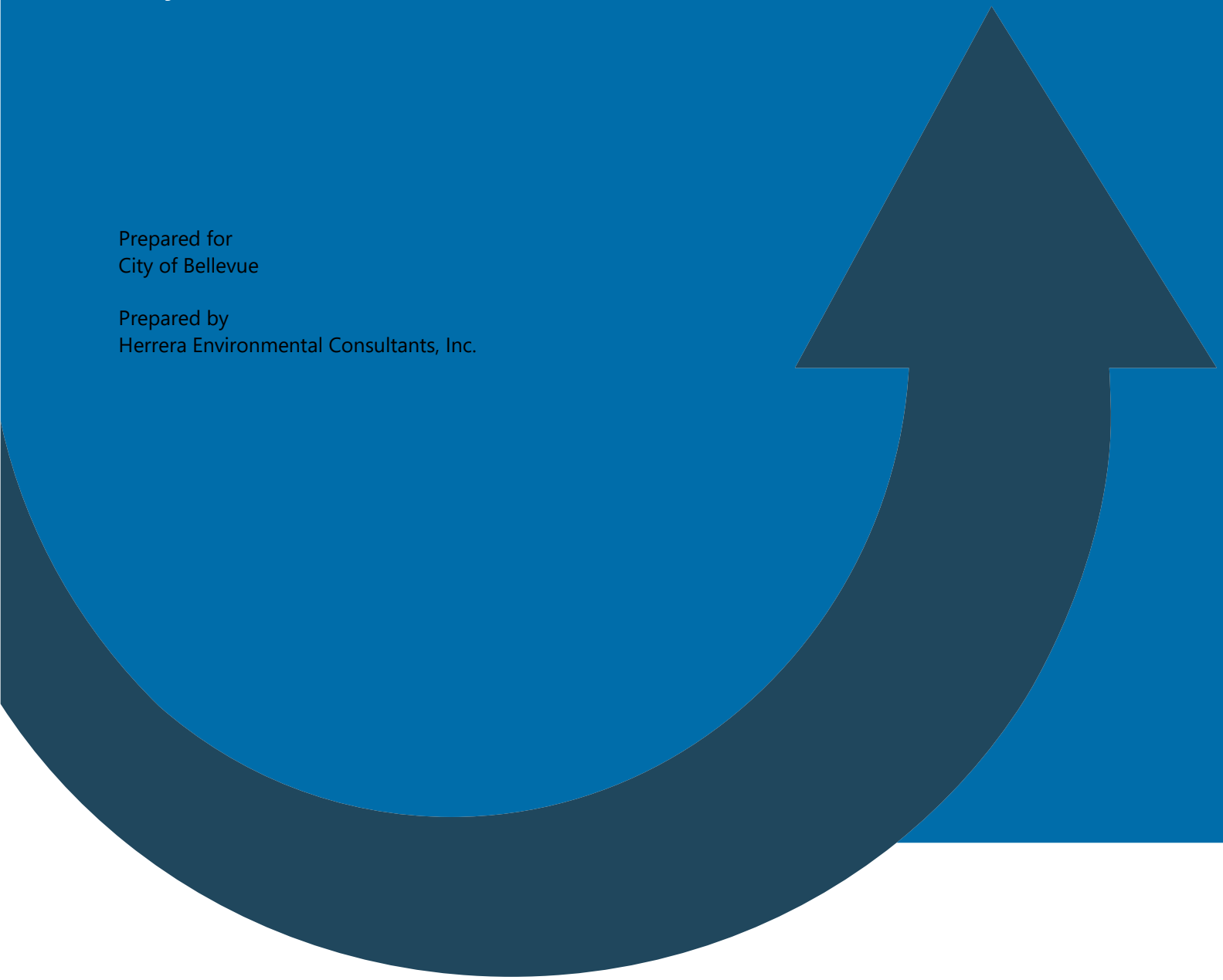
Stormwater Management Action Plan

City of Bellevue



Prepared for
City of Bellevue

Prepared by
Herrera Environmental Consultants, Inc.

HERRERA
Science + Planning + Design

Note:
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Stormwater Management Action Plan

City of Bellevue

Prepared for
Don McQuilliams and John Sizemore
City of Bellevue
450 110th Avenue Northeast
Bellevue, Washington 98004

Prepared by
Herrera Environmental Consultants, Inc.
2200 Sixth Avenue, Suite 1100
Seattle, Washington 98121
Telephone: 206-441-9080

FINAL
March 10, 2023

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PURPOSE

The City of Bellevue (City) Stormwater Management Action Plan (SMAP) was prepared to meet the requirements of S5.C.1.d.iii of the 2019–2024 Western Washington Phase II National Pollutant Discharge Elimination System (NPDES) Stormwater Permit (Phase II Permit) issued by the Washington Department of Ecology (Ecology).

The Plan is organized according to the 2019–2024 Phase II Permit requirements and identifies the following for the high priority catchment located in the Kelsey Creek watershed:

- A description of the stormwater facility retrofits needed for the area, including the best management practice (BMP) types and preferred locations.
- Land management/development strategies and/or actions identified for water quality management.
- Targeted, enhanced, or customized implementation of stormwater management actions related to 2019–2024 Phase II Permit sections within S5, including:
  - Illicit discharge detection and elimination (IDDE) field screening,
  - Prioritization of Source Control inspections,
  - Operations and Maintenance (O&M) inspections or enhanced maintenance, or
  - Public Education and Outreach behavior change programs.
- If applicable, identification of changes needed to local long-range plans, to address SMAP priorities.
- A proposed implementation schedule and budget sources for:
  - Short-term actions (i.e., actions to be accomplished within six years), and
  - Long-term actions (i.e., actions to be accomplished within seven to 20 years).
- A process and schedule to provide future assessment and feedback to improve the planning process and implementation of procedures or projects.

