



WEST HYLEBOS STORMWATER MANAGEMENT ACTION PLAN (SMAP)

Prepared by, Environmental Services
City of Federal Way, Public Works Department

Stormwater Management Action Plan (SMAP)

The West Hylebos has been chosen as our basin to prioritize based on our prioritization method. SMAP prioritization process is in Appendix A. This SMAP will include a description of stormwater facility retrofits proposed for the area, their purpose, and location. Land management and development strategies identified for water quality management for the area. This will also involve augmentation stormwater management activities such as IDDE, source control, O&M inspections, and public education and outreach. All of this will be done along with a budget and implementation plan for short-term (within 6 years) and long-term (7 to 20 years) as required by the Western Washington NPDES Phase II permit issued by Ecology.

Background on West Hylebos Creek

The Hylebos Creek – West drainage basin is approximately 5,840 acres. It is the largest basin in the city, with approximately 91 percent of the basin inside the city limits. The Hylebos basin includes three subbasins:

- West Fork
- East Fork
- Lower Hylebos

Hylebos Creek drains directly to Commencement Bay in Puget Sound. The West Fork drains the central and southern portions of the city, with several smaller tributaries that converge at West Hylebos Wetland Park. Hylebos Creek provides spawning habitat for threatened fall-run Chinook salmon (*Oncorhynchus tshawytscha*) and has documented presence of threatened winter-run steelhead (*O. mykiss*) (WDFW 2021). The Hylebos basin has experienced significant development and urbanization. Hylebos Creek and the West Fork of Hylebos Creek are included on Ecology's 303(d) list for bacteria, dissolved oxygen, and temperature (Ecology 2021a).

The lower main stem and lower West and East Forks flow through Puyallup Tribal Lands. The Muckleshoot Tribe maintains fishing rights on Hylebos Creek, which was formerly home to substantial runs of coho (*O. kisutch*), chum (*O. keta*), and Chinook salmon, as well as cutthroat (*O. clarki*) and steelhead trout; these populations are now diminished. The Puyallup Tribe releases between 10,000 and 20,000 juvenile fall Chinook salmon into the West Fork on an annual basis (Schwartz 2016). The Salmon Habitat Protection and Restoration Strategy for water resource inventory area (WRIA) 10 does not prioritize Hylebos Creek as an area for salmon recovery due to the small populations it contains compared to populations in the main stem Puyallup, White, and Carbon Rivers.

Stormwater Facility Retrofits for the West Hylebos Basin

The permit requires the City present descriptions of the stormwater facility retrofits needed for the basin, including BMP types, and preferred locations. The retrofits listed here all derived from the 2021 Federal Way SWM Comprehensive Plan, Federal Way’s Capital Improvement Projects 2020-2026 Guide, and the 2023-2024 City Budget. A short-term project list and budget schedule, summarizing cost and purpose of each project can be found below as Table 4-1 and Table 4-2. Long-term projects are under development that shall follow development of the City’s 2024 Comprehensive Plan. Detailed project scope definitions are included in Appendix B.

Short-term:

Table 4-1 Capital Improvement Projects 2023-2028					
Project Name	Stormwater Facility Retrofit	Purpose	Total Cost	Unfunded Needs	Timeframe
South 356th Street Culvert Replacement	Yes	Replacement of existing twin 57"x38" arch culverts conveying West Hylebos Creek under S 356th St. The existing culverts will be removed and replaced with a concrete box culvert. Culvert is planned to be constructed in conjunction with S 356th St Roadway Improvements project.	\$1,400,000	\$521,000	LTD-2025
South 359th Street Culvert Replacement	Yes	Replace culvert and regrade the stream by removing the downstream weirs so the system is fish-passable and restore in-stream habitat.	\$890,000	\$890,000	2027-2028
Hidden Pond Feasibility	No	Feasibility study to assess options for utilizing the pond site.	\$60,000	\$60,000	2026
West Hylebos Basin Land Acquisition	No	Matching funds for King County Conservation Futures Grant property acquisition. The project will acquire high value riparian corridor properties and protect high value habitat and wildlife areas within the City.	\$5,180,000	-	LTD-2028
West Hylebos Education Center and Trail	No	Conversion of a portion of the Brook Lake Community center site into an education and outreach center. Retrofit of the existing building and parking lot into a trailhead for an expansion of the Hylebos Wetlands Park Trail to the south.	\$7,800,000	\$3,900,000	2027-2028
North Fork West Hylebos Watershed Trail	No	A nature trail system within Spring Valley along North Fork West Hylebos Creek. The trail will better connect the community with the natural environment, provide numerous education and outreach opportunities, and encourage environmental stewardship.	\$5,200,000	\$5,200,000	2025-2026
West Hylebos Watershed Trail (Spring Valley)	No	Construction of a nature trail system within the Spring Valley and Lower West Hylebos conservation areas to expand on the existing West Hylebos Wetland Park trails.	\$7,800,000	\$3,900,000	2027-2028
S 324th St and Pacific Hwy S Drainage Improvement	Yes	Drainage study, design, and construction of improvements to the storm system to address recurring street flooding during intense storms.	\$350,000	-	2023-2024
Upsize Pipes at SW Campus Dr, W of 9th Ave SW	Yes	Two storm drain laterals on SW Campus Drive are undersized and cause flooding in the roadway. Use pipe bursting techniques as road was recently overlaid.	\$30,000	-	2023
Small CIP Program	Yes	Includes miscellaneous small capital projects and major maintenance work to be completed by a combination of contracted services and city staff.	\$1,500,000	-	2023-2028
Pipe Repairs	Yes	Annual pipe rehabilitation program.	\$2,786,000	-	2023-2028
Catch Basin Repairs	Yes	Annual catch rehabilitation program.	\$675,000	-	2023-2028
Neighborhood Drainage Improvement	No	Annual program to respond to localized stormwater concerns (such as flooding) within neighborhoods (i.e. low impact development opportunities).	\$200,000	-	2023-2028
CCTV Inspection and Assessment	No	Annual Storm Drain CCTV inspection and assessment program.	\$1,200,000	-	2023-2028
Citywide Water Quality Monitoring	No	Annual water quality monitoring program.	\$600,000	-	2023-2028

Table 4-2 Short-term CIP Budget Schedule							
Cost in Thousands of Dollars (e.g. \$1 = \$1,000)							
Project Name	LTD thur 2022	2023	2024	2025	2026	2027	2028
South 356th Street Culvert Replacement	\$60	\$94	\$225	\$1,021 ^a			
South 359th St Culvert Repair						\$258	\$632
Hidden Pond Feasibility					\$60		
West Hylebos Basin Land Acquisition	\$2,280	\$1,150 ^b	\$150	\$1,150 ^b	\$150	\$150	\$150
West Hylebos Education Center and Trail						\$110	\$1,590
North Fork West Hylebos Watershed Trail		\$600 ^a	\$4,600 ^a				
West Hylebos Watershed Trail (Spring Valley)						\$220	\$7,580
S 324th St and Pacific Hwy S Drainage Improvement		\$75	\$275				
Upsize Pipes at SW Campus Dr, W of 9th Ave SW		\$30					
Small CIP Program	\$600	\$150	\$150	\$150	\$150	\$150	\$150
Pipe Repairs	\$884	\$317	\$317	\$317	\$317	\$317	\$317
Catch Basin Repairs	\$225	\$75	\$75	\$75	\$75	\$75	\$75
Neighborhood Drainage Improvement	\$50	\$25	\$25	\$25	\$25	\$25	\$25
CCTV Inspection and Assessment	\$600	\$100	\$100	\$100	\$100	\$100	\$100
Citywide Water Quality Monitoring		\$100	\$100	\$100	\$100	\$100	\$100

^a The City plans to apply for grant funding for half of this total cost.

^b The City plans to apply for grant funding for \$1M of this total cost.

Long-term:

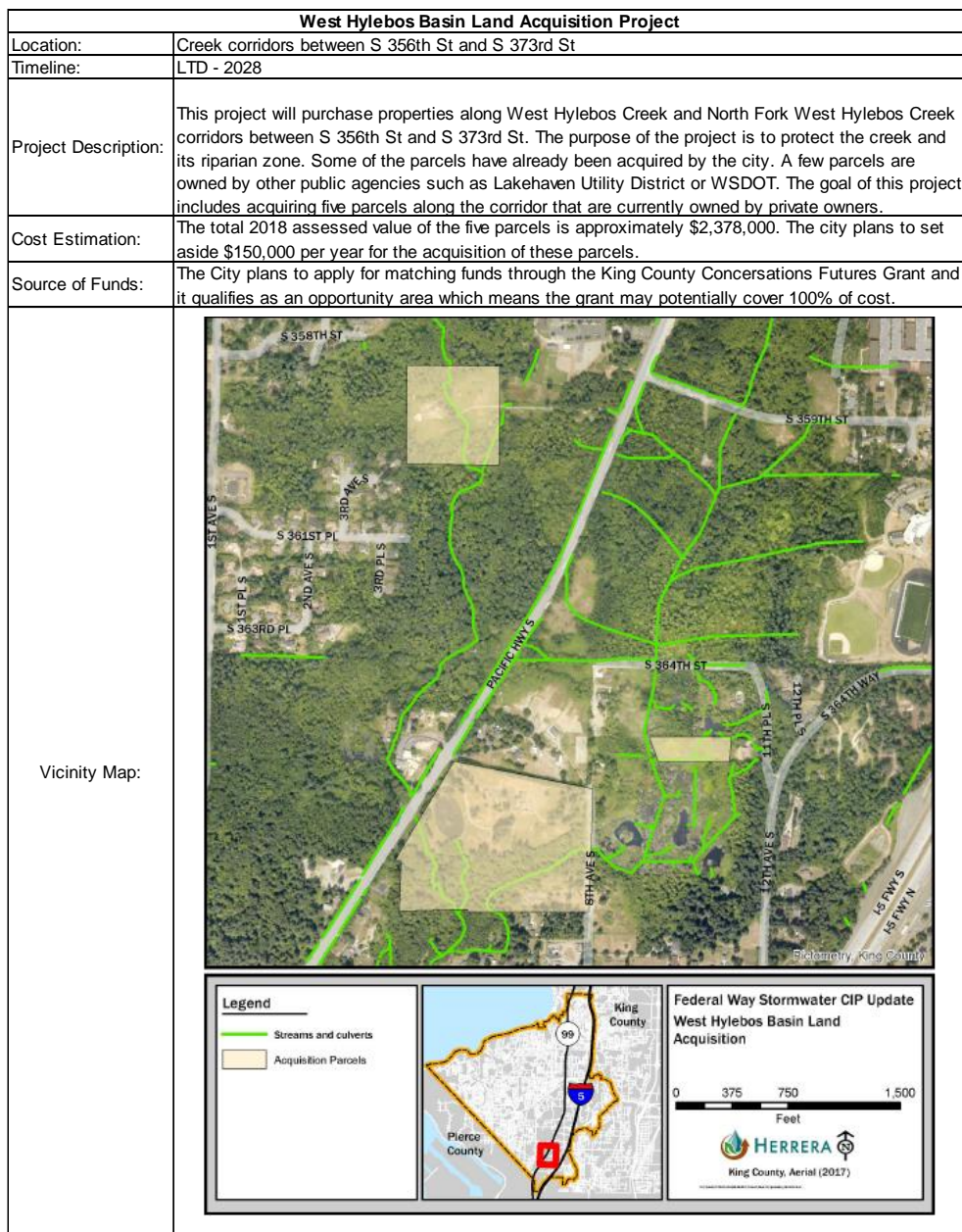
The City is currently working on updating the City's 2015 Comprehensive Plan for 2024. This will include a lot of long-range planning that will be taken into consideration when planning future stormwater retrofits. The 2024 Comprehensive plan will plan out the City for the next twenty years till 2044. More specific long-term retrofit project plans will be included once the 2024 Comprehensive Plan is more developed. The City plans out CIP projects for the next 6 years and that plan is updated every 2 to 3 years.

