchments.	Programmatic	Storm & Surface Water Utility Fees (program fund)	Within six years (short-term)
2b	Provide training to Storm and Surface Water Utility staff on the Thurston County Climate Mitigation and Climate Adaptation Plans to evaluate and inform stormwater facility design and management decisions.	Programmatic	Storm & Surface Water Utility Fees (program fund)	Within six years (short-term)
2c	Pending the findings of 2a, if warranted, develop recommendations for catchment-specific stormwater design and management considerations to adapt to projected change in design storms.	Adaptive Management	Storm & Surface Water Utility Fees (program fund)	7-20 years (long-term)
3a	Investigate remaining property gaps identified during the 2020 Green Cove Clean Water PIC Project (bacteria)	Programmatic	Foundational Public Health Services Account	Within six years (short-term)
3b	Provide targeted outreach and technical assistance to support implementation of identified bacterial illicit discharge correction actions	Adaptive Management	Foundational Public Health Services Account; Storm & Surface Water Utility Fees (program fund)	Within six years (short-term), if triggered by event
3c	Periodic segmented bacterial monitoring of Green Cove Creek to narrow search for illicit MS4 bacteria sources	Adaptive Management	Foundational Public Health Services Account; Storm & Surface Water Utility Fees (program fund)	Every two (2) years perform wet and dry season E. coli bacteria monitoring of established monitoring stations on Green Cove Creek. Collect five samples from each station on different days for comparison to State water quality standards.

4a	Determine source(s) of elevated levels phosphorous revealed by ambient monitoring data and to what extent, if any, MS4 discharges contribute	Programmatic	Storm & Surface Water Utility Fees (program fund)	Within six years (short-term)
4b	If MS4 source tracing reveals anthropogenic phosphorous sources, develop and deploy targeted pollution prevention actions	Adaptive Management	Storm & Surface Water Utility Fees (program fund); Road Funds	Triggered pending outcome of study
4c	Pending outcome of 4b, evaluate the feasibility for implementing targeted stormwater retrofits for phosphorous control.	Adaptive Management	Storm and Surface Water Utility Fees (capital fund)	7-20 years (long-term)
5a	Conduct a pilot effort in Green Cove Creek Catchment 1 to generate a field-verified map of the actual areas where runoff gets captured and routed to each of the County's MS4 outfalls through a desktop and windshield survey.	Programmatic	Storm & Surface Water Utility Fees (program fund)	Within six years (short-term)

4. FUNDING SOURCES

Funding for financing implementation of the action proposals fall into the following two categories: Local sources and grants. Existing local sources include storm and surface water utility fee revenue, road funds, and County general funds. Grants include a variety of federal and state programs. Historically, stormwater-related funding needs come from Storm and Surface Water Utility fee revenue, road funds, and grants.

4.1 Local Revenue Sources

Storm and Surface Water Utility Fees

This enterprise revenue source comes from fees collected from property owners residing in unincorporated Thurston County. Rates vary and reflect how much a property contributes to stormwater runoff as well as whether the property reside within the County's Municipal Stormwater Permit boundary. Schools, businesses, and places of worship may qualify for rate credits to reduce stormwater fees. The fee includes a *base rate* and a *capital rate*. The *stormwater base rate* pays for all stormwater utility services except those related to construction projects. The *stormwater capital rate* helps fund the construction of stormwater utility projects prioritized and approved by the Thurston County Board of Commissioners.

Road Funds

Funding for transportation-related drainage improvements and maintenance largely falls to the to the responsibility of the Public Works Department Roads Division. Road projects may often trigger associated drainage, runoff treatment, or flow attenuation improvement. The Roads Division's responsibilities include stormwater-related operations and maintenance associated with their transportation facilities.

County General Fund

The *General Fund* supports the County's basic operation and accounts for everything not accounted for in another fund (i.e., specific revenue sources limited to funding a particular purpose). Thus, the General Fund represent the one truly flexible fund as it can provide funding for any legal county purpose. Property and sales taxes represent the largest source of revenue for the General Fund.

4.2 Grants

The Green Cove Creek Subbasin SMAP improves the County's ability to complete to limited grant funding. The County has been successful in obtaining state and federal grants in the past. Most grants require some amount of local matching funds, which may sometimes take the form of in-kind services. While grants can help leverage finite local revenue funding, their uncertainty makes them unreliable to long-term planning and ongoing programmatic needs.

4.3 External Revenue Sources

Foundational Public Health Services Account

Created by the Washington State Treasury, the funds may only be spent after appropriation. Among the allowable uses includes funding of foundational health services through the government health system, including the County's Public Health and Social Services Department.

5. ASSESSMENT AND FEEDBACK PROCESSES

5.1 Implementation Review

SMAP reviews will occur concurrently with the County's annual review and update of its *Stormwater Management Program Plan*. More in-depth reviews will occur in conjunction with the Permit's five-year reissuance cycle. These reviews, led by the County's Stormwater Program Coordinator, constitute ongoing efforts to assess implementation progress and continually improve the effectiveness of the County's stormwater management programs.

The County will track the following indicators to assess SMAP implementation progress and the effectiveness of its actions:

1) Running total on the number of Green Cove Creek's outfalls that receive runoff treatment prior to discharge (or determinations that treatment retrofit is infeasible for a given site).
2) Annual number and location of IDDEs related to sources of bacteria from human and domesticated animal feces into the County's MS4

3) Number and location of wet and dry season E. coli bacteria State water quality standard exceedances reported biennially (i.e., every two years) at the County's Green Cove Creek's monitoring stations

Should MS4 source tracing reveal anthropogenic phosphorus sources (i.e., P*roposed Action 4a*), the County will also annually track the number and location of IDDEs related to anthropogenic sources of phosphorous.

5.2 Adaptive Management

SMAP *Table 3.1* summarizes the proposed SMAP actions that, by their very nature, will assist in informing and guiding the County's approach through an adaptive management process. Through these *adaptive managemen*t *actions*, as well as gaging progress from indicator tracking, the County will take an intentional approach to considering adjustments to the SMAP's capital, programmatic, and policy actions. These adjustments will also consider changes in the subbasin and emerging trends; lessons learned and challenges encountered; and advancements in stormwater management technologies, procedures, and practices.

ACRONYMS & ABBREVIATIONS

AADT	Annual Average Daily Traffic
IDDE	Illicit Discharge Detection and Elimination
LiDAR	Light Detection and Ranging
MS4	Municipal Separate Storm Sewer System
Permit	2019 Western Washington Phase II Municipal Stormwater Permit
PIC	Pollution Identification and Correction
SMAP	Stormwater Management Action Plan
TMDL	Total Maximum Daily Load
TRPC	Thurston Regional Planning Council
WRIA	Water Resource Inventory Area

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