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BACKGROUND

The City completed the Bellevue Stormwater Management Action Planning Watershed Prioritization technical memorandum on June 24, 2022 (Herrera and Jacobs 2022a). This SMAP was developed based on the findings of the prioritization process described in the technical memorandum.

Concurrent with the timeframe for completing the SMAP process, the City is developing a Watershed Management Plan (WMP) that will focus on improving the health and condition of the City's streams using a toolbox of holistic storm and surface water management practices. The WMP will direct investments to high-priority watersheds, providing measurable environmental benefits to stream health within a shorter time frame than past or current approaches. The WMP will also help prevent further degradation in non-priority watersheds. The WMP will include an implementation plan with recommended projects, policies, programs, and operational plans to meet performance goals for Bellevue's streams and to provide multiple benefits that help advance City objectives across departments and programs.

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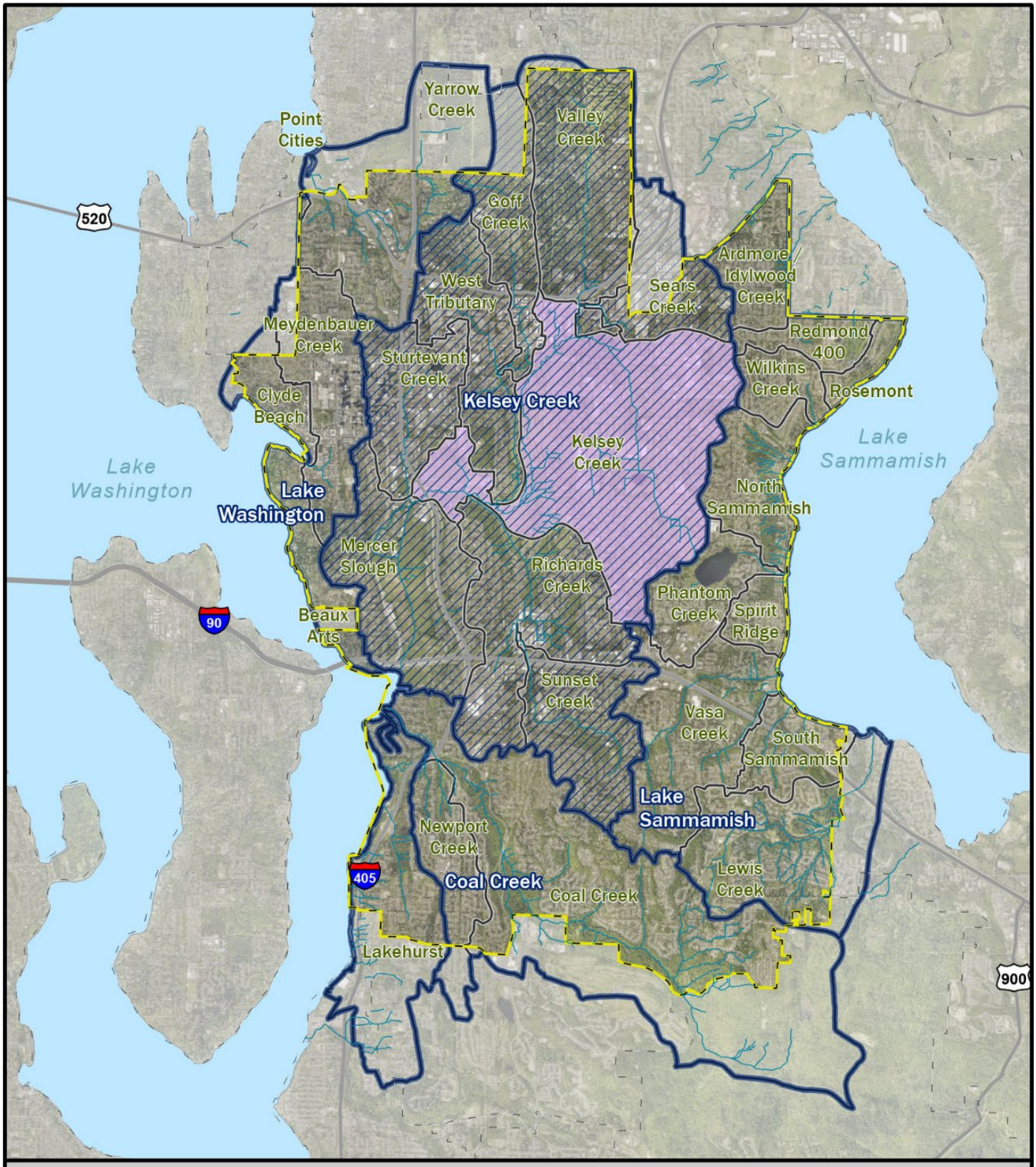
WATERSHED PRIORITIZATION SUMMARY

The City's stepwise process for developing the WMP included initial (Jacobs and Herrera 2020) and revised (Jacobs and Herrera 2022b) watershed prioritizations to identify which subbasins within the City's watersheds would have the quickest positive response to rehabilitation efforts, with the goal of maximizing return on the City's investments in stream health. Based on the results of these prioritizations, subbasins within each of the City's four major watersheds – Coal Creek, Greater Kelsey Creek, the Lake Sammamish tributaries within Bellevue, and the small Lake Washington Tributaries – were assigned one of three management strategies: Protect, Improve, or Sustain. In addition to informing the City's watershed planning process, the final assignments of these management strategies also provided the technical basis for the City's watershed prioritization under the SMAP process. Only the subset of subbasins that were assigned the "Improve" management strategy were identified as candidates for the City's SMAP.