Land Management & Development Strategies

Ecology’s SMAP Guidance states “SMAP may include identification of lands to protect or conserve from impervious surface conversions or native vegetation removal, and the strategic means for providing the needed protection, which could be addressed via purchase or zoning or land use policy changes, to name a few options. SMAP may also include other zoning or land use policy changes deemed necessary to prevent the water body from maintaining its current designated uses.”

Short-term:

- We plan on acquiring 2 parcels in the West Hylebos for the purpose of conservation and restoring threatened and endangered species habitat as mentioned in Table 4-1. Currently, in the planning phase.



- The City current code, FWRC 11.45, charges surface waters rates by equivalent service units (ESU) and 1 ESU equals 3,200 square feet of impervious surfaces. Rate became effective January 1, 2021. Currently, the surface water rates increase annually until 2028. This financially incentivizes impervious development and creates a financial barrier for impervious development.

Long-term:

- If the acquisition of the creek corridors mentioned in the short-term goals is successful. The City will evaluate and plan best applicable use of the acquired land to improve West Hylebos basin.
- The City will reevaluate the surface water fee rate structure in 2028.

Augmentations to Stormwater Management Program

We are required to target, enhance, or customize our implementation of the stormwater management actions related to permit section within S5. This includes our IDDE program, source control inspections, O&M inspections or enhanced maintenance, and public education and outreach behavior change program. These are augmentation to our current stormwater management program that will take effect 2023.

Short-Term:

IDDE and Source Control

The following IDDE and Source Control Programs will be augmented to prioritize the West Hylebos starting in 2023.

- Dry Weather Outfall Inspections
 - Include outfalls within the basin annually
 - Increase frequency of outfall inspections; where all outfalls within the basin will be inspected every 2 years.
- Source Control
 - Prioritize sites and increase frequency of inspections for sites within basin to ensure majority of sites within the West Hylebos basin are inspected annually or biannually, dependent on staff time available.
 - Enhanced source control, in addition to traditional source control procedures this will also involve talking to property owner or business owner during site inspections, identifying sources of pollution, determine how sources of pollution are managed (usage, storage, and disposal), and provide BMPs specific to the business.

O&M Inspections and Maintenance

- Video Inspection
 - During video inspections for structure assessments we will opportunistically look out for illicit discharges or connections within the basin

- Business inspections
 - Inspectors will also look out for illicit discharges for sites in the basin.
- Catch Basin Inspections
 - During the maintenance inspections the inspectors will also check for illicit discharges for structures located within the basin.

Public Education and Outreach

- General Awareness
 - Focus on the West Hylebos when conducting outreach at public events such as movie night or farmers market.
- Stewardship Events
 - Plan more litter pick up events within the basin because most reports we get are regarding litter on public property. Out of 6,818 reports through our SeeClickFix system from Jan-Dec of 2021, 1,538 complaints were about garbage on streets/sidewalks.
 - Focus storm drain curb marking events within the basin.
 - Prioritize the West Hylebos in Stream Team stewardship activities.
- Behavioral Change Program
 - Prioritize sites within the basin when selecting business for our behavioral change program site visits conducted by ECOSS starting in 2023.

Long-term:

Short-term stormwater management program augmentations will be evaluated and adjusted as necessary.

Citywide Monitoring Program

The City will focus its monitoring program on all stretches of the West Hylebos that has a 303(d) impairment to begin process of correcting the impairments to improve water quality. First step, will be to verify that the impairments still exist. If impairments exist, then develop a plan to determine major source of impairment, correct the major source of impairment, and continue with monitoring to ensure that the impairment has been corrected if possible. This will be an ongoing program to assess the creek. Data will be used to track effectiveness of West Hylebos SMAP as applicable. This program launched January 2023. First couple years will be focused on establishing baseline measurements and characterizing impairments. The Federal Way City-Wide Monitoring QAPP is underdevelopment and will ensure we have quality data acceptable to Ecology.

Short Term:

- Establishing baseline data for local waterways.
- Identify and confirm current 303(d) impairments.

Long Term Goals:

- Identify major sources of impairments.

- Plan projects or efforts to reduce or prevent major sources contributing to impairments.

SMAP Update Schedule

The SMAP will be updated at least annually.

APPENDIX A

SMAP Assessment and Prioritization Process



Stormwater Management Action Planning

City of Federal Way

Stormwater Basin Assessment and Prioritization

Last Updated August 31, 2022

Public Works, Environmental Services

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1. INTRODUCTION

As a part of the 2019-2024 Western Washington Phase II Municipal Stormwater Permit issued by State of Washington's Department of Ecology (WADOE) in order to comply with the Clean Water Act National Pollutant Discharge Elimination System (NPDES); the City of Federal Way (City) is required to implement a Stormwater Management Action Plan (SMAP).

Development of the SMAP requires us to identify the watersheds within the City, rapidly assess the relative conditions of the receiving waters and the contributing areas with existing data, and to ultimately identify which basins to be included in the prioritization process.

Then develop and implement a prioritization method and process to determine which receiving waters will receive the most benefit from implementation of stormwater retrofits, tailored implementation of Stormwater Management Program (SWMP) actions, and other land/development management actions. The goal of the second component is to produce a document of the prioritized and ranked list of receiving waters.

Finally, the last step is to develop and implement a SMAP for the high priority catchment area based on previous work. The SMAP is required to include descriptions of stormwater facility retrofits needed for the area, including BMP types and preferred locations, land management/development strategies for water quality management, targeted, enhanced, or customized implementation of stormwater management actions, identification of needed changes to local long-range plans to address SMAP priorities, proposed implementation schedule and budget sources for long/short term actions, and a process and schedule to provide future assessment/feedback to improve the planning process and implementation procedures or projects. A full description on the permit requirement language can be found in the permit S5.C.1.d. This document was prepared following the Stormwater Management Action Planning Guidance document published by WADOE.

This section will describe the environment in Federal Way that affects surface water management, water bodies within the city limits, and the urban growth area (UGA) that receives surface water or stormwater from within the city limits.

Study Area Characteristics

Federal Way is bordered on the south and southwest by the city of Tacoma, on the south and east by unincorporated King County, on the east by Auburn, and to the north by Kent and Des Moines. The city limits encompass 23.7 square miles, and the current population is about 100,000.

Federal Way originated in the late 1800s as a logging settlement on Puget Sound. By the 1920s, Federal Highway 99 was complete, linking the community to the economic centers of Seattle and Tacoma. Rapid retail and residential growth created significant changes in the community during the 1970s and 1980s; and in February 1990, Federal Way incorporated to become the sixth largest city in the state. Today, the Federal Way community is residential and commercial with a population employed locally and in neighboring cities such as Sea Tac, Kent, Tacoma, Bellevue, and Seattle. Currently, Federal Way is the ninth largest city in Washington State, and the population is expected to exceed 107,000 by 2035. An estimated 22,485 people are employed within the city limits.

Land Use

Areas that do not infiltrate stormwater runoff (impervious area) in Federal Way are shown in Figure 1-1. City growth and changes in land use are guided by the City of Federal Way Comprehensive Plan, which was developed to comply with the requirements of the Growth Management Act (GMA). One of the goals of the GMA is to promote development inside the municipal Urban Growth Area (UGA) and to eliminate costly and environmentally damaging urban sprawl. This means that, within the city limits, the focus will be on redevelopment and infill; therefore, the City's Comprehensive Plan includes plans for a vibrant city center with mixed-use commercial and residential development in the downtown business area and access to public transportation.

As development and redevelopment projects occur, they will be required to comply with increasingly stringent standards for low impact development (LID) practices, onsite infiltration, stormwater treatment, and flow control. Therefore, it is expected that, over time, these projects will benefit surface water management, particularly in the context of redevelopment projects where sites without stormwater management are replaced by sites with modern stormwater management facilities.

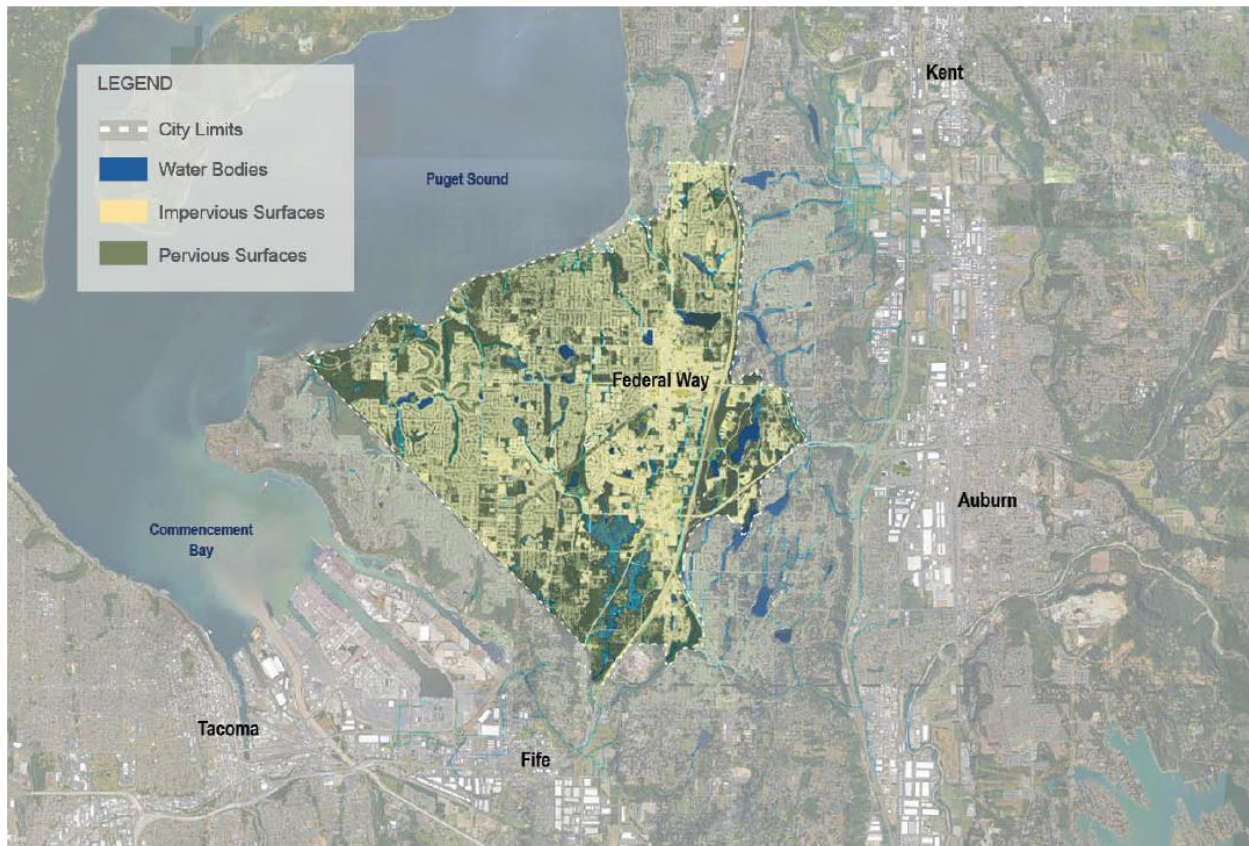


Figure 1-1. Vicinity Map of Federal Way with Delineated Impervious Areas.

Soil Characteristics

The primary soil type in Federal Way is Alderwood gravelly sandy loam, a moderately well drained soil overlaying a restrictive layer of glacial till at about 40 inches below the ground surface. While Alderwood soils are classified as hydrologic Soil Group B, indicating high infiltration capacity, the presence of the underlying till layer makes this soil less suitable for stormwater infiltration applications. Slopes are generally steeper in the northern half of the city bordering Puget Sound, with more wetland areas in the southern half of the city draining to Hylebos Creek.

