# Receiving Water Prioritization Memorandum
# Stormwater Management Action Plan (SMAP)

Prepared for

LAKE FOREST PARK
Washington

February 2023

Prepared by

Parametrix

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# Stormwater Management Action Plan (SMAP)

*Prepared for*

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# INTRODUCTION

## Purpose

This report summarizes the Stormwater Management Action Plan (SMAP) prioritization methodology for the City of Lake Forest Park, WA (City). The SMAP basin prioritization is required by S5.C.1.d.ii of the Washington State Department of Ecology's (Ecology) National Pollutant Discharge Elimination System (NPDES) Western Washington Phase II Municipal Stormwater Permit (Ecology 2019a). Additional considerations in the development of the prioritization process were taken from the Stormwater Management Action Planning Guidance (SMAP Guide) (Ecology 2019b). The basin prioritization is the second phase of a three-step SMAP development process that started with the recently completed first phase Receiving Water Assessment (City of Lake Forest Park 2022). The prioritization is intended to create a finalist list of the City's receiving waters and drainage analysis catchments most likely to benefit from stormwater management planning and actions. In the third and final phase of the SMAP process, the City will identify stormwater management actions for one selected high-priority catchment area.

The SMAP Guide lays out expected findings and outcomes for the SMAP, which will describe the following:

- Strategic catchment area stormwater retrofits, including improvements to existing facilities and construction of new facilities
- Land management and development strategies to conserve and protect receiving waters
- Targeted and enhanced implementation of practices already part of the City's Stormwater Management Program (SWMP)

## Approach

Following Ecology's SMAP Guidance (2019b) and Washington State Department of Commerce's Building Cities in the Rain (2016) prioritization planning processes, the City's process will use applicable prioritization principles as described in the SMAP Guide and measures that are specific to the findings and circumstances in the City to address the objectives of the SMAP process. These principles and the recommended approach to apply each principle to a catchment is summarized in Table 1. This document will report the findings of the preliminary and secondary screenings. The final prioritization principles will be addressed in the third phase of the SMAP development process.

**Table 1. Prioritization Principles and Approaches**

| Principle | Approach |
|---|---|
| **Preliminary Screening** | |
| Give priority to catchments based on highest and lowest impairment levels | Score basins based on existing catchment area, imperviousness, land use, and stormwater treatment conditions |
| Give priority to catchments where the City has a larger percentage of control of the basin | Score basins that makeup at least 10% of the City's total area |
| Give priority to catchments where development threats are high due to amount of vacant and buildable land, intact undeveloped land, or estimated potential reduction in catchment future stormwater scores | Score basins based on future changes in buildable and vacant lands. Evaluate the greatest potential basin score reductions |
| Give priority to catchments that have high percentages of untreated roadway areas as potential basins to retrofit | Score basins based on acreage of untreated roads in the basin |
| Give priority to catchments that contain less than 30% impervious area and drain to a Benthic Index of Biotic Integrity (B-IBI) station as potential basins to preserve | Score basins by percent impervious and evaluate any B-IBI stations in basins under the impervious area criteria |
| **Secondary Screening** | |
| Give priority to catchments where the City has more prior investments in stormwater controls and stream projects or where future stormwater or stream projects are planned | Map and review the location of recent stormwater capital projects and the City's near-term stormwater capital projects plan |
| Give priority to catchments where future capital projects are planned (e.g., transportation, drainage, flood control) or redevelopment is occurring (for opportunistic project coordination) | Map and review the location of future capital projects and planned growth centers, transit nodes, or significant redevelopment projects |
| Give priority to catchments where there are high levels of public interest and support, concern over water quality impacts, existing planning and restoration efforts, and past and proposed community investments with public and stakeholder partners | List basins with community support for water quality improvements and with recent stormwater and restoration projects and other benefits identified by City officials |
| **Final Prioritization** | |
| Give priority to catchments where the receiving waters are more impaired or require greater protection based on existing available data | Review receiving water report and identify priority basin due to B-IBI scores and known monitoring or water quality characterization data |
| Give priority to catchments with overburdened communities, where human health impacts can be addressed and public spaces will enhance neighborhoods | Review and apply available data to select finalists from screened finalist basins |
| Give priority to catchments with lower levels of investment needed to meet water quality goals | Estimate required level of investment needed to meet desired protection or restoration goals |
| Give priority to catchments with greater action feasibility for stormwater management actions | Evaluate the level of resources needed to meet water quality goals using stormwater facility retrofits, customized SWMO actions, and land or development management actions |

The City's receiving water assessment data is presented at the City's SMAP website, available online at the following web address:

*https://storymaps.arcgis.com/stories/07bceb383a274f168751a9033d2aa52d*

# PRELIMINARY SCREENING

The first phase of the prioritization method involves the preliminary scoring and ranking of the City's catchment areas (Figure 1). Basins will be screened, and potential finalists will be selected from the scoring process. The geographic information system (GIS)/spreadsheet prioritization tool known as FutureShed is used for the first phase of the screening method. FutureShed ranks each basin, from most impairment due to impervious area (lowest score) to least impairment by impervious area (highest score). An overview of the FutureShed process is shown in Figure 2. Other information, as described in following sections, is then used to complete the secondary screened list for evaluation and selection of the finalists for SMAP development.

## Screening Process

The screening methodology is summarized as follows:

- The preliminary screening involves a mathematical approach to the catchments based on estimated existing and forecasted water quality and flow impacts from the catchments to the receiving waters. In the preliminary prioritization, the number of catchments is screened down three catchments, based on the catchment's potential to benefit from restorative or protective actions by the City. One category, catchments made up of less than 30 percent impervious area that drain to a B-IBI station with a fair or better score, will be evaluated for both restoration and protection. These basins are appropriate candidates for restoration as they have a low enough impervious area for stormwater management actions to produce measurable differences in water quality and the difference can be measured at the B-IBI station. These basins are also appropriate candidates for protection as they have high areas of forested land cover.
    - Catchments that would benefit the most from restorative actions will score the high in the following categories: worst score (most impaired) and largest catchments within the City. Additionally, catchments with higher amounts of untreated roadway areas will be assessed for restoration as untreated roads have the highest potential out of the evaluated impervious surface areas to impair water quality and flow control.
    - Catchments that would benefit most from protective actions will score high in the following categories: best score (least impacted), largest catchments within the City, and greatest score reduction due to future development.
- The secondary screening is a further review of the catchments by the City's Interdisciplinary Team (the cross-departmental City staff working on the SMAP development). The secondary screening considers additional qualitative factors (listed below) and accounts for public input from the community and partner stakeholders. After the secondary screening, two remaining basins will move forward to the final prioritization.
- Factors used in the secondary screening are as follows:
    - Catchments where the City has more prior investments in stormwater controls and stream projects or where future stormwater or stream projects are planned.
    - Catchments where future capital projects are planned (e.g., transportation, drainage, flood control) or redevelopment is occurring.
    - Catchments where more MS4 area exists.