The following subsections describe how this information was used to prioritize a specific subbasin and catchment area, respectively, for the City's SMAP.

Kelsey Creek Mainstem Subbasin

Based on the prioritization process described above, the City selected the Kelsey Creek Mainstem subbasin to fulfill the SMAP requirements. As shown in Figure 1, this subbasin is located within the Greater Kelsey Creek Watershed in the center of the City and connects the six upstream subbasins in this watershed to Mercer Slough (Jacobs and Herrera 2021). Land use in the subbasin is predominantly single family residential with large areas of parks, multi-family residential, and commercial/office. A high percentage (46 percent) of the subbasin was developed prior to 1975 when no stormwater management was required. Water quality impairment has been documented in Kelsey Creek from several common stormwater pollutants. Based on these considerations, the primary limiting factors in the Kelsey Creek Mainstream Subbasin were identified as "Stormwater Runoff from Impervious Surfaces" and "Pollutant Loading". In addition, "Road Culverts and Other Physical Barriers" was identified as a secondary limiting factor (Herrera and Jacobs 2022b).



Legend

- Main Watershed Boundaries
- Subbasin Boundaries
- Kelsey Creek Watershed
- Kelsey Creek Subbasin
- Bellevue City Limit
- Other Jurisdictions
- Streams
- Highway

Figure 1. Kelsey Creek Watershed Overview Map, City of Bellevue.

N

0 3,500 7,000 14,000 Feet

Jacobs HERRERA

King County Aerial (2019)

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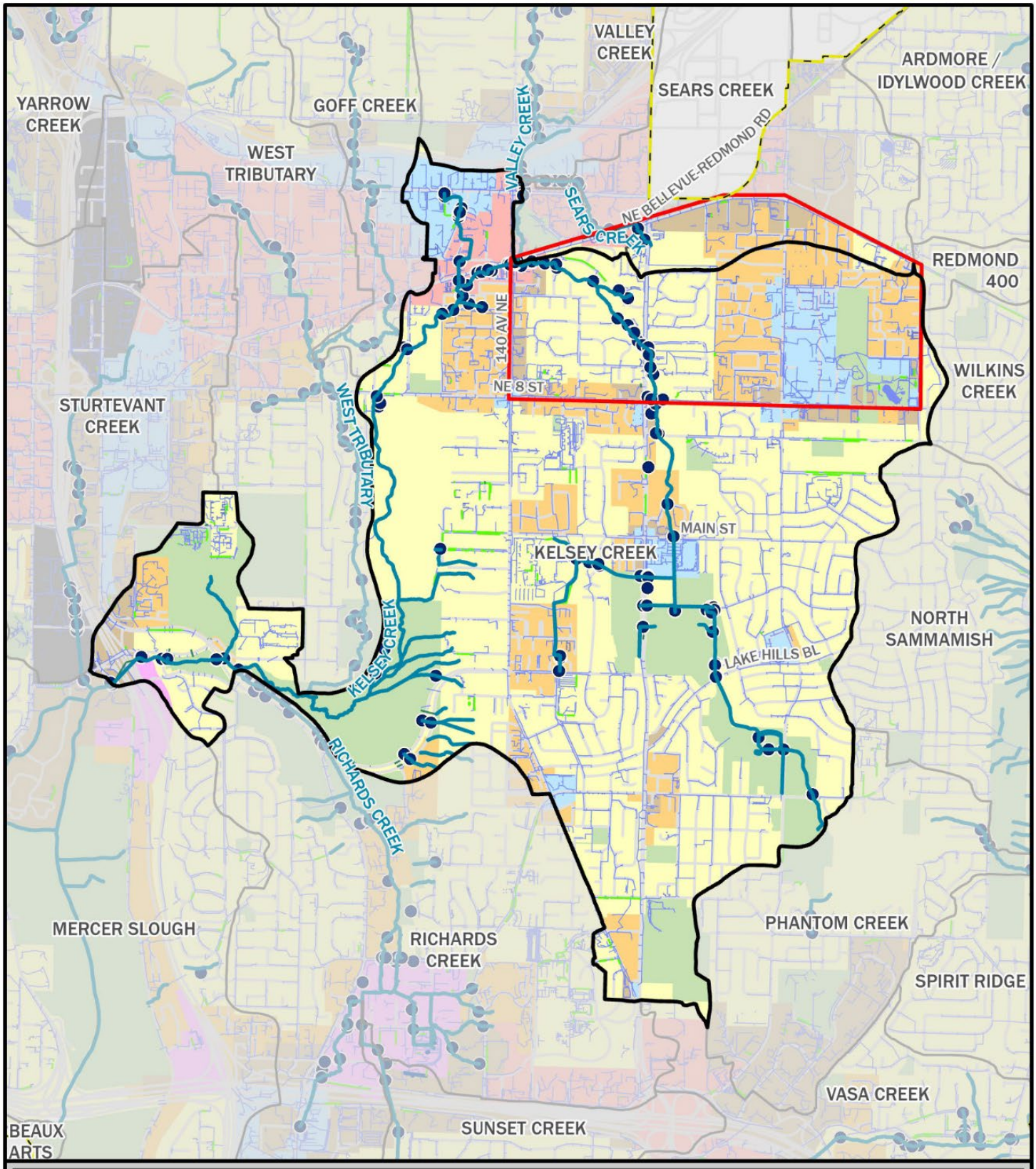
As documented in Herrera and Jacobs (2022a), the City cited the following considerations for selecting the Kelsey Creek Mainstem subbasin to fulfill its SMAP requirements:

- Kelsey Creek is identified as a Tier 2 priority for Chinook Salmon conservation in the Lake Washington watershed (WRIA 8 Salmon Recovery Council 2017).
- The Mainstem Kelsey Creek subbasin was assigned an "Improve" management strategy in the ongoing development of the City's WMP.
- The Kelsey Creek Mainstem Subbasin shows "moderate" potential for stormwater management to result in positive impacts on the health of the watershed and/or water bodies.
- Investments in stormwater management in the SMAP Catchment Area (described below) could provide benefit to immediate downstream reaches in the Kelsey Creek Mainstem Subbasin.
- Investments in stormwater management in the SMAP Catchment Area provides opportunities to address where overburdened communities have been identified (Herrera and Jacobs 2022a).

SMAP Catchment Area

The SMAP Guidance (Ecology 2019) recommends that permittees of the 2019–2024 Phase II Permit identify a catchment that is 400 to 600 acres in size within the prioritized subbasin to be the specific focus of the SMAP process. A 635-acre portion of the Kelsey Creek Mainstem Subbasin was therefore prioritized for this purpose, herein referred to as the SMAP Catchment Area (see Figure 2). Note that the SMAP Catchment Area also encompasses small portions of the Sears Creek and Valley Creek subbasins to capture contiguous high intensity development in the area that could also benefit from improved stormwater management identified through the SMAP process.



Legend

- SMAP Catchment Area
- Kelsey Creek Subbasin
- Subbasin Boundaries
- Bellevue City Limit
- Streets

Storm Drainage System (Bellevue Portal, 2020)

- Outfall to Stream
- Storm Open Drains
- Storm Pressure Mains
- Storm Culverts
- Storm Lateral Line
- Storm Gravity Mains
- Streams

Land Use

- Light Industrial
- Multi-family
- Office
- Retail
- Single-family
- Mixed-Use
- Other
- Bellevue Parks Property

Figure 2. Existing Conditions of Kelsey Creek Subbasin and SMAP Catchment Area, City of Bellevue.

N

0 1,000 2,000 4,000 Feet

Jacobs

HERRERA

King County Aerial (2019)

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STORMWATER MANAGEMENT ACTIONS

Per the 2019–2024 Phase II Permit's SMAP requirements (Ecology 2019), stormwater management actions can fall into one of three categories:

- Strategic stormwater retrofit projects: Projects designed and constructed, usually a new facility or expansion/upgrade of an existing facility, to address existing stormwater.
- Land management strategies: Programs, policies or studies targeting methods to improve or protect lands that are of high value or that can be converted to improve water quality or flow control.
- Stormwater management program enhancements: Actions integrated with existing 2019–2024 Phase II Permit programs that supplement permit requirements.

Consistent with the management strategy and limiting factors that were identified in the WMP for the Kelsey Creek Subbasin, the City identified a series of 'actions' in each of these categories for implementation in the SMAP Catchment Area to restore or enhance the Creek's ecological function. The specific actions that have been identified through this process are described in separate subsections below for each category.

Strategic Stormwater Retrofit Projects

Stormwater facility retrofit projects (RP) identified by the City include:

- RP-1: 164th Ave NE Bioretention Upgrade
- RP-2: Storm Drain Outfall Retrofit Feasibility Study
- RP-3: Area-Wide Detention Pond Conversion Feasibility Study
- RP-4: Commissioners Waterway Park Retrofit Feasibility Study
- RP-5: Kelsey Regional and Commissioners Waterway Detention Facilities Retrofit Feasibility Study