Watershed Basins

Watershed basins in Federal Way are shown in Figure 1-2. Stormwater runoff within the city limits drains to 12 basins along the Puget Sound: Hylebos Creek – West, Hylebos Creek – East, Lower Green River – West, Mill Creek, Browns-Dash, Central Puget Poverty Bay, Joes Creek, Central Puget Redondo Creek, Dumas Bay, Lakota Creek, Lower North Puget Sound, and Central Puget Cold Creek (Figure 1-2). A brief description of each basin are provided following Figure 1-2.

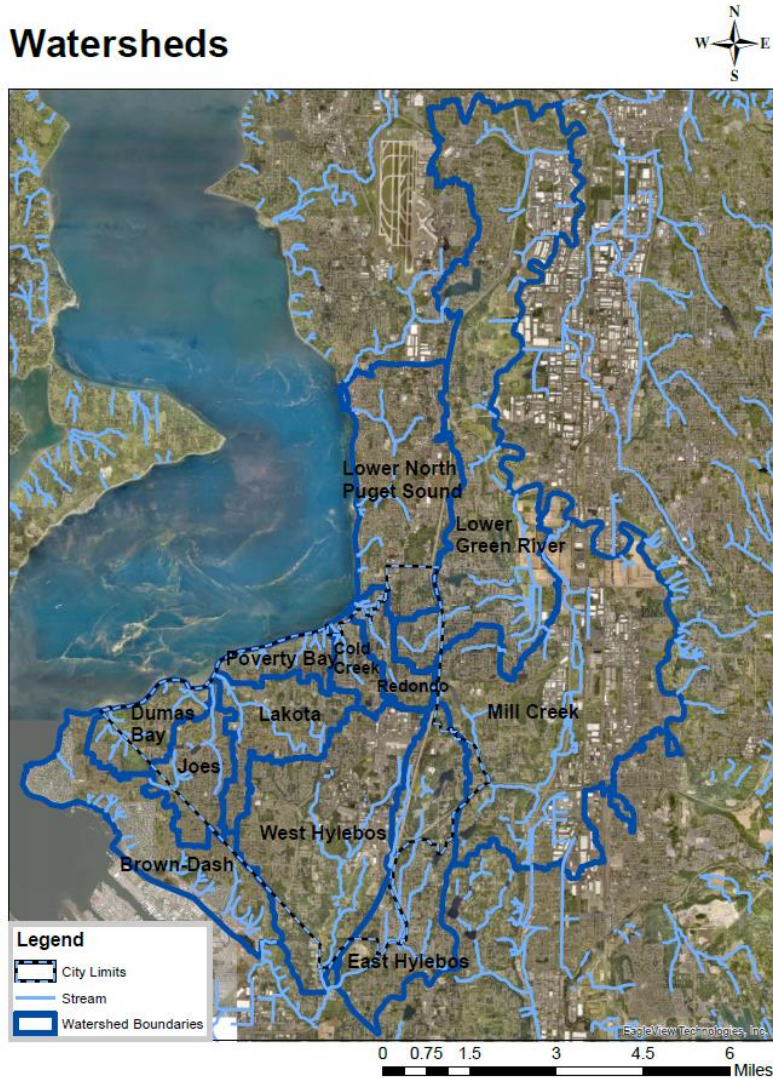


Figure 1-2. Watersheds in Federal Way

Water Quality Assessments

Ecology assesses the quality of all water bodies in the state to determine whether they are impaired by pollutants and require a water improvement project or Total Maximum Daily Load (TMDL). Ecology's 303(d) list contains the water bodies whose beneficial uses such as drinking, recreation, aquatic habitat, and industrial use are impaired by pollutants according to water quality assessments.

Habitat Resources

Where available, Benthic Index of Biotic Integrity (BIBI) data and data from the Puget Sound Watershed Characterization Project are also used to assess habitat. BIBI scores quantify the health of benthic macroinvertebrates in streams because they are good indicators of biological health. The BIBI scoring system can be used to compare and rank the health of different streams or the same stream across time, with higher scores indicating healthier streams.

Hylebos Creek – West

The Hylebos Creek – West drainage basin is approximately 5,840 acres. It is the largest basin in the city, with approximately 91 percent of the basin inside the city limits. The Hylebos basin includes three subbasins:

- West Fork
- East Fork
- Lower Hylebos

Hylebos Creek drains directly to Commencement Bay in Puget Sound. The West Fork drains the central and southern portions of the city, with several smaller tributaries that converge at West Hylebos Wetland Park. Hylebos Creek provides spawning habitat for threatened fall-run Chinook salmon (*Oncorhynchus tshawytscha*) and has documented presence of threatened winter-run steelhead (*O. mykiss*) (WDFW 2021). The Hylebos basin has experienced significant development and urbanization. Hylebos Creek and the West Fork of Hylebos Creek are included on Ecology's 303(d) list for bacteria, dissolved oxygen, and temperature (Ecology 2021a).

The lower main stem and lower West and East Forks flow through Puyallup Tribal Lands. The Muckleshoot Tribe maintains fishing rights on Hylebos Creek, which was formerly home to substantial runs of coho (*O. kisutch*), chum (*O. keta*), and Chinook salmon, as well as cutthroat (*O. clarki*) and steelhead trout; these populations are now diminished. The Puyallup Tribe releases between 10,000 and 20,000 juvenile fall Chinook salmon into the West Fork on an annual basis (Schwartz 2016). The Salmon Habitat Protection and Restoration Strategy for water resource inventory area (WRIA) 10 does not prioritize Hylebos Creek as an area for salmon recovery due to the small populations it contains compared to populations in the main stem Puyallup, White, and Carbon Rivers.

Hylebos Creek – East

The Hylebos Creek – East drainage basin area is approximately 3,900 acres, with approximately 45 percent of the basin inside the city limits. Refer to the Hylebos Creek – West description for general information regarding the larger Hylebos basin. The East Fork begins with several smaller tributaries in the eastern portion of the city near North Lake and Lake Killarney, which is located along the outer boundary of the city. The Hylebos Creek – East drainage contains threatened fall-run Chinook salmon spawning habitat and threatened winter-run steelhead documented presence (WDFW 2021).

North Lake is a 55-acre mesotrophic lake that is currently managed by a Lake Management District formed in 2010 to provide a funding mechanism for ongoing aquatic vegetation management, water quality monitoring, public education, and other lake improvement programs. North Lake has a maximum depth of 34 feet, has a boat ramp (no gas engines allowed), and is stocked with rainbow trout.

Lake Killarney is a 31-acre mesotrophic lake that has a maximum depth of 15 feet and a mean depth of 9 feet. The lake is located primarily outside the city limits in a public park, has a boat ramp (no gas engines allowed), and is stocked with bass and rainbow trout. As of 2017, monitoring data indicates that the lake has fairly clear water with moderate algal growth and fairly high nutrient concentrations (King County 2015b, as cited in Herrera, 2021) resulting in a 303(d) listing for total phosphorus. Algal blooms were reported in 2017 and 2018; however, data trends indicate decreasing nitrogen and phosphorus concentrations (King County 2017, 2018a, and Ecology 2019a, as cited in Herrera, 2021).

Joes Creek

The Joes Creek basin is approximately 1,530 acres; approximately 80 percent of the basin is located inside city limits. Upper Joes Creek is a highly modified urban stream that discharges into Dumas Bay in Puget Sound. The Joes Creek Basin also includes Lake Jeane and Lake Lorene (the Twin Lakes), both of which were recommended for lake restoration analysis in the Upper Joes Creek Watershed Nutrient Reduction Project due to phosphorus and related algae issues attributed to both surface water inputs and internal loading. Upper Joes Creek has nutrient concentrations similar to other King County streams and was found to be the primary source (84 percent) of the total phosphorus load to Lake Lorene (Herrera 2017, as cited by Herrera, 2021). This basin has presumed presence of federally listed threatened fall-run Chinook salmon and winter-run steelhead (WDFW 2021). BIBI scores are available for two locations on Joes Creek from 2014: 14.5 (very poor) and 10.3 (very poor). Joes Creek is on Ecology's 303(d) list for temperature (Ecology 2021a). There is also documented presence of Coho salmon at the mouth of Joes Creek (WDFW 2021). The Twin Lakes Golf Club and County Club is located in this basin and uses water from Lake Jeane as irrigation during the summer and pumps groundwater into the lake to replace the water used for irrigation.

Central Puget Redondo Creek

The Central Puget Redondo Creek Basin is approximately 800 acres, approximately 90 percent of which is located within the city limits. Redondo Creek drains from Steel Lake directly to Poverty Bay in Puget Sound and is severely incised. The Central Puget Redondo Creek Basin has presumed presence of federally listed fall-run Chinook salmon and winter-run steelhead, and documented presence of state-listed coastal cutthroat trout (WDFW 2021). Heavy erosion occurs during high flows; and poor water quality is present in the creek from nonpoint pollution, predominantly residential and commercial (FHWA et al. 2003, as cited by Herrera, 2021). Redondo Creek is on Ecology's 303(d) list for fecal coliform bacteria, specifically near the outlet to Puget Sound where it flows between Wooton Park and Redondo Beach Park (Ecology 2021a). Several fish passage barriers have been identified, including culvert crossings along Redondo Way South (which generally, follows the entire stream length), and the final crossing at Redondo Beach Drive South prior to discharge into Poverty Bay (WDFW 2021). This basin is located within the boundary of Poverty Bay Shellfish Protection District (PBSPD). SR 509 and SR 99 are major roads in this basin. Steel Lake is a 46-acre mesotrophic lake that is managed by a Lake Management District formed in 2003 to support vegetation management and water quality projects. Steel Lake has very good water quality. The lake has a maximum depth of 24 feet, a boat ramp (no gas engines allowed), and is stocked with rainbow trout.

Lakota Creek

The Lakota Creek basin is approximately 1,965 acres and is located entirely within the city limits. Lakota Creek drains from Lake Ponce De Leon and discharges directly to Puget Sound. The lower reaches of Lakota Creek have a presumed presence of federally listed fall-run Chinook salmon and winter-run steelhead. Approximately 27 percent of the drainage basin is impervious surface. Based on the City's GIS mapping, approximately 18 percent of the drainage basin is zoned for increased development density in potentially sensitive areas. The Lakota Wastewater Treatment Plant is located in this basin. BIBI scores are available for Lakota Creek from 2014: 42.8 (fair) and 16.4 (very poor). A significant portion of the stream runs along SR 509. Multiple fish passage barriers are present, including two dams and multiple culvert road crossings (WDFW 2021). Salmon are known to be present in Lakota Creek.

Central Puget Cold Creek

The Central Puget Cold Creek basin is approximately 680 acres, with over 90 percent located within the city limits. Approximately 15 percent of this basin is zoned for increasing development density in potential areas of ecological concern. Cold Creek drains from Easter Lake and flows directly to Puget Sound. The stream has been piped and channeled in several locations. Federally listed fall-run Chinook salmon and winter-run steelhead have a presumed presence, and state-listed coastal cutthroat trout are documented within this basin (WDFW 2021). Two fish passage barriers have been identified in the stream; the SR 509 crossing is designated as zero percent passable (WDFW 2021). This basin is also located within the boundary of PBSPD.