  - Catchments with more stormwater management facilities.
  - Catchments with more partial or total fish passage barriers.
  - Catchments where there are high levels of public interest and support, concern over water quality impacts, existing planning and restoration efforts, and past and proposed community investments with public and stakeholder partners. Public input was given at the public involvement meeting on June 22, 2022. The results from the meeting are summarized in Appendix A.

- The final prioritization considers additional qualitative factors identified in the receiving water assessment to identify the single catchment with the most feasible actions identified that will be carried forward as the City's SMAP highest-priority catchment in the next phase. Examples of other factors to select the finalists include the following:
  - Catchments where the receiving waters are more impaired or require greater protection based on existing available data
  - Catchments with overburdened communities where human health impacts can be addressed and public spaces will enhance neighborhoods
  - Catchments with lower levels of investments needed to meet restoration or protection goals
  - Catchments with higher stormwater management action feasibility

City staff and internal project partners were engaged in many steps of the process. The review and selection team consist of the following:

- The City staff, including members from the Engineering Department, the City Administrator's Office, and the Public Works Department.
- Stakeholders, including the general public, as well as stakeholder groups such as StreamKeepers, the Stewardship Foundation, and the Tribes.
- A stormwater consultant team from Parametrix, Inc.

Additional input was received from the public in a public process meeting through the SMAP website and through an online story map with an interactive web map.

## Input Data

FutureShed uses the following inputs from the City's receiving water assessment:

- Drainage Catchment Areas: The receiving water assessment basins were sub-delineated into smaller catchment areas based on topography and the City drainage network. The catchment areas vary but are generally about 1 square mile.
- Land Cover: As discussed in the City's receiving water assessment, land cover type has a strong influence on stormwater runoff and downstream impacts to wildlife habitat and water quality. For FutureShed analysis, the City's land cover layers are classified into one of six different categories:
  1. Forest (contiguous stands of trees larger than 1 acre)
  2. Trees (all other mapped trees)
  3. Grass or landscape

4. Non-pollutant generating impervious surface (NPGIS)
5. Parking
6. Roads

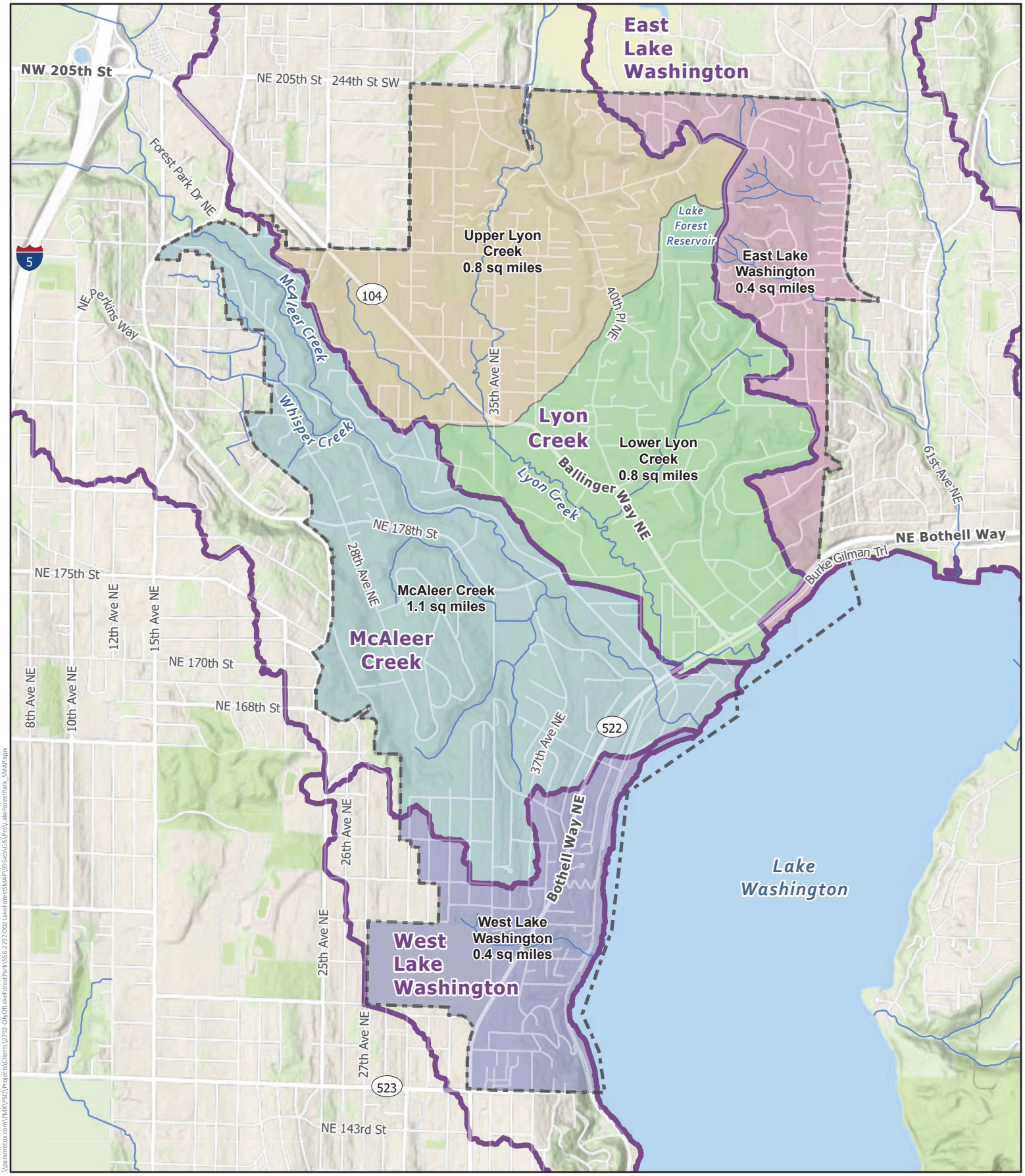
- Existing Stormwater Management: The stormwater management coverage for the City is based first on the installation dates of mapped facilities (see web map Detention Facility and Water Quality Facility layers). Additional existing stormwater management coverage is based on parcel development dates. The development dates corresponding to the mapped facilities and parcel permit dates are compared with historical dates of stormwater management thresholds adopted by the City to classify facilities as vintage or current. The SMAP prioritization is intended to serve as high-level planning, and for these purposes, the historical stormwater management milestones are based on the following:
  - Water Quality
    - No Treatment: Before the vintage threshold (before 1998)
    - Vintage Threshold: Year when basic treatment started to be required for most projects (1998–2010)
    - Current Threshold: Year when enhanced treatment was required for a broader range of projects (2010–Present)
  - Flow Control
    - No Treatment: Before the vintage threshold (before 1998)
    - Vintage Threshold: Year when facilities were sized to target existing conditions with a peak flow control standard (1998–2010)
    - Current Threshold: Year when facilities were sized to target pre-settlement (typically forested) conditions with a flow duration standard. (2010–present)