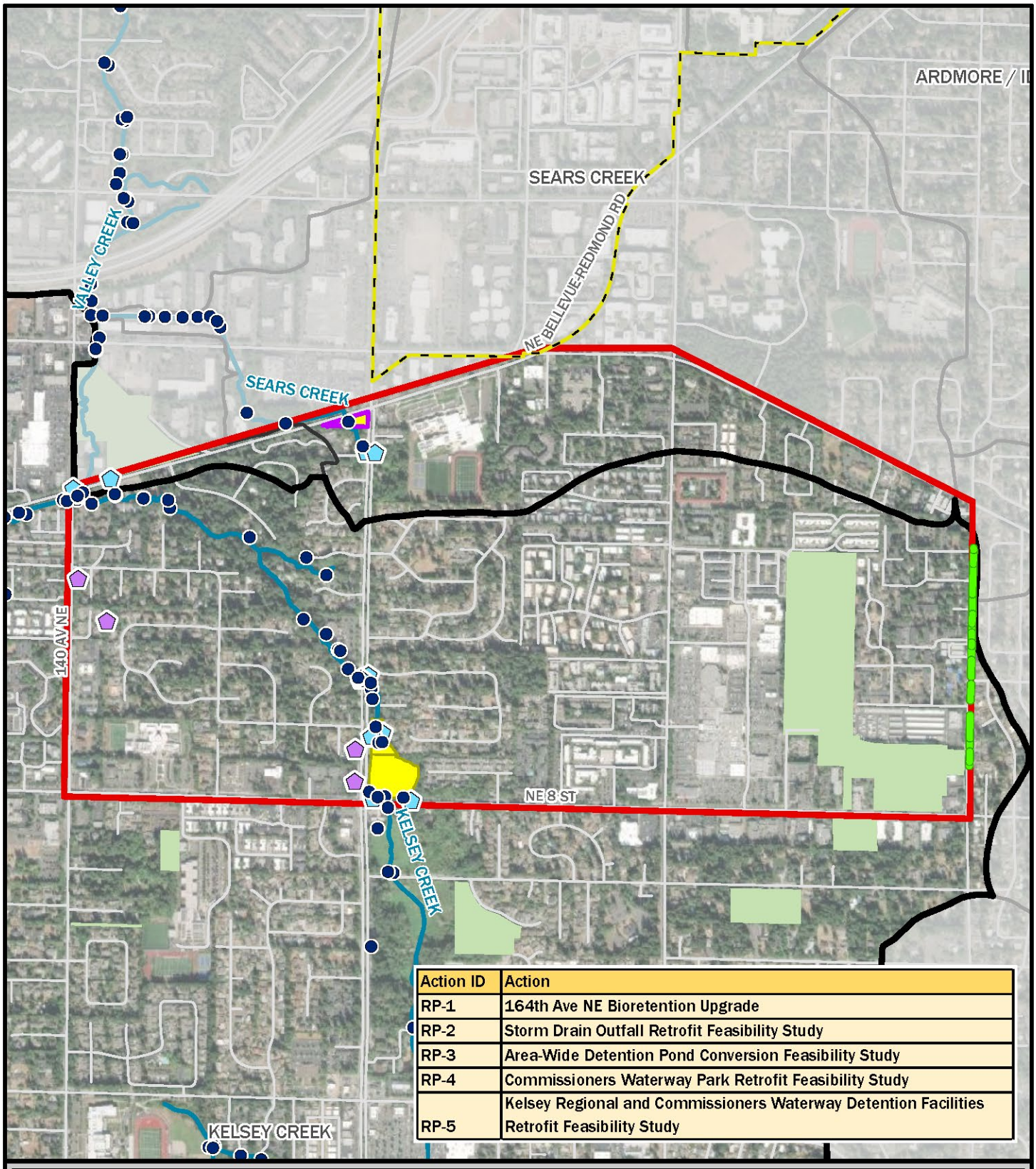
The projects and best management practice (BMP) types are summarized in Table 1. The locations of the projects are depicted in Figure 3.

Table 1. City of Bellevue SMAP Catchment Area Stormwater Retrofit Projects.			
Action ID	**Action**	**Description**	**BMP Type[a]**
RP–1	164th Avenue Northeast Bioretention Upgrade	Convert an existing traditional ditch to a bioretention swale along the east side of 164th Avenue Northeast, from Northeast 8th Street to Northup Way.	Bioretention
RP–2	Storm Drain Outfall Retrofit Feasibility Study	Conduct a retrofit feasibility study for several storm drainage outfalls along 140th Avenue Northeast, 148th Avenue Northeast, and Northeast 8th Street. Evaluate existing structures closest to outfalls for water quality treatment retrofit/upgrade opportunities, then potentially expand efforts to key storm drain inlets, as needed.[b]	Bioretention
RP–3	Area-Wide Detention Pond Conversion Feasibility Study	Conduct a retrofit feasibility study throughout the SMAP Catchment Area for converting traditional detention ponds into bioretention ponds/swales.[b]	Filterra, Modular Wetlands, Vortechs Filters, or Media Cartridges
RP–4	Commissioners Waterway Park Retrofit Feasibility Study	Conduct a retrofit feasibility study for construction of a stormwater treatment facility at the corner of Bel-Red Road and 148th Avenue Northeast (Commissioners Waterway Park).[b]	Bioretention
RP–5	Kelsey Regional and Commissioners Waterway Detention Facilities Retrofit Feasibility Study	Conduct a feasibility study to evaluate Kelsey Regional and Commissioners Waterway Detention Facilities for future water quality treatment options. Potentially retrofit the detention facility control structure and/or Crossroads outfall to provide water quality treatment.[b]	Filterra, Modular Wetlands, Vortechs Filters, or Media Cartridges

RP = Retrofit Project.

[a] These projects are in early design phase and the specific best management practice (BMP) that will be implemented may change.

[b] Pending favorable feasibility (cost/benefit) analysis, the project would be carried forward to design.



Action ID	Action
RP-1	164th Ave NE Bioretention Upgrade
RP-2	Storm Drain Outfall Retrofit Feasibility Study
RP-3	Area-Wide Detention Pond Conversion Feasibility Study
RP-4	Commissioners Waterway Park Retrofit Feasibility Study
RP-5	Kelsey Regional and Commissioners Waterway Detention Facilities Retrofit Feasibility Study

Legend

- Bellevue City Limit
- SMAP Catchment Area
- Kelsey Creek Subbasin
- Subbasin Boundaries
- Parks
- Streets
- Outfall to Stream
- Streams

Proposed Retrofit Projects

- RP-1
- RP-2
- RP-3
- RP-4
- RP-5

Figure 3. City of Bellevue's Proposed Retrofit Project Locations.

N

0 600 1,200 2,400 Feet

Jacobs HERRERA

King County Aerial (2019)

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Land Management Strategies

The City is identifying potential land management strategies for water quality improvement through the development of its WMP. Specific strategies that are currently under consideration include:

- An expanded tree planting and retention program.
- Policy updates to incentivize implementation of low impact development (LID) site planning and layout for new and redevelopment.
- A property acquisition program to protect/restore riparian areas or to implement projects to improve stream health.

Stormwater Program Enhancements

The City conducts a number of activities for compliance with the 2019–2024 Phase II Permit. These include activities associated with Illicit Discharge Detection and Elimination, Source Control, Operations and Maintenance, and Public Education and Outreach.