Mill Creek

The Mill Creek drainage basin (also called Hill Creek) is located in WRIA 9 (Duwamish-Green), predominantly in south King County. The larger drainage basin is roughly 15 square miles in size and includes portions of the cities of Kent, Auburn, Algona, and Federal Way. A small percentage (approximately 2 percent) of the basin is located inside the city limits and includes federally listed spawning fall-run Chinook salmon and winter-run steelhead, and documented presence of federally listed bull trout and state-listed coastal cutthroat trout (WDFW 2021). According to King County, most of the basin (76 percent) is developed (King County 2016, as cited in Herrera, 2021). Monitoring indicates that water quality (e.g., turbidity, total suspended solids [TSS], fecal coliform bacteria, nutrients) has generally improved in Mill Creek since 1979; however, Mill Creek has low dissolved oxygen, high ortho-phosphorus, and high fecal coliform bacteria counts relative to the Green-Duwamish Watershed (King County 2016 as cited in Herrera, 2021).

Browns-Dash

The Browns-Dash drainage basin is approximately 3,400 acres, with less than 2 percent of the basin located within city limits. Most of the basin is in Pierce County (unincorporated UGA of the city of Tacoma). There are no named streams and only minor unnamed streams mapped within the basin, which drains directly to Commencement Bay in Puget Sound and includes presumed presence of federally listed fall-run Chinook salmon and winter-run steelhead (WDFW 2021). The Browns-Dash basin borders the Port of Tacoma and includes the North Shore Golf Course. There are several nearshore 303(d) listings close to this basin, including polychlorinated biphenyls (PCBs) in Dalco Passage and East Passage, and dissolved oxygen, phthalates, and PCBs in Commencement Bay (Outer) (Ecology 2021a).

Central Puget Poverty Bay

The Central Puget Poverty Bay drainage basin is approximately 820 acres and is located almost entirely (99 percent) within the city limits. The Central Puget Poverty Bay drainage basin is currently 19 percent impervious. There are no named streams in this basin, but several mapped unnamed streams drain directly to Puget Sound. Although there is no documented use by federally listed or state-listed species (WDFW 2021), and there are no fish passage barriers associated with these unnamed streams (WDFW 2021), there is documented residential fish use by these unnamed streams (WDFW 2021). Portions of the shoreline are identified by the City for bluff restoration and bluff conservation. This basin is also located within the boundary of Poverty Bay Shellfish Protection District (PBSPD) (King County 2018b, as cited by Herrera, 2021).

Lower Green River – West

The Lower Green River – West drainage basin area is approximately 9,300 acres, with a small percentage (approximately 5 percent) of the basin inside the city limits. Bingaman Creek is located in this drainage basin; the stream begins at Laurelwood Park, is crossed by Interstate 5 (I-5) (total fish passage blockage), and drains away from the city through Bingaman Pond Natural Area. There is some discrepancy in naming between Bingaman and Bingamon drainages, which appear to converge with drainage from Star Lake and form an eventual tributary to the Green River. The Green River is spawning habitat for Endangered Species Act (ESA) threatened fall-run Chinook salmon and threatened winter-run steelhead and has documented presence of threatened bull trout (*Salvelinus confluentus*) and state-listed coastal cutthroat trout, which may extend to Bingaman Creek (WDFW 2021). The Green River (which does not flow within city limits) has a TMDL for temperature.

Lower North Puget Sound

The Lower North Puget Sound basin is approximately 4,270 acres, with approximately 11 percent of the basin within the city limits. There are no named streams in this basin mapped inside the city limits. Mapped streams in this basin that are outside the city limits include Barnes Creek, Massey Creek, and McSorley Creek; all three streams are on Ecology’s 303(d) list for fecal coliform bacteria and dissolved oxygen (Ecology 2021a). Although there are no federally listed species within this basin, the streams include documented presence of state-listed coastal cutthroat trout (WDFW 2021). This basin is located within the boundary of PBSPD. The portion of the basin within the city is ranked in the “Highest Restoration” category (high importance and high degradation) by the Puget Sound Characterization Project. SR 99 passes through this drainage basin.

Dumas Bay

The Dumas Bay basin is approximately 1,284 acres, approximately 67 percent of which is located within the city limits. Approximately 16 percent of the drainage basin is impervious surface, and SR 509 bisects the drainage basin. A significant portion of the drainage basin within the city limits is occupied by Dash Point State Park. The Twin Lakes Golf Course is also located in the basin. No named streams are mapped in this drainage basin; however, several partial unnamed streams are present, which discharge into Dumas Bay and have mapped fish presence (WDFW 2021). This basin has a presumed presence of federally listed fall-run Chinook salmon and winter-run steelhead (WDFW 2021). A portion of this basin is ranked in the “Highest Restoration” category (high importance and high degradation) by the Puget Sound Characterization Project (Ecology 2020).

2. RECEIVING WATER CONDITIONS ASSESSMENT

The initial assessment for the SMAP is broken into 4 steps. First step is to delineate basins and identify receiving waters. Additionally, we must determine the total contributing watershed area for each receiving water until it flows into a flow control exempt water body such as the Puget Sound or Green River, the percentage of area of each basin within Federal Way's jurisdiction, and for direct MS4 discharges into the Puget Sound if receiving shoreline is an area of net deposition. For this step of the assessment we mainly relied Federal Way's GIS data and National Hydrography Dataset (NHD), City of Federal Way's SWM Comprehensive Plan and WA DOE Coastal Atlas. The basins are delineated in Figure 1-2. Table 2-1 displays a small portion of assessment information collected.

The second step of the assessment requires us to assess receiving water conditions with existing information and data. For this step of the assessment multiple sources were used to collect data. This includes, but not limited development pressure, designated uses, impairments, and overburdened communities. See Appendix A for the completed assessment table and all of the elements considered in the assessment phase.

The third step of the assessment requires us to assess our Stormwater Management Influence for each receiving water. This information helped us determine how much of a benefit a specific receiving water would receive from a SMAP. The two general considerations here are expected hydrological impacts and expected pollutant loading from the MS4. A receiving water is considered having low expected Stormwater Management Influence for SMAP if they have low expected pollutant loadings and low expected hydrological impacts. Basins that were found to have low Stormwater Management Influence were excluded from the final step of the assessment and the prioritization process. The information used to make our determinations can be found in Appendix A. A description and source of each element used in the of table of Appendix A can be found in Appendix B. These basins were predicted to have low Stormwater Management Influence for SMAP: Mill Creek, Brown-Dash, Central Puget Poverty Bay, Lower Green River -West, Lower North Puget Sound, and Dumas Bay.

The final step of the assessment requires us to assess relative conditions and contributions. This step narrows down our list of receiving waters and basins to be considered for the prioritization process which includes those basins and receiving waters found to have low expected Stormwater Management Influence for SMAP. The basins included in this step are West Hylebos, East Hylebos, Lakota Creek, Joes Creek, Central Puget Redondo Creek, and Central Puget Cold Creek. Assessment descriptions of their relative conditions and contributions are provided below following Table 2-1.

CITY OF FEDERAL WAY | STORMWATER MANAGEMENT ACTION PLANNING
ASSESSMENT & PRIORITIZATION | AUGUST 2022

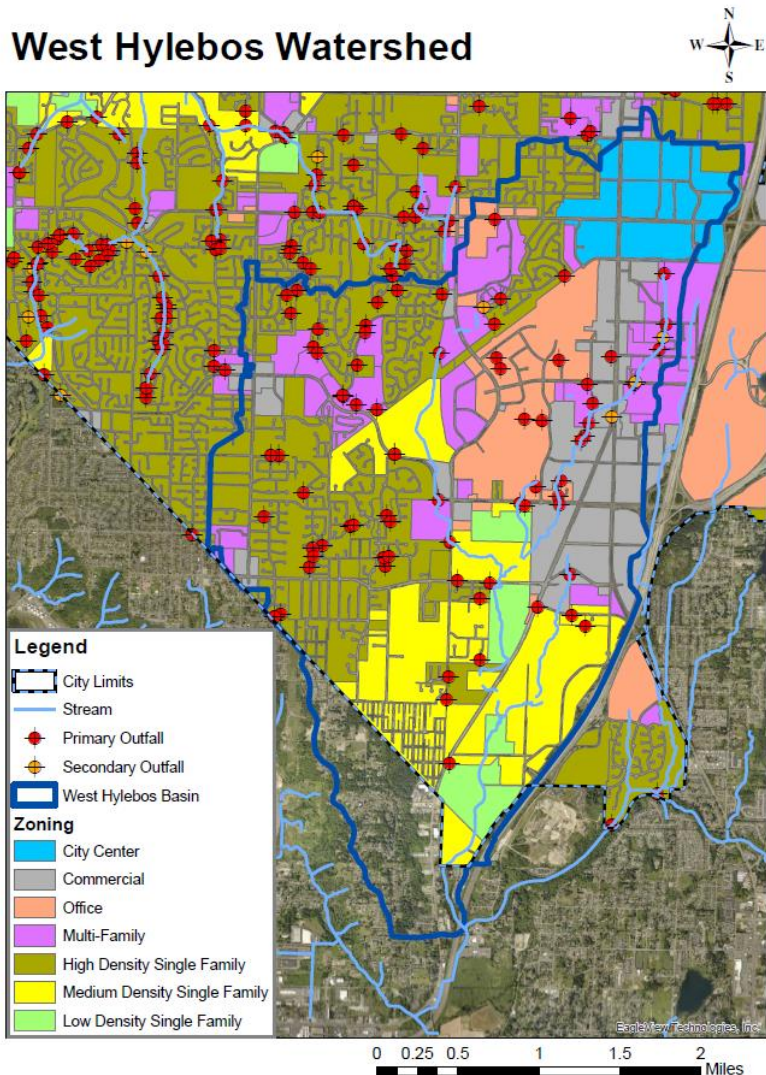
Table 2-1 Basins and Receiving Waters Assessment						
Basins	Area (Mi ²)	Receiving Water	Contributing Area (Mi ²)	Area within City (%)	Impervious (%)*	Primary Zoning*
Central Puget Poverty Bay	1.29	Minor Stream 1	0.0101	100.00	18.35	High Density Single Family: 50.2%
		Minor Stream 2	0.0986	100.00		
		Minor Stream 3	0.0986	100.00		
		Minor Stream 4	0.1732	100.00		
		Minor Stream 5	0.1346	100.00		
		Minor Stream 6	0.0493	100.00		
		Direct Discharges from MS4	N/A	N/A		
Central Puget Redondo Creek	1.25	Redondo Creek	1.1800	86.30	22.36	High Density Single Family: 78.9%
		Steel Lake (flows to Redondo)	N/A	N/A		
Dumas Bay	2.02	Minor Stream 1	0.7832	44.20	11.69	Low Density Single Family: 42.9%
		Minor Stream 2	0.0375	100.00		
		Minor Stream 3	0.0852	100.00		
		Minor Stream 4	0.5525	97.68		
		Direct Discharges to MS4	N/A	N/A		
East Hylebos	6.09	Hylebos	17.8258	62.80	8.40	High Density Single Family: 32%
		North Lake (flows to East Hylebos)	N/A	N/A		
		Weyerhaeuser Lake (flows to East Hylebos)	N/A	N/A		
		Lake Killarney (flows to East Hylebos)	N/A	N/A		
West Hylebos	9.12	Hylebos	17.8258	62.80	29.27	High Density Single Family: 30.5%
		Brook Lake (flows to West Hylebos)	N/A	N/A		
		Panther Lake (flows to west hylebos)	N/A	N/A		
		Klahanee Lake (flows into West Hylebos)	N/A	N/A		
Green River	15.21	Bingamon Creek (flows to Mullen Slough)	N/A	N/A	1.43	High Density Single Family: 65.6%
		Bingamon & Mullen Confluence	N/A	N/A		
		Mullen Slough	5.1603	14.31		
		Star Lake Outlet (flows to Mullen Slough)	N/A	N/A		
		Star Lake (flows to Mullen Slough)	N/A	N/A		
Joe's Creek	2.40	Joes Creek	2.3968	78.72	22.95	High Density Single Family: 81%
Lakota Creek	3.07	Lakota Creek	3.0675	100.00	26.95	High Density Single Family: 73.4%
		Mirror Lake (flows into Lakota)	N/A	N/A		
Lower North Puget Sound	6.67	Barnes Creek (flows into Massey)	N/A	0.00	4.95	High Density Single Family: 52.4%
		Massey Creek	2.0857	0.00		
		Woodmont Creek	0.5602	8.81		
		McSorley Creek	1.5572	0.00		
		Minor Unnamed Stream 1	0.0072	0.00		
		Minor Unnamed Stream 2	0.0033	0.00		
		Minor Unnamed Stream 3	0.0042	0.00		
Direct Discharges to MS4	N/A	N/A				
Mill Creek	15.59	Mill Creek	13.5717	2.10	0.29	High Density Single Family: 81.9%
		Lake Dolloff (flows into Mill)	N/A	N/A		
		Lake Geneva (flows into Mill)	N/A	N/A		
		Minor Stream 1	0.6337	0.00		
Browns-Dash	5.31	Minor Stream 1	0.4741	0	0.29	High Density Single Family Residential: 100%
		Minor Stream 2	0.0158	0		
		Minor Stream 3	0.0115	0		
		Minor Stream 4	0.2055	0		
		Minor Stream 5	0.0339	0		
		Minor Stream 6	0.0111	0		
		Minor Stream 7	0.0117	0		
		Minor Stream 8	0.9579	0		
		Minor Stream 9	0.1861	0		
		Minor Stream 10	0.0940	0		
		Minor Stream 11	0.0445	0		
		Minor Stream 12	0.0805	0		
		Minor Stream 13	0.5479	1.8		
		Minor Stream 14	0.0273	0		
Central Puget Cold Creek	1.06	Cold Creek	0.8374	96	3.46	High Density Single Family: 66.4%
		Easter Lake (flows to Cold Creek)	N/A	N/A		
		Direct Discharges from MS4	N/A	N/A		