In addition to the inputs for evaluation of existing conditions, a consideration of future conditions is included in the objective review for prioritization:

- Buildable and Vacant Lands: This data is used to forecast areas of projected or targeted growth and estimate the stormwater management upgrades that would be triggered by future property development with the assumption that stormwater control design standards would be implemented where applicable. For use in FutureShed, the City's buildable lands and vacant lands GIS data is categorized as either vacant, underdeveloped, or built.
- Road Retrofit: This data is used to forecast the potential for increase in water quality and flow control scores if all roads within the City are brought to current treatment standards.
- Forest Preservation: This data is used to compare which basins in the City would benefit the most from active forest preservation steps taken by the City.

## Analysis

The preliminary prioritization is conducted using the GIS/spreadsheet-based FutureShed basin forecasting tool. FutureShed calculates, weights, and compares existing and future composite scores for flow and water quality pressures on receiving waters from each catchment. The baseline scoring process and future forecasting are described below.




Date: 6/30/2022
Sources: City of Lake Forest Park, King County, Port of Seattle, WA Ecology, WA DNR, USGS, ESRI
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes.

Stream
City Limits
Receiving Water Basins

Catchment Areas
- East Lake Washington
- Lower Lyon Creek
- McAleer Creek
- Upper Lyon Creek
- West Lake Washington

0 500 1,000 2,000 Feet

Figure 1 - Catchment Areas
Lake Forest Park SMAP
Receiving Water
Prioritization Methodology

Lake Forest Park, WA

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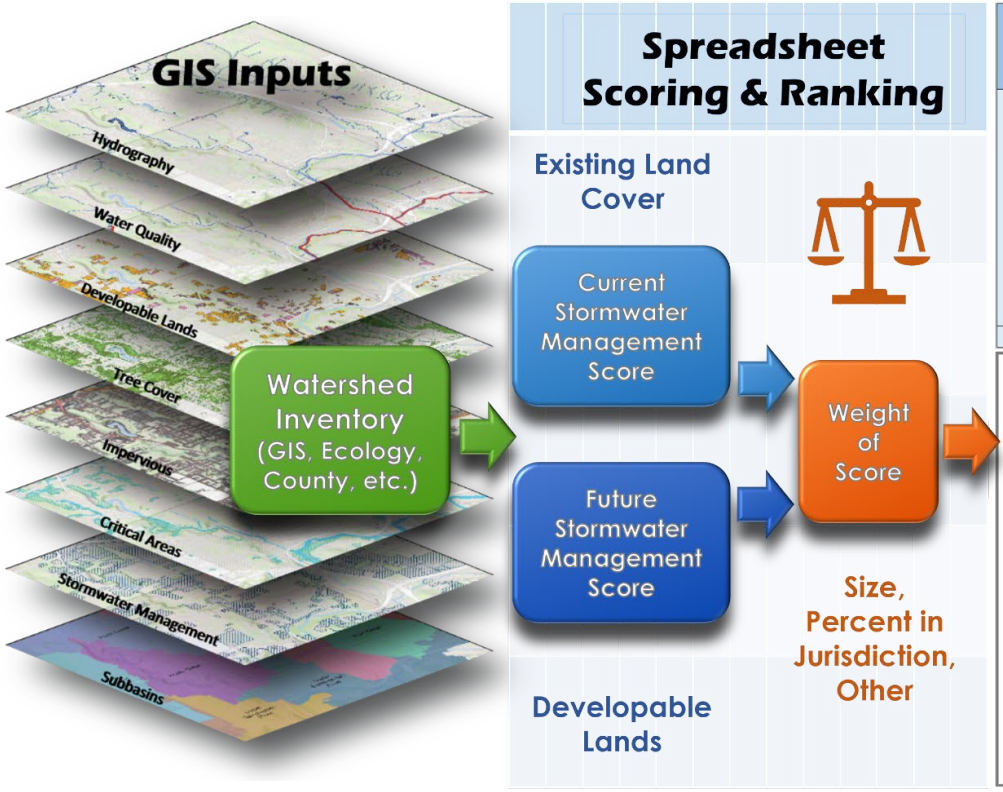



| Improvement Scenario: Full Build-Out and Forest Preservation | Potential Score | | | | | |
|---|---|---|---|---|---|---|
| | Flow Control | | | Water Quality | | |
| | Existing Score | Expected Score | Weight of Score | Existing Score | Expected Score | Weight of Score |
| Catchment 1 | 55 | 75 | 6% | 65 | 85 | 6% |
| Catchment 2 | 51 | 53 | 4% | 60 | 62 | 4% |
| Catchment 3 | 50 | 52 | 1% | 58 | 61 | 1% |
| Catchment 4 | 61 | 82 | 6% | 64 | 85 | 6% |
| Catchment 5 | 53 | 67 | 12% | 65 | 78 | 12% |
| Catchment 6 | 59 | 72 | 10% | 65 | 78 | 10% |
| Catchment 7 | 49 | 60 | 6% | 64 | 74 | 6% |
| Catchment 8 | 48 | 57 | 6% | 61 | 70 | 6% |
| Catchment 9 | 61 | 82 | 3% | 67 | 87 | 3% |
| Catchment 10 | 52 | 66 | 10% | 62 | 75 | 10% |
| Catchment 11 | 49 | 57 | 11% | 57 | 65 | 11% |
| **Composite Score** | 53 | 66 | 100% | 63 | 75 | 100% |