The City's existing procedures for implementing these activities were reviewed to consider what stormwater program enhancements (SP) would be beneficial for accelerating improvements in the SMAP Catchment Area. This section describes the identified actions within the SMAP Catchment Area that exceed 2019–2024 Phase II Permit required actions. Table 2 summarizes identified stormwater program enhancement actions and their descriptions.

Source Control Program for Existing Development

The City is required to implement a source control program, which includes the application of operational source control BMPs; a site inspection program; an inventory of pollutant-generating institutional, commercial, and industrial sites; and an enforcement policy. Twenty percent of the businesses/sites in the City's source control inventory are required to be inspected annually with provisions for responding to complaints and re-inspecting sites.

The City identified the following additional actions in the SMAP Catchment Area:

- SP-1: Conduct focused Source Control outreach efforts within the Crossroads Mall and surrounding area.

Operations and Maintenance (O&M)

The City is required to implement and document a program to regulate maintenance activities and to conduct maintenance activities to prevent or reduce stormwater impacts. The City must also implement practices, policies, and procedures to reduce stormwater impacts associated with runoff road maintenance activities under the functional control of the City. The City is required to inspect storm drain network catch basins owned or operated by the City every two years and clean and repair as needed

based on inspection. Documentation of practices, policies, and procedures to reduce stormwater impacts associated with lands owned or maintained by the City is also required, which includes (but is not limited to) street cleaning.

The City identified the following actions in the SMAP Catchment Area as potential stormwater management program enhancements:

- SP-2: Develop and implement an enhanced catch basin maintenance plan.
- SP-3: Develop a targeted street sweeping program.

Public Education and Outreach

The City is required to implement public education and outreach programs to build awareness, foster behavior change, and provide stewardship opportunities all related to water resource protection.

The City identified the following action in the SMAP Catchment Area as a potential stormwater management program enhancement:

- SP-4: Implement a Dumpster Outreach Program within the Crossroads Mall and surrounding area.

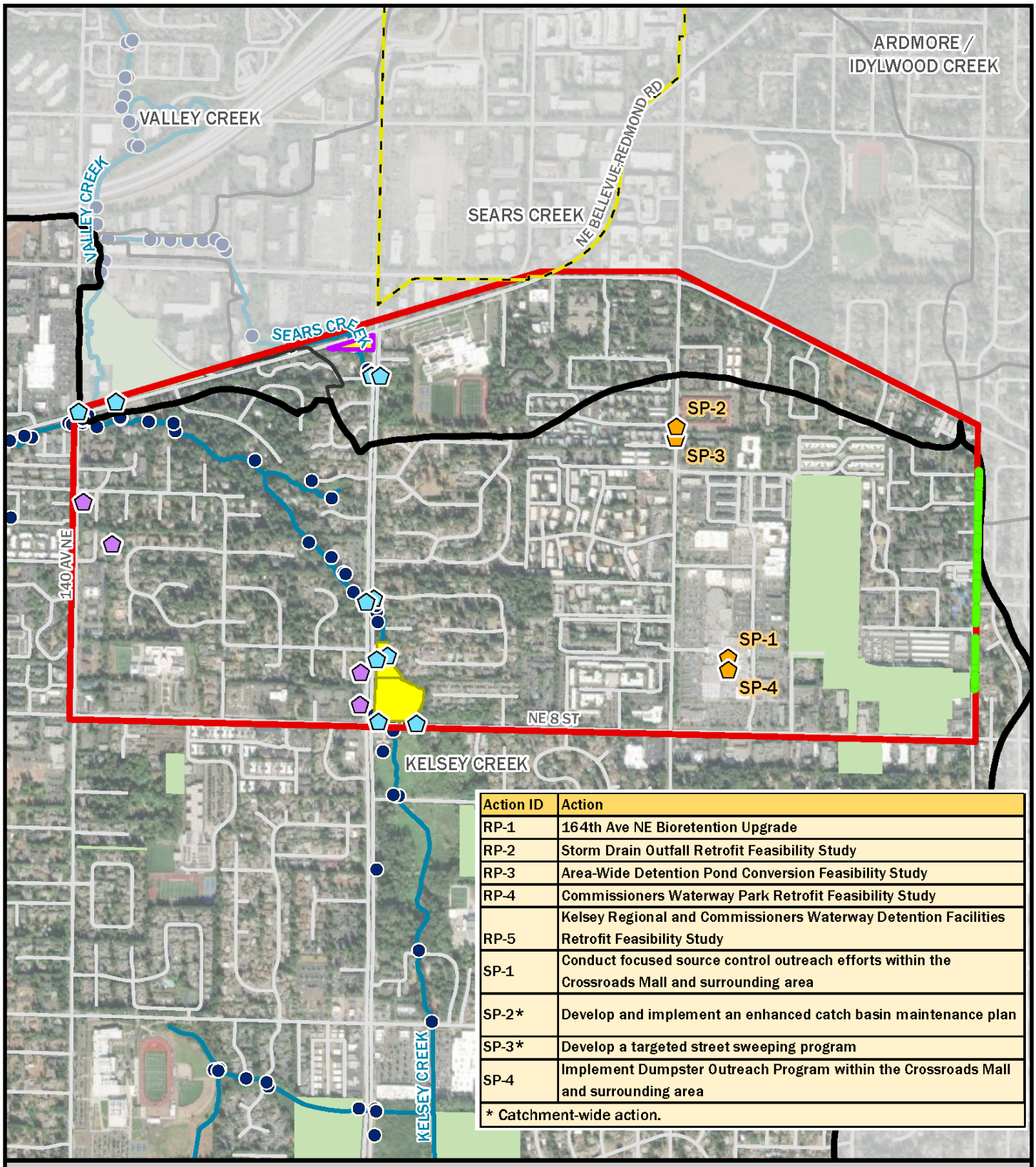
Table 2. City of Bellevue SMAP Catchment Area Stormwater Program Enhancements.