* = Data only considers area within City of Federal Way boundary.

Assessment of West Hylebos Creek

The whole Hylebos basin within Federal Way includes the West and East Hylebos sub basins. The Hylebos basin was separated into two sub basins due to its significant size compared to other basins within Federal Way jurisdiction. A majority of the zoning within the basin and jurisdiction was 30.5% for high-density single-family residential, followed by 20.8% zoned for medium-density single-family residential, 13.3% zoned for multi-family residential, 10.1% zoned for office parks which allows for mix of office and compatible light manufacturing activities, 8.2% zoned for commercial enterprises (i.e. Costco, Wal-Mart, Home Depot), 4.9% zoned for low-density suburban estate, 3.8% zoned as City Center Frame (intended to look and feel similar to the City Core and provide a zone of less dense commercial/residential mixed-use development), 3.6% zoned for community businesses, 3.3% zoned as City Core (intended for higher-density, mixed-use designation for office, retail. Government, and residential uses are concentrated), 1.3% zoned for neighborhood business, and 0.2% zoned for professional offices.

Total impervious surfaces area covers 29.3% (2.4 mi²) of the West Hylebos basin within jurisdiction. The impervious area in the West Hylebos is significantly higher than all other basins with a coverage of 2.4 miles squared follow by the Lakota basin with 0.83 miles squared. Based on Federal Way Spill Analysis 2013-2020, 266 of 481 (55.3%) spills detected occurred in this basin. The most common spill was petroleum products (21.8% of spills), followed by sediment (20.0% of spills), and food wastes (18.0%). Most of high trafficked arterial roads are located within the West Hylebos basin.



*Low-Density Single-Family zoning classification for Federal Way is Suburban Estate (SE). SE zones also includes any property within the City that does not have a zone classification.

Majority of the proposed capital improvements project in the SWM Comprehensive Plan was for the West Hylebos both for water quality and drainage. There were 7 proposed water quality projects which includes, a West Hylebos education center site (estimated cost \$1,700,0000), S 359th St culvert replacement (estimated cost \$890,000), S 356th St culvert replacement (estimated cost \$1,400,000), West Hylebos watershed trail (estimated cost \$7,800,000), north fork West Hylebos watershed trail (estimated cost \$5,200,000), West Hylebos basin land acquisition (estimated cost \$2,378,000), and analyzing options for retrofitting hidden pond on Kim's property (estimated cost \$60,000). The 2 drainage capital improvement projects were the 324th and Hwy 99 drainage improvements (estimated cost \$350,000), and upsize pipes at SW Campus Dr (estimated cost \$30,000). The West Hylebos has had many improvement projects over the years.

List of projects since 2004:

- **2004** - West Hylebos Creek Restoration Project that involved log weirs, engineered log jams, log revetments, and augmented existing log jams.
- **2010** - Replaced a failing culvert between S 359th St and S 356th St with a fish passable one.
- **2012** - Acquired conversation property in the basin and future acquisition have been proposed
- **2014** - Regional detention facility retrofit project along S 356th St funded by stormwater retrofit and LID grant among other projects.
- **2016** - Installed permeable surfaces, a rain garden, and natural planting area in conjunction with Town Square Park.
- **2017** - Stream bed restoration to remove gravel and sediment buildup to restore capacity.
- **2017** - Demolished structures on the West Hylebos conservation acquisition property.
- **2019** - Extended the West Hylebos board walk trail to connect trail head to Brooklake Center.



Based on the Puget Sound watershed characterization project metals, nitrogen, and pathogen should be dealt with by restoring source processes. To manage phosphorus, we should be restoring the sinks. As for sediment it should be dealt with by protecting source processes. As critical habitat for multiple species of fish, the goal for the West Hylebos would be to improve habitat, reduce pollutant loading, increase flow control, increase drainage to prevent flooding in areas prone to flooding and ensure there are no fish barriers.

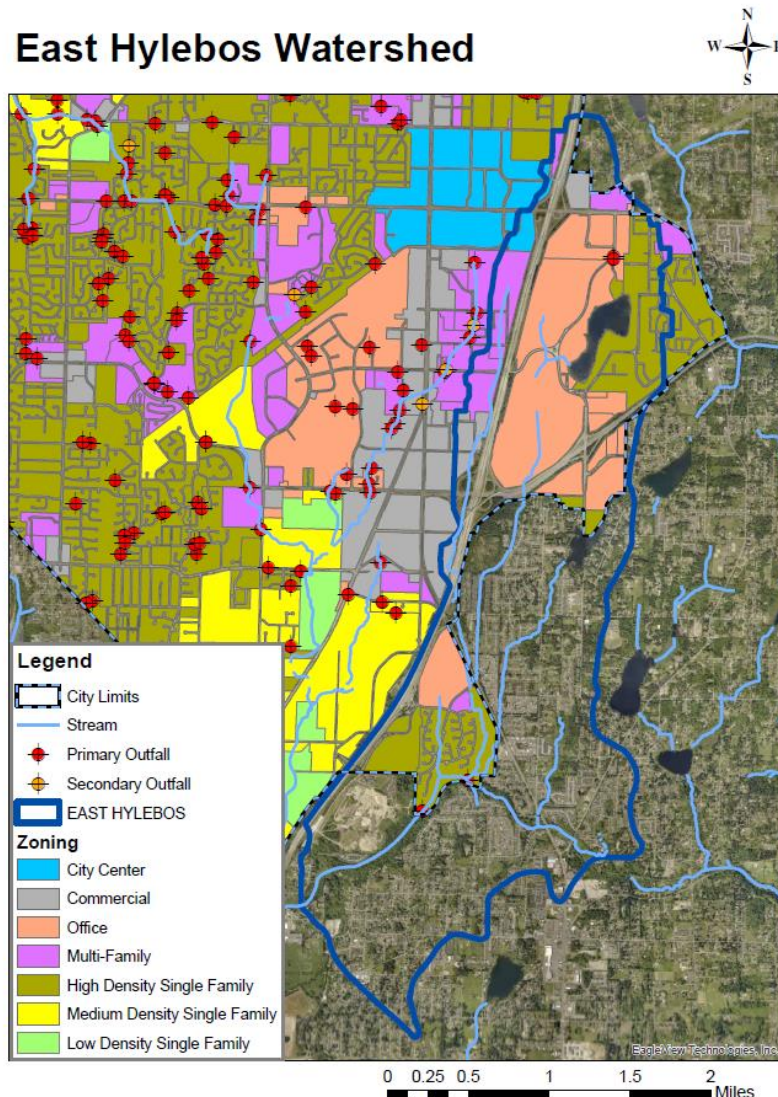
Assessment of East Hylebos

The whole Hylebos basin within Federal Way includes the West and East Hylebos sub basins. The Hylebos basin was separated into two sub basins due to its significant size compared to other basins within Federal Way jurisdiction. Around 32% of the basin is zoned for high density residential, followed by 29% of cooperative park such as the IRG property (formerly owned by Weyerhaeuser) around North Lake, followed by 20% of office parks which allows for light manufacturing activities and offices, followed by 11% zoned for multifamily, followed by 4% for commercial enterprises which includes retailers like Home Depot and Costco (high trafficked big box stores). Total impervious surface area covers 8.4% (0.23 mi²) of basin within jurisdiction.

Based on Federal Way Spill Analysis 2013-2020, 27 of 481 (5.4%) spills occurred in this basin. The most common spill was turbid water, followed by construction related discharges, and finally petroleum products. One potential capital improvement project has been proposed for drainage improvement on 33rd Pl S that involves extending the existing stormwater pipe westward to improve drainage conditions with estimated cost of \$340,000. Due to the fact that there is a large percentage of high-density single-family zones, that the basin is within an urban growth area, a segment of I-5 is within the basin, high trafficked big box stores, we can summarize that the basin has high potential for non-point source runoff impacts.

However, the East Hylebos basin is spawning habitat for fall chinook salmon and winter steelhead, and of the 44.7% of the basin within jurisdiction about 8.7% is impervious surface (about 19.5% impervious if we only consider basin within jurisdiction). With the facts presented and utilizing the management matrix for restoration and protection we have designated the basin for Restoration of Sources Processes and/or Protection of Source Processes specifically for sediment.

East Hylebos Watershed



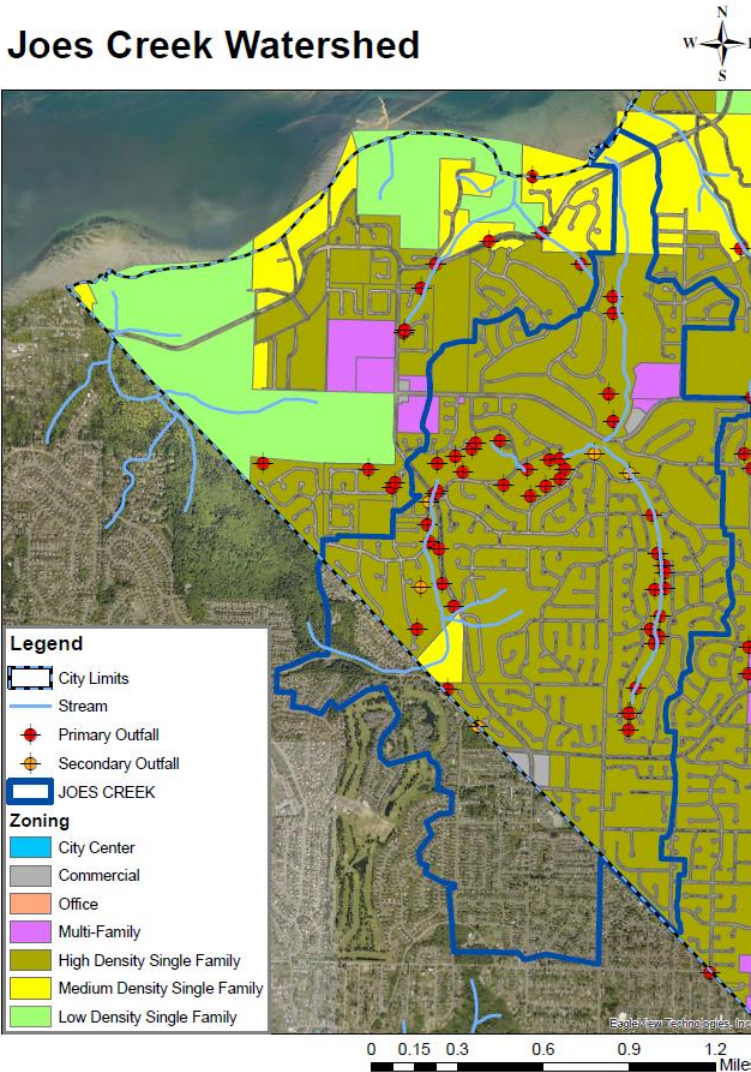
*Low-Density Single-Family zoning classification for Federal Way is Suburban Estate (SE). SE zones also includes any property within the City that does not have a zone classification.