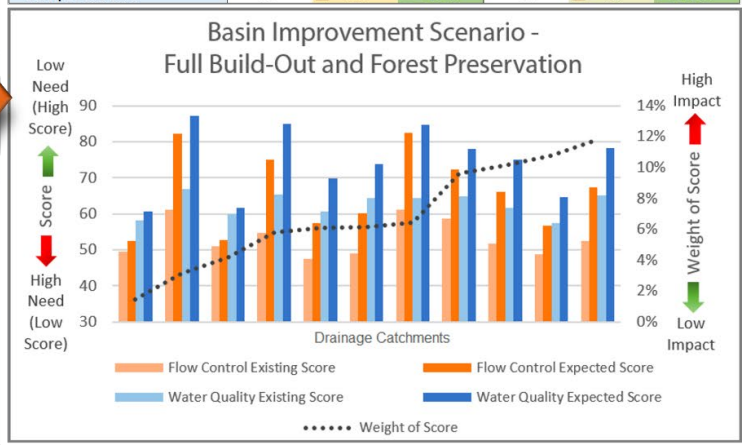



**Figure 2. FutureShed Process**

## Baseline Catchment Scoring

Using GIS data inputs in a spreadsheet, FutureShed quantifies and rates individual land cover types and their associated runoff characteristics, then calculates a comparative score to represent the effect of water quality treatment and flow control on that runoff. The composite score of managed runoff from each land cover type within a catchment area is then calculated to characterize the influence of that catchment's runoff on its respective receiving water. Through these comparative estimates, FutureShed allows the City to approximate hydrologic and pollutant loading impacts for current and future land use on a scale that is applicable to long-range watershed and land use planning.

The stormwater management scores are assigned as *no management (untreated or uncontrolled)*, *vintage*, and *current standards* based on land cover type as shown in Tables 2 and 3. Scores are based on professional judgment using industry-based knowledge of runoff characteristics and are not intended to reflect a definitive stormwater benefit. Instead, they are intended to show a comparative magnitude between different control types for runoff from different land covers.

**Table 2. FutureShed Water Quality Treatment Scores**

| | Water Quality Treatment | | |
|---|---|---|---|
| **Land Cover** | **Untreated** | **Vintage** | **Current** |
| 1.1 Forest | 100 | 100 | 100 |
| 1.2 Trees | 100 | 100 | 100 |
| 1.3 Grass or Landscape | 50 | 70 | 80 |
| 2.1 NPGIS | 40 | 60 | 70 |
| 2.2 Parking | 10 | 60 | 70 |
| 2.3 Roads | 0 | 30 | 70 |

Source: Scores are based on professional judgment and are not intended to reflect a definitive stormwater benefit; they are intended to show the magnitude between different control types for runoff from different land covers.
NPGIS = non-pollutant generating impervious surface

**Table 3. FutureShed Flow Control Scores**

| | Flow Control | | |
|---|---|---|---|
| **Land Cover** | **Uncontrolled** | **Vintage** | **Current** |
| 1.1 Forest | 100 | 100 | 100 |
| 1.2 Trees | 90 | 90 | 90 |
| 1.3 Grass or Landscape | 60 | 80 | 90 |
| 2.1 NPGIS | 0 | 70 | 80 |
| 2.2 Parking | 0 | 70 | 80 |
| 2.3 Roads | 0 | 70 | 80 |

Source: Scores are based on professional judgment and are not intended to reflect a definitive stormwater benefit; they are intended to show the magnitude between different control types for runoff from different land covers.
NPGIS = non-pollutant generating impervious surface

## Future Forecast

FutureShed is then used to forecast expected stormwater management coverage based on future development and redevelopment scenarios, with the assumption that stormwater control design standards would be implemented on development as required by City codes. The amount of future development is predicted based on the City's buildable lands data. For preliminary prioritization and comparison purposes, parcels identified as buildable are assigned a water quality score of 70 in the future and a flow control score of 80. Again, these scores are not definitive classifications of future

runoff but are used to compare the magnitudes of impact from different scenarios. The City will consider the following scenarios for comparison:

- "All Buildable" – Assumes all vacant and underutilized parcels would be developed in the future. This scenario updates parcels, but not adjacent roads. The "All Buildable" scenario may positively or negatively affect the FutureShed scores. If a vacant or underutilized parcel has mostly imperious land cover that contains no or vintage treatment, developing the parcel will add current water quality treatment and the FutureShed score will increase. If a vacant or underutilized a parcel with mostly forested land cover is developed with current water quality treatment, the FutureShed score will decrease as forested land cover provides better treatment and flow control than treated impervious land cover.
- "Road Retro" – Assumes all roads would be updated and retrofit to meet current flow-control and water quality standards. This scenario does not update parcels. The "Road Retro" either positively affects the FutureShed score if there are untreated and retrofittable roads within the catchment or is neutral if there are no retrofittable roads within the catchment.
- "Forest Preservation" – Assumes all forested areas will remain forested and will not be developed upon. The "Forest Preservation" Scenario typically positively affects the FutureShed score as an established forest provides better water quality and flow control than a new forest. This scenario can have no impact to the score if there is no forest land cover within the catchment.

The results of the FutureShed output for Lake Forest Park is shown in Figures 3 and 4. The catchment area map with the drainage analysis units are shown on Figure 1.

## Results of Catchment Scoring Screen

As described above, FutureShed is a screening tool used to assist in the preliminary screening process to select potential finalist catchment areas for consideration in the secondary screening process and the final prioritization. Three of the basins in the City will be included in this screened list.

The existing water quality and flow control FutureShed scores along with the percent impervious and percent built of each catchment in within the City are shown in Figure 3. These scores are ordered from worst composite score to best composite score.

The existing water quality and flow control FutureShed scores are also shown with the composite scores, catchment summary information, and future scenario values in Figure 4. The catchment summary includes information about the size of each basin relative to the City; total, treated, and untreated impervious percentages; and the acreage of untreated roads. The future scenario columns contain the change in score from the composite score when the future scenario is applied. For example, the West Lake Washington Basin increases from a composite score of 52 to 54 when all buildable lands are built out. Descriptions of the future scenarios can be found above in the "Future Forecast" section. As described, these values are not intended to reflect a definite stormwater benefit but are meant to provide a comparison of stormwater actions on the catchments.