Action ID	Permit Section	Action	Description
SP–1	S.5.C.8–Source Control Program for Existing Development	Conduct focused source control outreach efforts within the Crossroads Mall and surrounding area	The City has a dedicated Senior Engineering Technician and Education and Outreach Specialist that would manage this effort. The Source Control efforts would combine efforts with the City's Fats, Oils and Grease, Cross Connection, and Private Drainage Inspection efforts for a combined inspection approach.
SP–2	S.5.C.7–Operations and Maintenance	Develop and implement an enhanced catch basin maintenance plan	The City currently inspects catch basins and manholes once every two years and cleans them as needed. Developing and implementing an annual catch basin inspection and maintenance schedule may include an increased inspection frequency and more detailed tracking of sediment buildup over time.
SP–3	S.5.C.7–Operations and Maintenance	Develop a targeted street sweeping program	The City's existing sweeping schedule for arterial streets is monthly and bike lanes is biweekly. Pending results of future and existing studies, an enhanced street sweeping program may consist of increased sweeping frequencies and/or a more targeted approach to sweeping around storm drain inlets.
SP–4	S.5.C.2–Public Education and Outreach	Implement a Dumpster Outreach Program within the Crossroads Mall and surrounding area	Implement a focused behavior change program via Dumpster Outreach efforts within the Crossroads Mall and surrounding area.

SP = Stormwater Management Program Enhancement

Stormwater Management Action Summary

Figure 4 provides a visual summary of the stormwater management actions identified in the SMAP Catchment Area.



Action ID	Action
RP-1	164th Ave NE Bioretention Upgrade
RP-2	Storm Drain Outfall Retrofit Feasibility Study
RP-3	Area-Wide Detention Pond Conversion Feasibility Study
RP-4	Commissioners Waterway Park Retrofit Feasibility Study
RP-5	Kelsey Regional and Commissioners Waterway Detention Facilities Retrofit Feasibility Study
SP-1	Conduct focused source control outreach efforts within the Crossroads Mall and surrounding area
SP-2*	Develop and implement an enhanced catch basin maintenance plan
SP-3*	Develop a targeted street sweeping program
SP-4	Implement Dumpster Outreach Program within the Crossroads Mall and surrounding area
* Catchment-wide action.	

Legend

- Bellevue City Limit
- SMAP Catchment Area
- Kelsey Creek Subbasin
- Subbasin Boundaries
- Parks
- Streams
- Streets
- Outfall to Stream
- Stormwater Program Enhancements

Proposed Retrofit Projects

- RP-1
- RP-2
- RP-3
- RP-4
- RP-5

Figure 4. City of Bellevue's Stormwater Management Actions

0 600 1,200 2,400 Feet

King County Aerial (2019)

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Changes to Long-Range Plans

The City develops Capital Investment Program (CIP) Plans that identify major public facility improvements for implementation over seven-year periods. City Council approved the budget for the 2021–2027 CIP Plan in December 2020. City Council approval of the budget for the draft 2023–2029 CIP Plan is pending. The SMAP will be incorporated into both the 2023–2029 CIP Plan and the WMP, respectively, by reference when they are finalized.

BUDGET SOURCE AND SCHEDULE

Budget sources for the stormwater management actions will primarily be derived from the Storm and Surface Water Utility and the associated CIP. Additional income sources may include water quality grants as well as the City's ongoing Capacity Grant from Ecology.

Project costs may be mitigated by grant funding programs; however, this document makes no assumptions related to possible benefits from these programs.

Some identified actions may be implemented annually while others may be implemented as a one-time project or program. The proposed schedule (see Table 3, Figure 5, and Figure 6) for SMAP implementation does not assume continuation of the projects or programs beyond their specified terms:

- "Short-term" projects or programs do not extend beyond the year 2030, and
- "Long-term" projects or programs do not extend beyond the year 2044.

These timelines are subject to change.

Table 3. City of Bellevue SMAP Catchment Area Stormwater Management Actions Schedule.