Assessment of Joes Creek

Majority of area is zoned for high-density single-family homes which covers about 81% of the basin within jurisdiction, followed by 2.4% zoned for neighborhood businesses which includes dentist, grocery stores, dry cleaners, banks, etc., followed by 1.5% zoned for multi-family homes, and lastly, 1.2% zoned for medium density single family. Total impervious surface area covers 23.0% (0.43 mi²) of basin within jurisdiction.

Based on Federal Way Spill Analysis 2013-2020, 29 of 481 (6.03%) spills occurred in this basin. The most common spill was petroleum products, followed by sediment, and sewage. A potential capital improvement project mentioned in City of Federal Way’s Surface Water Management Comprehensive Plan Comprehensive to improve water quality is to address the erosions issues in the stream that caused transport of gravel downstream by stabilizing the channel upstream with no estimated cost. The downstream portion of the stream has a 303(d) impairment for temperature based on temperature data from 2008. Joes Creek designated as core summer salmonid habitat and primary contact recreation.

In 2006, Federal Way conducted a salmon habitat restoration project for Joes Creek. This involved new channel design to accommodate modeled 100-year storm (259 ft³/second), replacing a street culvert, and installation of a stilling well to dissipate energy, and creating a wetland at the north end of driving range. Based on the Puget Sound Watershed Characterization Project, Joes Creek should prioritize on restoration of source processes for pathogens and phosphorus; restoration of sinks for metals and nitrogen; and protection of source processes for sediment. Restoration of source processes for pathogen and phosphorus seem like the higher priority because Joes Creek flows through the Twin Lake’s golf course which is a source of excess nutrients due to fertilization and pathogens from water fowl.



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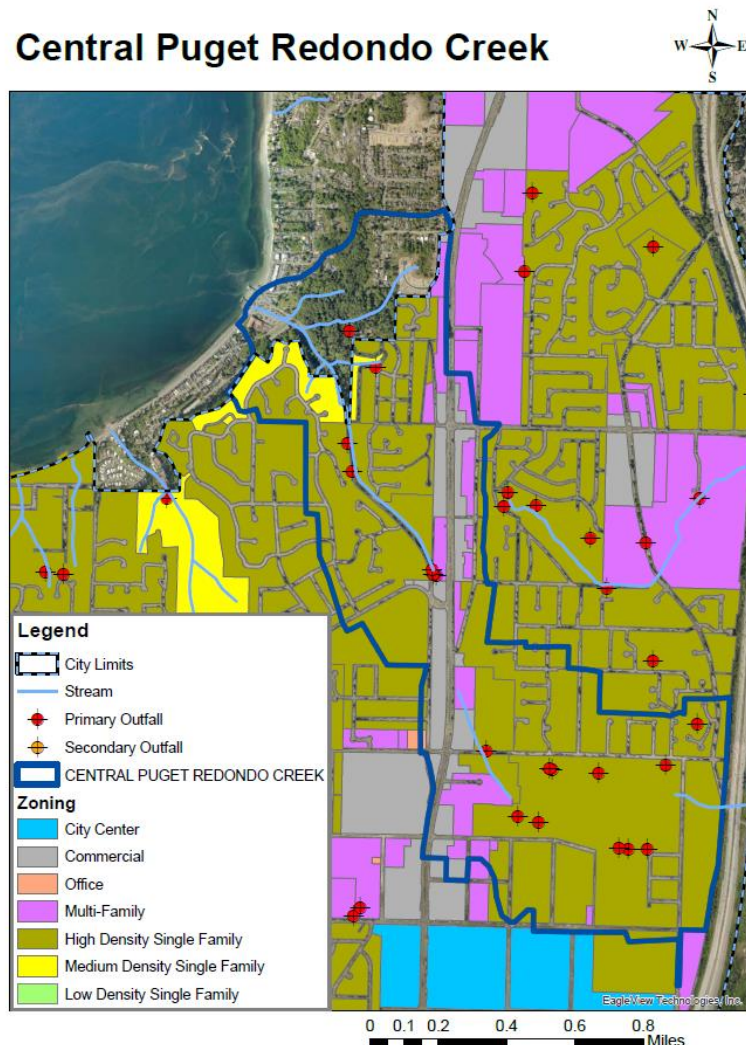
Assessment of Central Puget Redondo Creek

Over 78.9% of the zoning area within the basin and jurisdiction is designated as high-density single family. Followed by 8.8% zoned for multi-family, 8.3% zoned for community business, and 3.7% zoned for medium density single family. Based on zoning data we can expect this basin to be significantly impacted by effects generally caused by high density residential zones. Total impervious surface area covers 22.4% (0.24 mi²) of basin within jurisdiction. Based on Federal Way Spill Analysis 2013-2020, 60 of 481 (12.5%) spills occurred in this basin. The most common spill was turbid water, followed by petroleum products, and finally construction related activity. Disclaimer, the Spill Analysis began before Herrera was contracted to help us with our SWM Comp Plan and revised our watershed delineations, therefore Redondo Creek and Cold Creek share the same Spill Analysis statistics. A couple of potential capital improvement projects have been proposed which includes a creek culvert replacement at 16th Ave S with a fish-passable culvert (estimated cost \$1,100,000) and/or an outfall erosion prevention project for outfall #256 (estimated cost \$160,000). Most recently in 2017, we replaced a failing stormwater conveyance at multiple locations throughout the City which began in the Marine Hill subdivision, to improve drainage and reduce risk of flooding.

In 2009, Redondo Creek was classified as a minor stream due to fish passing barriers which includes a 10-foot-high natural waterfall south of S 293 Pl and downstream of waterfall there is a stream channel with a 12% longitudinal gradient.

Due to percentage of high-density single-family zones, that it's within an urban growth area, and that a segment of SR-99 is within the basin we can assume that the basin has high potential for non-point source runoff loading. The discharge point goes into Poverty Bay and is on the 303(d) list of bacteria. This receiving water basin is not fish passable and only has a presumed presence of fall chinook and winter steelhead according to WDFW. Based on collected information and using the management matrix for restoration and protection we recommend designating the basin for Restoration with Development or Restoration 2. Specifically, on protecting sinks for phosphorus, nitrogen, and metals. Protect source processes for pathogens. Restoring sinks and protect source processes for sediment.

Central Puget Redondo Creek



*Low-Density Single-Family zoning classification for Federal Way is Suburban Estate (SE). SE zones also includes any property within the City that does not have a zone classification.

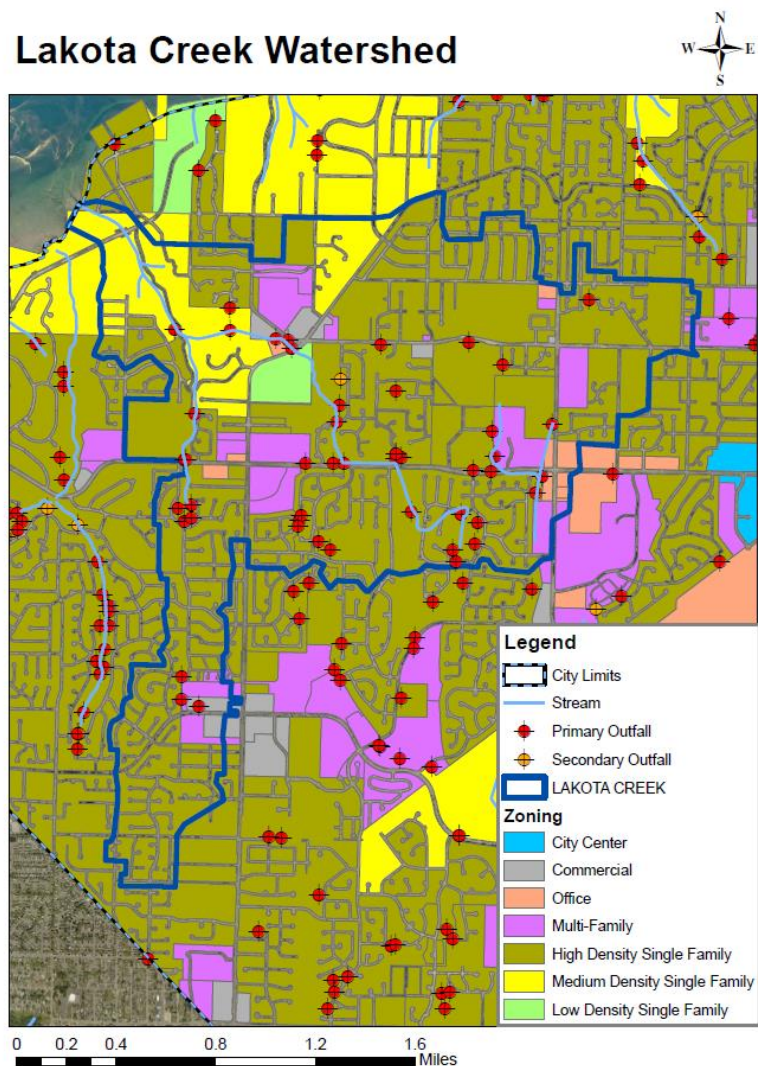
Assessment of Lakota Creek

Zoning within the basin and jurisdiction; majority of the area is zoned for high-density single-family residential with covers about 73.4%, followed by 11.7% zoned for medium-density single family residential, 9.6% zoned for multi-family residential, 1.8% for neighborhood business zones, 1.8% zoned for low-density suburban estate, 1.1% zoned for professional offices, and lastly 0.6% zoned for office parks. Total impervious surface area covers 26.95% (0.83 mi²) of basin within jurisdiction.

Based on Federal Way Spill Analysis 2013-2020, 30 of 481 (6.2%) spills occurred in this basin. The most common spill was sediment, followed by food waste, wash water, and sewage were all tied for the second most common discharge in Lakota identified by our IDDE program. One potential water quality capital improvement project was proposed in the SWM Comprehensive plan which involved considering an alternative design for the additional over pipe over near 31411 3rd PI S due to access difficulties and can potentially be a mitigation project with Sound Transit.

Multiple restoration projects have been completed on Lakota Creek. In 2004, which involved removing invasive and nuisance plants and planting over 6,000 plants and stream restoration improvements along the mainstem and west branch of Lakota Creek. Another in 2005, which involved stream restoration improvements along the east branch of Lakota Creek. Most recently in 2017, we rebuilt a failing berm around Lakota Wetlands detention area to reduce flooding of Lakota Park and Dash Point Road. Based on the Puget Sound Watershed Characterization Project the Lakota basin we should restore its sinks for nitrogen, pathogens, metals, and phosphorus. As for sediment we should be protecting the source processes.

Lakota Creek Watershed



*Low-Density Single-Family zoning classification for Federal Way is Suburban Estate (SE). SE zones also includes any property within the City that does not have a zone classification.