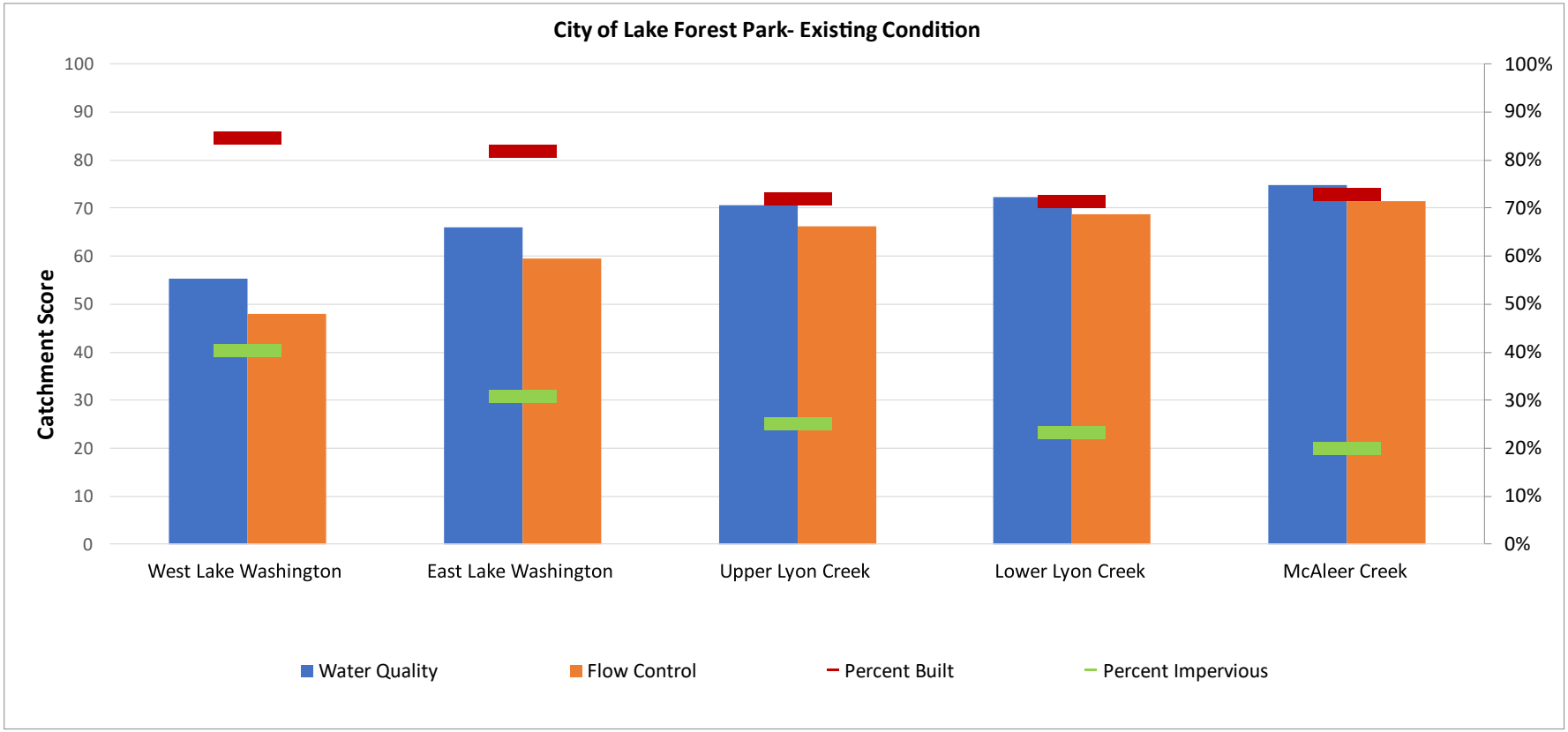



**Figure 3. FutureShed Output Graph**

| Expected Score | Need |
|---|---|
| 25 | High |
| 40 | Need |
| 55 | |
| 70 | |
| 85 | Low |
| 100 | Need |

| Impervious Area | Development |
|---|---|
| 100% | High |
| 80% | Density |
| 60% | |
| 40% | |
| 20% | Low |
| 0% | Density |

| | Catchment Summary | | | | | Current Score | | | Future Scenarios - Change from Existing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Basin | Percent of City | Treated Impervious | Untreated Impervious | Total Impervious | Untreated Roads (Acres) | Existing Treated Score: Water Quality | Existing Treated Score: Flow Control | Existing Treated Score: Composite | All Buildable | Road Retro | Forest Preserve |
| West Lake Washington | 12.2% | 6% | 34% | 40% | 26 | 55 | 48 | 52 | 2 | 9 | 4 |
| East Lake Washington | 11.2% | 4% | 27% | 31% | 43 | 66 | 60 | 63 | -1 | 8 | 11 |
| Upper Lyon Creek | 22.9% | 4% | 21% | 25% | 57 | 71 | 66 | 68 | -3 | 7 | 20 |
| Lower Lyon Creek | 22.5% | 1% | 22% | 23% | 46 | 72 | 69 | 71 | -1 | 6 | 20 |
| McAleer Creek | 31.2% | 1% | 19% | 20% | 34 | 75 | 71 | 73 | -3 | 6 | 22 |
| Total | 100% | 3% | 23% | 25% | 42 | 70 | 65 | 68 | -2 | 7 | 18 |

**Figure 4. FutureShed Output Table**

# SECONDARY SCREENING

The secondary screening will result in a short list of higher-priority catchments selected for the scoring and measurable characteristics described above. Additional catchments will be added that address other considerations, such as other stormwater projects (proposed and completed), growth areas and capital projects, community preferences, or the water quality considerations described in the previous section that the City wishes to consider separately from or in addition to the FutureShed scoring or other elements outlined in the SMAP Guide. The review of additional factors may add one or two catchment areas. The Interdisciplinary Team will evaluate City protection and restoration goals for each candidate catchment. A summary description of all factors considered are described below.

## Secondary Screening Factors

Additional considerations for the catchment finalists for selection may include the following:

Identified Capital Improvement Projects, Stormwater Management Facilities, and MS4 areas: Catchment areas where other proposed near-term or recently completed capital projects are located, more stormwater management facilities are located, or where more MS4 area exists will be considered for higher-priority ranking. The intent is to opportunistically add on to projects to take advantage of multi-benefit efficiencies and continue to advance the objectives of recently constructed projects that improve or enhance stormwater in a specific catchment or watershed. Additionally, more existing stormwater management facilities provides opportunities to retrofit existing facilities which is anticipated to be more cost effective than building new facilities.

Public Input: Public comments recorded through the online survey and web map comments will be considered during the prioritization, as applicable. Additional factors could include political support in an area; active public groups, such as “Friends of” organizations; long-term public cleanup or volunteer planting or vegetation management areas; and ongoing basin planning efforts with broad public support.

Fish Passage: Catchment areas with more partial or total fish passage barriers, city-owned barriers, and city owned barriers on the main stem of each receiving water will be considered for higher-priority ranking.

Other Department Planning: Citywide and project-specific plans from other City departments will be considered. For example, growth management planning, growth center or area redevelopment proposals, transit-oriented development, land conservation, or open space and parks planning can benefit from coordinated efforts. The City has identified any key or extensive special planning areas for sole consideration as a screened basin.

Identified Related Restoration or Improvement Project Areas: Catchment areas where regional rehabilitation efforts (such as salmon recovery plans, stream restoration, watershed action plans, and regional flooding solutions) are focused or where receiving waters have been identified as important will be considered for higher-priority ranking.