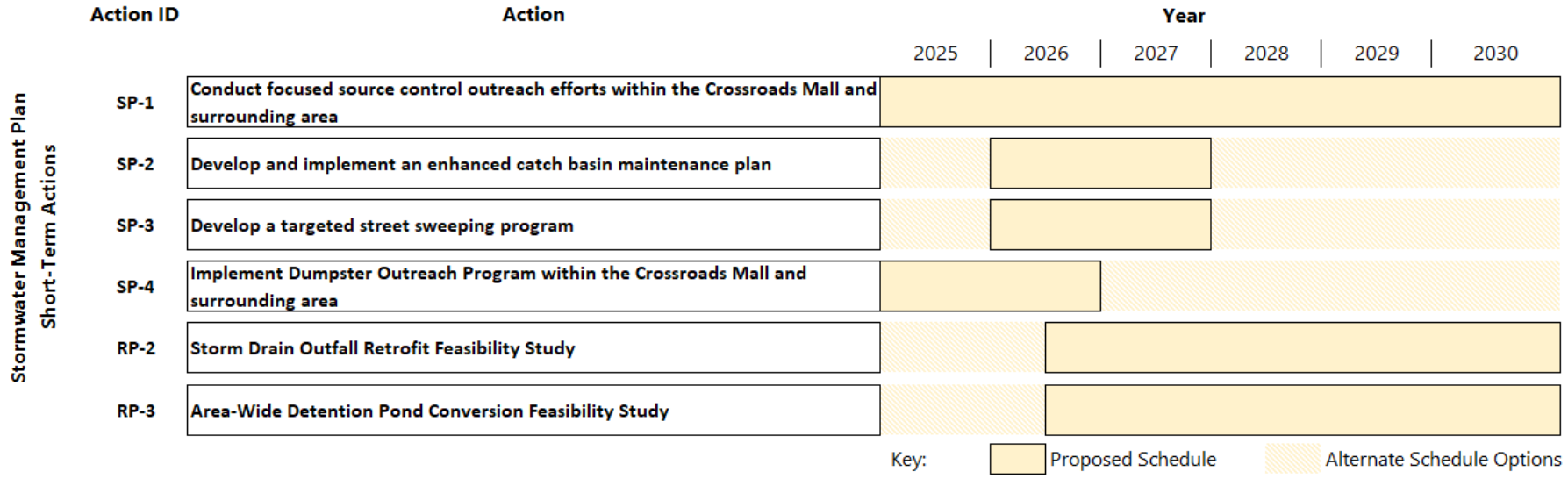
		Schedule	
Action ID	**Action**	**Short- or Long-Term[a]**	**Duration**
RP-1	164th Avenue Northeast Bioretention Upgrade	Long-Term	One-Time
RP-2	Storm Drain Outfall Retrofit Feasibility Study	Short-Term and Long-Term	One-Time
RP-3	Area-Wide Detention Pond Conversion Feasibility Study	Short-Term and Long-Term	One-Time
RP-4	Commissioners Waterway Park Retrofit Feasibility Study	Long-Term	One-Time
RP-5	Kelsey Regional and Commissioners Waterway Detention Facilities Retrofit Feasibility Study	Long-Term	One-Time
SP-1	Conduct focused source control outreach efforts within the Crossroads Mall and surrounding area	Short-Term	Annual
SP-2	Develop and implement an enhanced catch basin maintenance plan	Short-Term	One-Time
SP-3	Develop a targeted street sweeping program	Short-Term	One-Time
SP-4	Implement a Dumpster Outreach Program within the Crossroads Mall and surrounding area	Short-Term	One-Time

Short-term actions are not assumed to be extended into the long-term time period.

RP = Retrofit Project, SP = Stormwater Management Program Enhancement

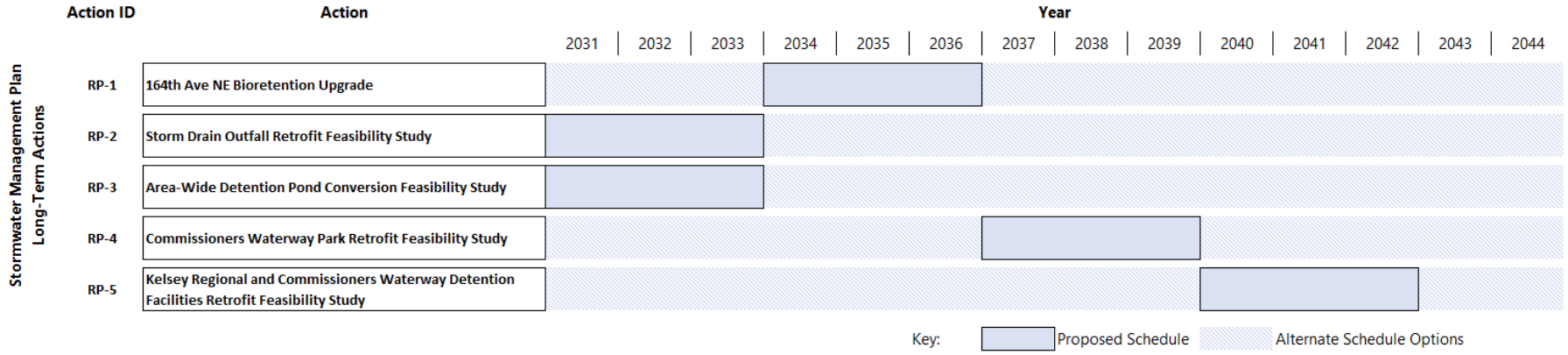
[a] Short-term = implementation between 2025 to 2030, Long-term = implementation between 2031 and 2044

Figure 5. Proposed Timeline for City of Bellevue SMAP Catchment Area Stormwater Management Short-Term Actions.



RP = Retrofit Project, SP = Stormwater Management Program Enhancement

Figure 6. Proposed Timeline for City of Bellevue SMAP Catchment Area Stormwater Management Long-Term Actions.



RP = Retrofit Project, SP = Stormwater Management Program Enhancement

FUTURE ASSESSMENT AND FEEDBACK

The City proposes to assess implementation of this SMAP by tracking project implementation and program effectiveness. The City will use the results of this assessment to adjust SMAP implementation over time.

Actions identified in this plan and then determined to be implemented, based upon future permit requirements, will be tracked for status of implementation. Tracking and review of actions will be performed periodically with the City's stormwater management staff. Challenges, modifications, or implementation timelines may be adjusted during the review period. The status and modifications will be documented.

City staff will continue to review water quality data collected through the City's Environmental Monitoring Program and other partners to determine if SMAP implementation is adequate over the long-term for meeting receiving water improvement goals.

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