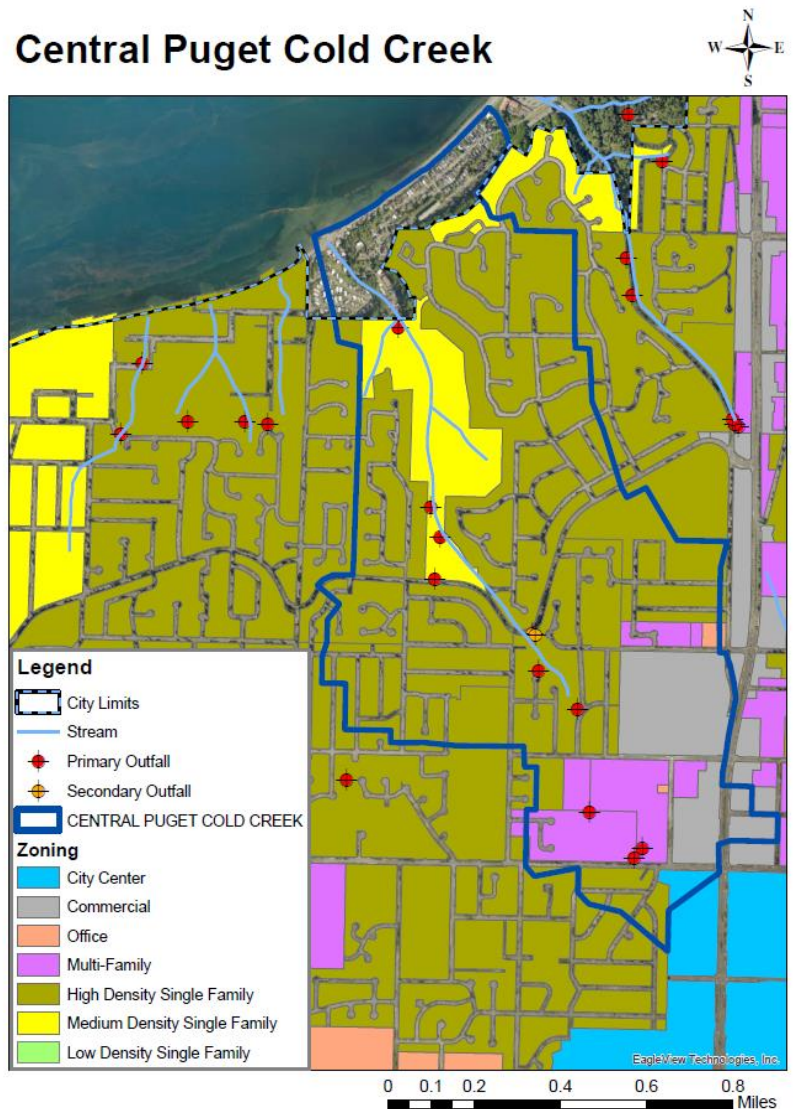
Assessment of Central Puget Cold Creek

A majority of area within the basin and jurisdiction is zoned for high density single family residential at 66.4%, followed by 12% zoned for medium density single family residential, 10.9% zoned for community businesses, 9.6% zoned for multi-family residential, 0.8% zoned for city center frame, and lastly 0.3% for professional offices. Total impervious surfaces area covers 28.2% (0.28 mi²) of the Cold Creek basin within jurisdiction.

Based on Federal Way Spill Analysis 2013-2020, 60 of 481 (12.5%) spills occurred in this basin. The most common spill was turbid water, followed by petroleum products, and finally construction related activity. The Spill Analysis began before Herrera was contracted to help us with our SWM Comp Plan and revised our watershed delineations, therefore Redondo Creek and Cold Creek share the same Spill Analysis statistics.

There was one potential Capital Improvement Project for Cold Creek to improve water quality by performing a Cold Creek culvert replacement due to failing culvert under Marine Hills pool and channel stabilization to address the upstream and downstream erosion with estimated cost of \$3,800,000. Based on the Watershed Characterization Project we should be prioritizing protection of source processes for sediment and pathogen. As for phosphorus, metals, and nitrogen we should be protecting the sinks.

Central Puget Cold Creek



*Low-Density Single-Family zoning classification for Federal Way is Suburban Estate (SE). SE zones also includes any property within the City that does not have a zone classification.

3. Receiving Water Prioritization

This section will go over the prioritization process and determination of each basin’s prioritization rank. For this section of the SMAP development we must develop and implement a prioritization method and process to determine which receiving wear will receive the most benefit from implementation of stormwater facility retrofits, management actions, SWMP actions, land use actions, and others. Below is a rundown of our prioritization procedure. Table 1-2 below shows the final prioritization rankings of each basin.

Prioritization Procedure

Prioritization Index Score (PIS): The ranking and prioritization of basins were determined using a Prioritization Index Score. The PIS was assessed based on five scores that were based on general prioritization principals mentioned on the SMAP Guidance document provided by Ecology. A large PIS means greater prioritization for that basin and basin ranks will be based on their PIS in descending order. Each score is weighted equally when determining the PIS. These 5 scores are named as follows: Impairment Score, Jurisdictional Area Score, Rehabilitation Score, Sediment Disposition Score, and the Demographic Score. Below are descriptions of each score and the elements considered to determine them.

Impairment Score: Purpose of this score is to give higher prioritization to basins that have low to moderate levels of impairment in their receiving waters. This score was assessed using these 5 elements: number of 303(d) impairments, Benthic Index of Biological Integrity (B-IBI) if available, Stream Water Quality Restoration Score, Water Flow Importance Score, and Water Flow Degradation Score. Each element was weighted equally as a score from 1-100 when calculating the impairment score. The mean of the elements was used as the impairment score for each basin. If no B-IBI was available then it was not included in the calculations. Description of each variable used is in Appendix B.

A few notes are that the number of 303(d) impairment score was calculated by dividing the number of 303(d) impairments for a basin by the maximum number of impairments possible (which is 9) between the basins considered. The inverse score of the B-IBI was used to calculate the impairment score as a higher score would mean it is less impaired therefore to get the B-IBI impairment score it was subtracted from 100 to obtain a score between 1-100.

Calculations:
$$\text{Impairment Score} = \frac{\left(\left(\frac{A}{9}\right)*100\right) + (100-B) + C + D + E}{5}$$

Legend:

A = Number of 303(d) impairment(s)

D = Water Flow Importance Score

B = B-IBI

E = Water Flow Degradation Score

C = Stream WQ Score

Jurisdictional Area Score: Purpose of this score is to give higher prioritization to basins that are within our jurisdictional boundary therefore allowing the City to exert greater influence. This score is based on the percentage of area of the basin within our jurisdiction as a score between 1-100.

Calculations: *Jurisdictional Area Score = % of basin within jurisdictional boundary*

Rehabilitation Score: Purpose of this score is to give higher prioritization to basins where regional rehabilitation efforts are focused or are regionally identified as important. This score was mainly determined with these elements: number of WRIA projects, number of critical habitat/species, number of (Model Toxics Control Act) MTCA cleanup sites, number of Salmon Recovery Plan projects, and number of Superfund sites. Each element was weighted equally in calculations. If no information was available for an element then it was not included in the calculations. Of the six basins considered for prioritization 3 out of 6 only had MTCA sites and none of the other elements since no information was found. None of the receiving water basins were included in current WRIA plans.

A few notes are that the number of Salmon Recovery Plan involvements, number of MTCA cleanup sites, and number of critical habitats/species score was calculated by dividing the number of those elements for each basin for a basin by the maximum number possible between the basins considered. Similar to the process for 303(d) impairment score used for the impairment score.

Calculations: *Rehabilitation Score* =
$$\frac{\left(A + \left(\frac{B}{2} \right) * 100 \right) + \left(\left(\frac{C}{53} \right) * 100 \right) + \left(\left(\frac{D}{3} \right) * 100 \right)}{4}$$

Legend:

A = Number of Superfund Sites

C = Number of MTCA cleanup sites

B = Number of critical habitats/species

D = Number of Salmon Recovery Plan involvements

Sediment Disposition Score: Purpose of this score is to give higher prioritization to basins with direct MS4 discharges to shorelines with low to no drift as it causes sediment/pollution accumulation in comparison high energy drift cells. This score was determined based on the number of direct MS4 discharges to shorelines with no appreciable drift. There are two shorelines that have no appreciable drift for the basins considered: Dumas Bay and the Hylebos Waterway. All basins only have a maximum of one MS4 discharge into no appreciable drift shorelines.

Calculations: *Sediment Disposition Score = A * 100*

Legend:

A = Number of direct MS4 discharges into shoreline with no appreciable drift

Demographic Score: Purpose of this score is to give higher prioritization to basins with overburdened communities where water quality issues and human health impacts overlap. This score was determined based on the percentage of overburdened communities within the basin.

Calculations: *Demographic Score = % of overburdened communities within basin*

Table 1-2 Basin Prioritization Rankings		
Rank	Basin	PIS
1	West Hylebos	80.12
2	Lakota Creek	62.43
3	East Hylebos	58.03
4	Joe's Creek	55.42
5	Central Puget Redondo Creek	37.20
6	Central Puget Cold Creek	36.81

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Exhibit A
Assessment Table

Exhibit B

Descriptions of Elements

Assessment Information Collected

This section reviews the information collected for the assessment of each basin before the prioritization process. It goes over where the information was obtained, why it was collected, and what they represent.

Basin Total/Contributing Areas

The total and contributing area of each basin was calculated using Federal Way's GIS data. Total basin area represents its area within or outside of Federal Way's jurisdiction. Contributing area represents the watershed for each receiving water it was calculated for within and outside of Federal Way's jurisdiction.

Drift Cells

This information represents which way the coastline water flows if they have drift. The drift cells tell us if pollutants from direct MS4 discharges will be dispersed or accumulate at the shoreline of concern. This information was collected from WA DOE Coastal Atlas Map.

Net Deposition

This information lets us know if sediment/pollutants accumulates in shorelines that receiving direct MS4 discharges. Ports and Bays are considered areas of net deposition due to lack of shoreline drift. This information is based on drift cell data collected from WA DOE Coastal Atlas Map.

Impervious Surfaces

Percentage of impervious surfaces was estimated using GIS data from Federal Way's GIS database. Estimated area of impervious surfaces was limited to jurisdictional boundary. Impervious surfaces included, but not limited to roads, roofs, sidewalks and driveways.

Zoning Classification

Land use zoning classification was determined using Federal Way's GIS data. Low, medium, and high density residential were determined using Federal Way's classification. Suburban estate zones are low density residential, residential zoning with over 15,000 sqft are medium density and residential zoning below 15,000 sqft are high density residential.

Urban Growth Area

This represents geographic area defined in plans or regulations as desirable and appropriate for growth. This information was collected from the US Census Bureau.

Public Shellfish Harvesting

This represents the public recreation shellfish harvesting status for the shorelines of each basin. Their water quality classifications are either approved, conditionally approved, unclassified, or closed due to pollution. This information was obtained from WA DOH.

Commercial Shellfish Harvesting

This information determines if commercial shellfish harvesting is approved, conditionally approved, prohibited due to pollution, or prohibited due to close proximity of a wastewater treatment plant outfall. This information was obtained from WA DOH.

Hatcheries

This represents any fish hatcheries that are located within each of the basins. This information was obtained from WDFW.

Swimming Beaches

This determines if there are any swimming beaches in each basin. This information was collected from King County Small Lakes Recreation Guide.

Demographic Index

This information represents the coverage of overburdened communities within each of the basins. The index is a combination of percent low-income and percent minority added together and divided by two. Information was collected from EPA EJScreen. This was calculated for each basin using GIS. Percentage of coverage was converted to score between 1-100 for the Prioritization Index.