Other factors, such as public health and over-burdened communities, the water quality analysis, the level of investment required, and action feasibility, will be applied to the secondary screening finalists for selection of the proposed SMAP basins.

## Summary of Finalists

The results of the preliminary screening are summarized in Table 4. *Lowest Score* refers to the two basins with the worst water quality and flow control scores according to the FutureShed results. The *Untreated Roads* column shows the basins with the top two highest untreated road acreages in the City. *Highest Score* refers to the two basins with the best water quality and flow control scores according to the FutureShed results. *High Development Threat* includes the two basins with the highest negative change in score when the future development scenario was applied in FutureShed. The *<30% and Draining to a B-IBI Station* column accounts for any basin that has less than 30 percent impervious area and drains to a B-IBI station. The column labeled *>20 % of the City* includes any basins that take up at least 20 percent of the City to make sure the basins that have more influence in the City are weighted higher. The *Total* column is the sum of all categories.

**Table 4. Preliminary Screening Results**

| | Restoration | | Protection | | | Both | |
|---|---|---|---|---|---|---|---|
| Basin | Lowest Score (Most Impaired) | Untreated Roads | Highest Score (Least Impaired) | High Development Threat | <30% and Draining to a B-IBI Station | >20% of the City | Total |
| West Lake Washington | X | | | | | | 1 |
| East Lake Washington | X | | | | | | 1 |
| Upper Lyon Creek | | X | | X | X | X | 4 |
| Lower Lyon Creek | | X | X | | X | X | 4 |
| McAleer Creek | | | X | X | X | X | 4 |

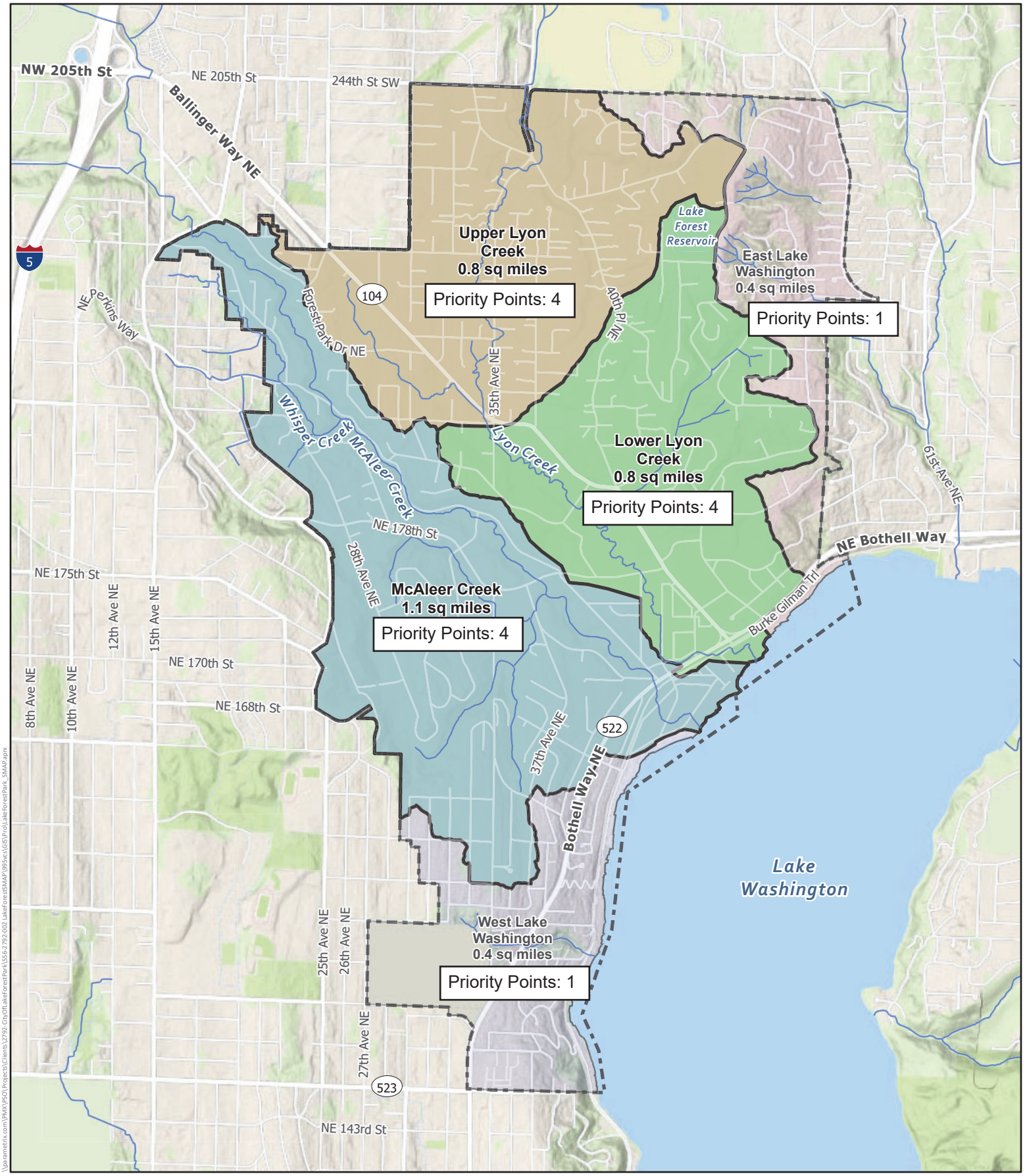
From the preliminary screening, the following basins will move on to the next screening: Upper Lyon Creek, Lower Lyon Creek, and McAleer Creek.

The results of the secondary screening are summarized in Table 5. The *Identified Related Restoration or Improvement Project Areas* category was not added as a column in Table 5 because no related project areas were identified within the remaining basins. The *CIP Projects* category refers to the two basins with the most proposed near-term or recently completed capital projects. *Stormwater Management Facilities* refers to the two basins with the most existing stormwater management facilities. *MS4 Area* refers to the two basins where more MS4 area exists. Most of the public input during the public meeting was focused on a desire to improve wildlife habitat and salmon health. In response to this input, fish barrier maps were examined to determine where habitat improvements in conjunction with barrier removal can be done, and higher priority was given to the two basins with more fish barriers in the *Fish Passage Barriers* column. It should also be noted that the City has developed an analysis on existing culverts but this analysis was only performed for the Lyon Creek basins. *Other Department Planning* category refers to the two basins where more Citywide project-specific plans from other City departments are located.

**Table 5. Secondary Screening Results**

| | Secondary Screening | | | | | |
|---|---|---|---|---|---|---|
| **Basin** | **CIP Projects** | **Stormwater Management Facilities** | **MS4 Areas** | **Fish Passage Barriers** | **Other Department Planning** | **Total** |
| **Upper Lyon Creek** | **X** | **X** | **X** | **X** | **X** | **5** |
| **Lower Lyon Creek** | **X** | | **X** | **X** | **X** | **4** |
| **McAleer Creek** | | **X** | | | | **1** |

From the secondary screening, Upper Lyon Creek and Lower Lyon Creek move to the final prioritization.

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Date: 6/30/2022
Sources: City of Lake Forest Park, King County, Port of Seattle, WA Ecology, WA DNR, USGS, ESRI
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes.

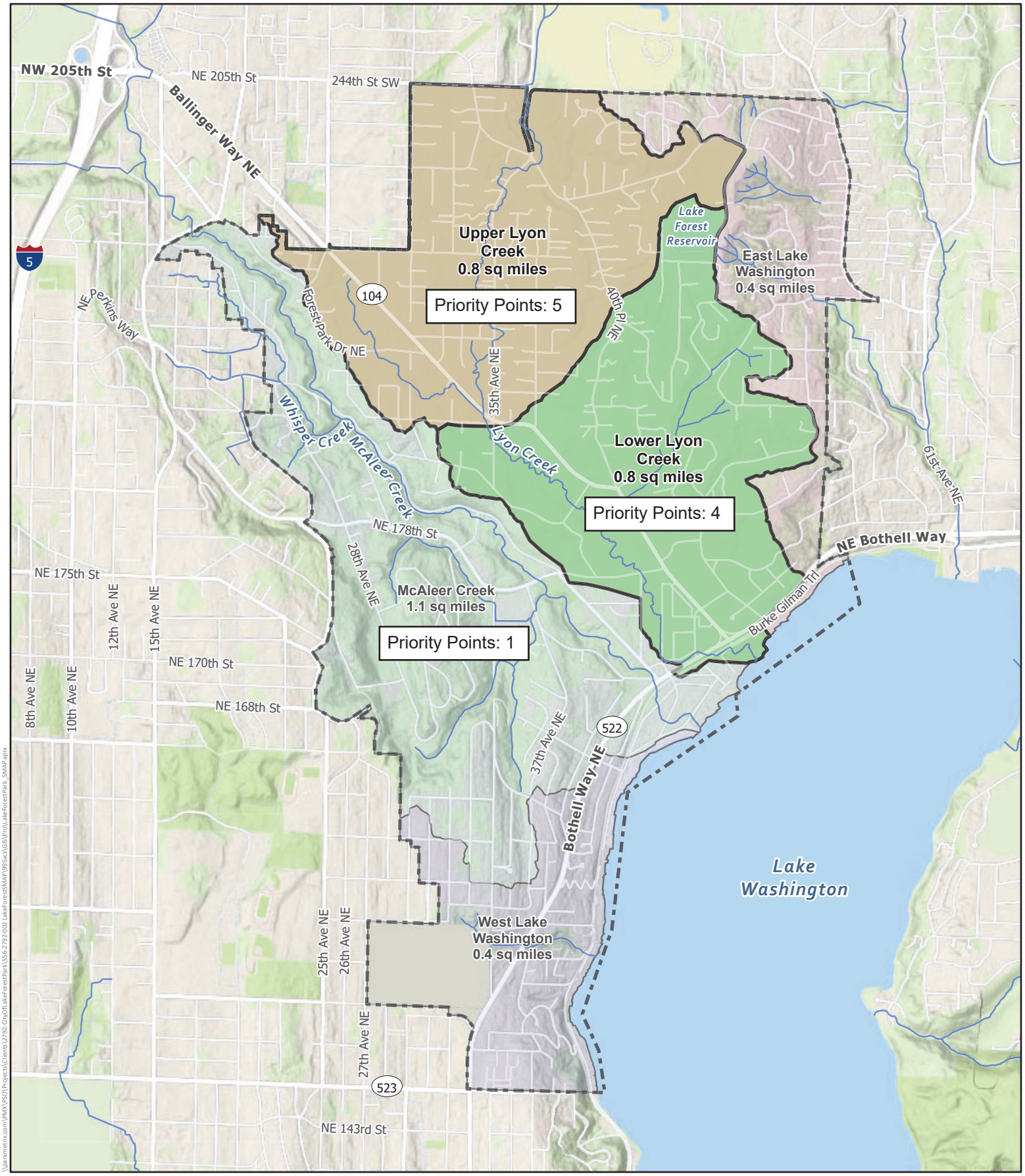
Stream
City Limits
Receiving Water Basins

Priority Catchment Areas
Lower Lyon Creek
McAleer Creek
Upper Lyon Creek

0 500 1,000 2,000 Feet

Figure 5 - Preliminary Screening Results
Lake Forest Park SMAP
Receiving Water
Prioritization Methodology

Lake Forest Park, WA

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Date: 6/30/2022
Sources: City of Lake Forest Park, King County, Port of Seattle, WA Ecology, WA DNR, USGS, ESRI
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes.

Stream
City Limits
Receiving Water Basins

Priority Catchment Areas
Lower Lyon Creek
Upper Lyon Creek

0 500 1,000 2,000 Feet

Figure 6 - Secondary Screening Results
Lake Forest Park SMAP
Receiving Water
Prioritization Methodology

Lake Forest Park, WA

# NEXT STEPS

In the third and final phase of the SMAP process, the City will consider the final screening factors (public health, receiving water analysis, level of investment, and action feasibility) and begin to assess and identify stormwater management actions for the three-remaining high-priority catchment areas.

## Public Health

Environmental and socioeconomic stressors may act cumulatively to affect health and the environment and contribute to persistent environmental health disparities (leading to overburdened communities), as discussed previously in the City's receiving water assessment. The environmental justice and opportunity scoring will be considered as part of the priority basin selection. Catchment areas with overburdened communities where water quality issues and human health impacts are intermingled and have potential for some improvement through stormwater management will be considered for higher-priority ranking.

## Receiving Water Analysis

In the prioritization process, water quality information gathered as part of the receiving water assessment were reviewed to consider the quality of water downstream from a catchment area. Information considered previously includes physiochemical and biological data as well as whether a receiving water has been listed on the 303(d) list for an impairment. Catchment areas' receiving water condition or impairment were considered as factors for higher-priority ranking. These are receiving waters expected to benefit as a result of stormwater management actions. In addition, receiving waters with B-IBI impairments will be considered for higher-priority ranking because the change in B-BIBI scores will be a good measure for seeing the outcomes of catchment area actions. B-IBI points will be used as the stream health indicators as the final priority basins have several B-IBI points within their receiving waters provided several sampling locations in the basin. Catchment areas with an impaired receiving water with current or future TMDL requirements were given lower-priority ranking or (as stated in the SMAP Guide) scientific justification. Modeling documentation for these catchment areas would need to be provided, showing how additional investments would go above and beyond the current/expected TMDL requirements.

The final prioritization process will evaluate the screened short list of catchment areas and associated available information on water quality conditions. These data will be considered as water quality indicators that would suggest catchments to be included as finalists in the action planning list.

## Level of Investment

The SMAP guidance suggests that one of the final criteria for selection of finalists for the action plan is to consider the "level of investment likely to meet water quality goals." In general, this would be primarily the capital project elements that would be constructed to retrofit untreated areas to bring them into alignment with existing stormwater management approaches that, in conjunction with the policies and land use planning, would lead to the desired protection and restoration goals. Ideally, if the approach is to select the basin based solely on the relative cost and benefit of the investments, a detailed approach to assess the "maximum extent practicable" (MEP) or "all known, available and reasonable methods of prevention, control and treatment" (AKART) would be needed. However, there are other factors to consider, such as public health and the condition of the receiving waters, that should be more influential,

provided the investment level is reasonably comparable between screened or prioritized catchments. Consequently, a method to provide a general weighting for comparing catchments is needed.

## Action Feasibility

During the final prioritization, the Interdisciplinary Team will evaluate the catchments based on the factors listed above in combinations decided upon by the team. The final selection of the priority catchment will be made based on implementability and feasibility to execute the proposed actions in the catchment. The City will evaluate the relative level of resources needed to meet protection and restoration goals using the three strategic SMAP elements: stormwater facility retrofits, customized SWMP actions, and land or development management actions. As previously discussed, the City will apply the action feasibility approach to the two or three selected catchments.

## Stormwater Management Actions

The stormwater management actions may consist of facility retrofits, land management and development strategies to benefit water quality, and targeted and enhanced implementation of practices already part of the City's permit compliance program. In identifying stormwater management actions, the City will consider the following questions (see SMAP Guide for additional background):

- What combination of additional stormwater management actions will most effectively reduce current and future loadings?
- Are substantial non-stormwater management actions needed to address the impairment?

Additional screening factors that will be considered during the stormwater management action selection will include the following:

- Physical Geography: Physical geography provides information about how water travels throughout a catchment area before reaching a receiving water. Soils play an important role in determining how much water can be infiltrated before runoff occurs. Runoff can amplify the effects of erosion and pick up sediment and pollutants. Untreated runoff will deposit any sediment or pollutants into receiving waters downstream. Physical geography within a catchment area can be restrictive regarding the types of stormwater management practices that can be implemented and may be important for consideration.
- Cultural Resources: The five step Cultural Resources Review process defined by Ecology (2021) will be considered, if applicable, during the stormwater management action selection phase. To do so, the City could complete a cultural resource review form and submit an inadvertent discovery plan (IDP) to Ecology for projects that would involve or could result in ground disturbance. Projects that involve ground disturbance, such as stormwater facility retrofits, are likely to be included in the SMAP. The City would coordinate with Ecology, tribes, Department of Archaeology and Historic Preservation, and other stakeholders to prioritize ground disturbing projects.

The City will then select from the two catchments to identify the catchment where the most feasible actions could be implemented, thus identifying the City's SMAP high-priority catchment and develop the action plan.

# REFERENCES

City of Lake Forest Park. 2022. Stormwater Management Action Plan (SMAP) Receiving Water Assessment. Prepared by Parametrix, Seattle, WA. March 2022.

Commerce (Washington State Department of Commerce). 2016. Building Cities in the Rain – Watershed Prioritization for Stormwater Retrofits. Publication Number 006. September 2016.

Ecology (Washington State Department of Ecology). 2019a. National Pollutant Discharge Elimination System Western Washington Phase II Municipal Stormwater Permit. Available at: https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Municipal-stormwater-general-permits/Western-Washington-Phase-II-Municipal-Stormwater.

Ecology. 2019b. Stormwater Management Action Planning Guidance. Publication. 19-10-010. Available at: https://apps.ecology.wa.gov/publications/documents/1910010.pdf.

Ecology (Washington State Department of Ecology). 2021. Cultural Resources Review Recipient Training. Available at: https://ecology.wa.gov/DOE/files/ef/ef810529-0f4e-4ac6-b358-7321fb4a6654.pdf.

# Appendix A

## Public Meeting Review

# APPENDIX A: PUBLIC MEETING REVIEW

Lake Forest Park Public Meeting

On Wednesday, June 22, 2022, the City of Lake Forest Park held a public Basin Prioritization Workshop for the City of Lake Forest Park community. City and consultant staff facilitated the workshop and included the following presenters: Andrew Silvia, the Senior Project Manager for the Stormwater Management Action Planning (SMAP) and the NPDES Program Coordinator for the City of Lake Forest Park; John Phillips, the SMAP consultant Project Manager and the Director of Integrated Watershed with Parametrix; and Suzy Godber, who is assisting with public outreach for SMAP and is a Marketing Coordinator with Parametrix.

The workshop educated attendees on the SMAP process, explaining the purpose of the assessment, describing the data collected in the completed first step, walking attendees through maps and data available to the community, and discussing what deliverables to expect in the coming year. Attendees engaged in a series of polling questions to provide input on their prioritized interests in healthy watersheds, which will be included in the prioritization process. The following are the polling questions with their respective number of votes in parenthesis.

1. *Clean watersheds contribute positively to our communities, including clean drinking water and outdoor recreation, all of which contribute to supporting economies, the environment, and high quality of life. What do you value most about clean watersheds? (Check all that apply)*
    a. Boating on the lake (0)
    b. Seeing salmon in the creek (4)
    c. Fishing (0)
    d. Swimming (2)
    e. Aesthetic of natural spaces (3)
    f. Wildlife habitat (4)
2. *Now that you understand the technical aspects of stormwater management, please select the number one thing you value most about clean watersheds. (Select only one)*
    a. Boating on the lake (0)
    b. Seeing salmon in the creek (2)
    c. Fishing (0)
    d. Swimming (0)
    e. Aesthetic of natural spaces (1)
    f. Wildlife habitat (4)
3. *Considering the benefits of clean water to your community, and understanding the technical aspects of watershed management, which surface-water-related issue is most pressing to you? (Select only one)*
    a. Neighborhood flooding (0)
    b. Wildlife impacts (6)
    c. Safety of recreational contact (1)