Environmental Health

This information represents the consideration of environmental hazards for overburdened communities. This data includes lead risk from housing, proximity to hazardous waste treatment storage and disposal facilities, proximity to Superfund sites, proximity of RMP facilities, and wastewater discharges. This information was collected from WA DOH Washington Environmental Health Disparities Map. This was calculated for each basin using GIS.

Stream Water Quality

This information represents the general water quality for each basin based on export potential and degradation for sediment, phosphorus, metals, nitrogen, and pathogens. This data was collected from WA DOE Watershed Characterization Project. The score for each basin was calculated using GIS. For the restoration and protection goal considerations of each basin during the assessment, each parameter used to calculate the general stream water quality.

Water Flow Importance

This information represents the importance of water flow for each basin. This takes into consideration water delivery, surface storage, recharge, and discharge to determine the relative importance in maintaining overall water flow processes in a non-degraded setting. This information was collected from the WA DOE Watershed Characterization Project. Calculations for each basin was done using GIS.

Water Flow Degradation

This information represents the degradation of water flow for each basin. This takes into consideration water delivery, surface storage, recharge, and discharge. Degradation to these processes results in accelerated movement of surface flows downstream therefore increasing flooding and erosion. This information was collected from the WA DOE Watershed Characterization Project. Calculations for each basin was done using GIS.

Stream B-IBI

This information represents the overall biological integrity of receiving waters within the basin based on macroinvertebrates sampled and their biodiversity. This information was collected from Puget Sound Stream Benthos database.

Fish Habitat

This information represents the presence of fish species in each receiving water of each basin. Therefore, setting water quality criteria if certain species are presumably present. This information was collected from WDFW.

Number of 303(d) Impairments

This information represents any 303(d) water impairments for each receiving water in each basin. Receiving water with more impairments scored higher in prioritization process. This information was collected WA DOE Water Quality Atlas.

Total Maximum Daily Load

This information represents any TMDL requirements imposed on receiving waters in each basin. This information was collected from WA DOE.

Potential CIP to Improve Water Quality

This information list all of the potential capital improvement projects that would improve water quality proposed by the City. This information was collected from the City of Federal Way SWM Comprehensive Plan.

Potential CIP to Improve Drainage

This information list all of the potential capital improvement projects that would improve water drainage proposed by the City. This information was collected from the City of Federal Way SWM Comprehensive Plan.

Number of WRIA Plan/Project

This information list all of the WRIA projects that involve the receiving waters of each basin. No projects were found for any receiving waters of the basin considered. This information was collected from WA DOE.

Number of Critical Habitat/Species

This information list all of the critical habitats and species for the receiving waters of each basin. This information was collected from the U.S. Fish and Wildlife Services.

Number of Superfund Sites

This information list all of the Superfund cleanup sites for each basin. This information was collected from WA DOE and EPA.

Number of MTCA Cleanup Sites

This information list all of the Model Toxic Characterization Act cleanup sites for each of the basins considered. This information was collected from WA DOE

Number of Salmon Recovery Plans

This information lists all of the Salmon Recovery projects that involved receiving waters of each basin. This information was collected from the Salmon Recovery Portal which is ran by the Washington State Recreation and Conservation Office.

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APPENDIX B

West Hylebos SMAP Project Scope Definitions

City of Federal Way
Public Works: Capital Projects
Project Scope Definition

Project: Hidden Pond on Kim's Property

Location: East of Pac Highway and North of S 373rd St.

Basin: West Hylebos

Date:

Priority Score: 11

Program Funding Components:

SWM CIP (304-3100-XXX)	\$60,000
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TOTAL FUNDS ASSIGNED TO THIS PROJECT:	\$0
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Responsible Program Manager: Program Manager

Responsible Project Manager/ Project Engineer: Project Manager

Problem Description:

This pond receives stormwater runoff from Pacific Highway S and discharges to the West Hylebos. The pond was initially constructed by a private land owner and little is known about the design and the current stormwater treatment function of the pond. A 2015 report from HDR identified low dissolved oxygen levels in the pond and determined that these oxygen levels likely prohibit fish species from inhabiting the pond under its current conditions.

Herrera evaluated the feasibility of using the site for advanced wetland mitigation, but the assessment indicated a significant degree of uncertainty regarding potential value as an advanced mitigation site for wetland impacts due to the somewhat high level of ecological functions being performed in the wetland's current condition, and due to the limited opportunities for wetland creation at the site. It is unlikely that Sound Transit would invest in using the site for advanced wetland mitigation due to this uncertainty. Given that this is a publicly-owned site, the City would like to evaluate how to maximize the benefits to the community and the environment.

Project Solution:

Perform a feasibility study to assess options for utilizing the site. The study would involve public participation, additional field assessment, alternatives analysis, and conceptual design.

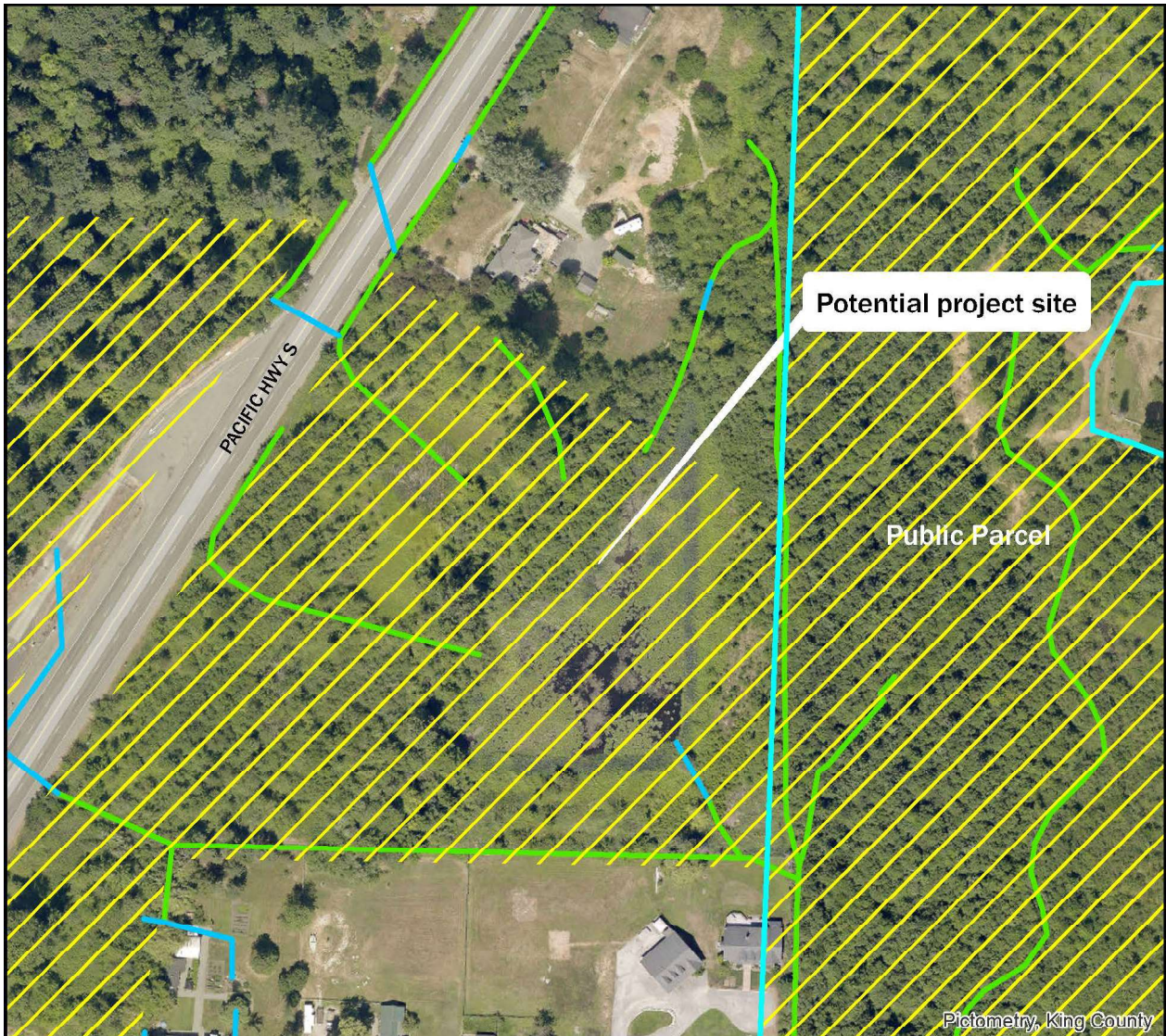
Cost Estimate Assumptions:

The cost estimate is based on consultant experience with similar projects. The cost assumes \$15,000 for public participation, \$10,000 for field assessment, \$15,000 for alternatives analysis, and \$10,000 for conceptual design. The total cost includes an additional 20% for City project management.

Project Scope Definition:

Hidden Pond on Kim's Property

Vicinity Map:



<p>Legend</p> <p>Existing features</p> <ul style="list-style-type: none">Stormwater pipeStreams and culverts		<p>Federal Way Stormwater CIP Update Hidden Pond on Kim's Property</p> <p>0 100 200 400 Feet</p> <p> HERRERA King County, Aerial (2017)</p>
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Project Scope Definition:

Hidden Pond on Kim's Property

Cost Estimate:

**City of Federal Way, Public Works: Capital Project
Project Scope Definition
Hidden Pond on Kim's Property**

Authorized Funding			
SWM CIP			\$ 60,000
TOTAL PROJECT FUNDING			\$ 60,000
Estimated Project Cost		\$ 50,000	
Other Project Cost			
City Management	20%	\$ 10,000	
Total Project Cost			\$ 60,000

Project Scope Definition:

Hidden Pond on Kim's Property

Project Strategy:

Professional Design Services:

To be filled out by City.

Construction:

To be filled out by City.

Issues and Concerns:

ADA:

Historic and/or Cultural Preservation:

Operations and Maintenance:

Program Delivery:

Sustainability:

Post Construction Maintenance:

Communications and Public Outreach:

Signage Considerations:

Right-of-Way/Access:

Project Scope Definition:

Hidden Pond on Kim's Property

Permit and Regulatory Considerations:

Project Schedule:

Start Date:

Key Milestones:

Project Completion Date:

Project Constraints and Uncertainties:

- The site contains a high amount of vegetative cover from invasive species such as fragrant waterlily (*Nymphaea odorata*), yellow flag iris (*Iris pseudacorus*), reed canarygrass (*Phalaris arundinacea*), creeping buttercup (*Ranunculus repens*), and Himalayan blackberry (*Rubus armeniacus*). This vegetation community provides the opportunity for enhancement via invasive species removal and revegetation with native species.
- The resulting project may be a candidate for grant funding

END

City of Federal Way
Public Works: Capital Projects
Project Scope Definition

Project: South 356th Street Culvert Replacement

Location: West Hylebos Creek crossing of S. 356th Street

Basin: West Hylebos

Date:

Priority Score: 66

Program Funding Components:

SWM CIP (304-3100-XXX)

\$1,400,000

TOTAL FUNDS ASSIGNED TO THIS PROJECT:

\$0

Responsible Program Manager: Program Manager

Responsible Project Manager/ Project Engineer: Project Manager

Problem Description:

The twin 36-inch culverts have rusted through at the seams causing the pipe bedding and road embankment fill to wash downstream. In addition, if the Brook Lake Dam were to fail, the culvert lacks capacity to convey the flood flow. Soils are soft in this area, so a replacement culvert may need pin pile support or other geotechnical stabilization.

Project Solution:

Replace the rusted culverts with larger box culverts that meet WDFW fish passage criteria. Consider the potential impacts of Brook Lake Dam failure and whether the culvert can / should be upgraded to convey flood flow. This project will be scheduled to occur with the street widening project for S 356th Street. A dam break alternative analysis will be included as part of the project to consider options such as fortifying the road rather than making the culvert larger.

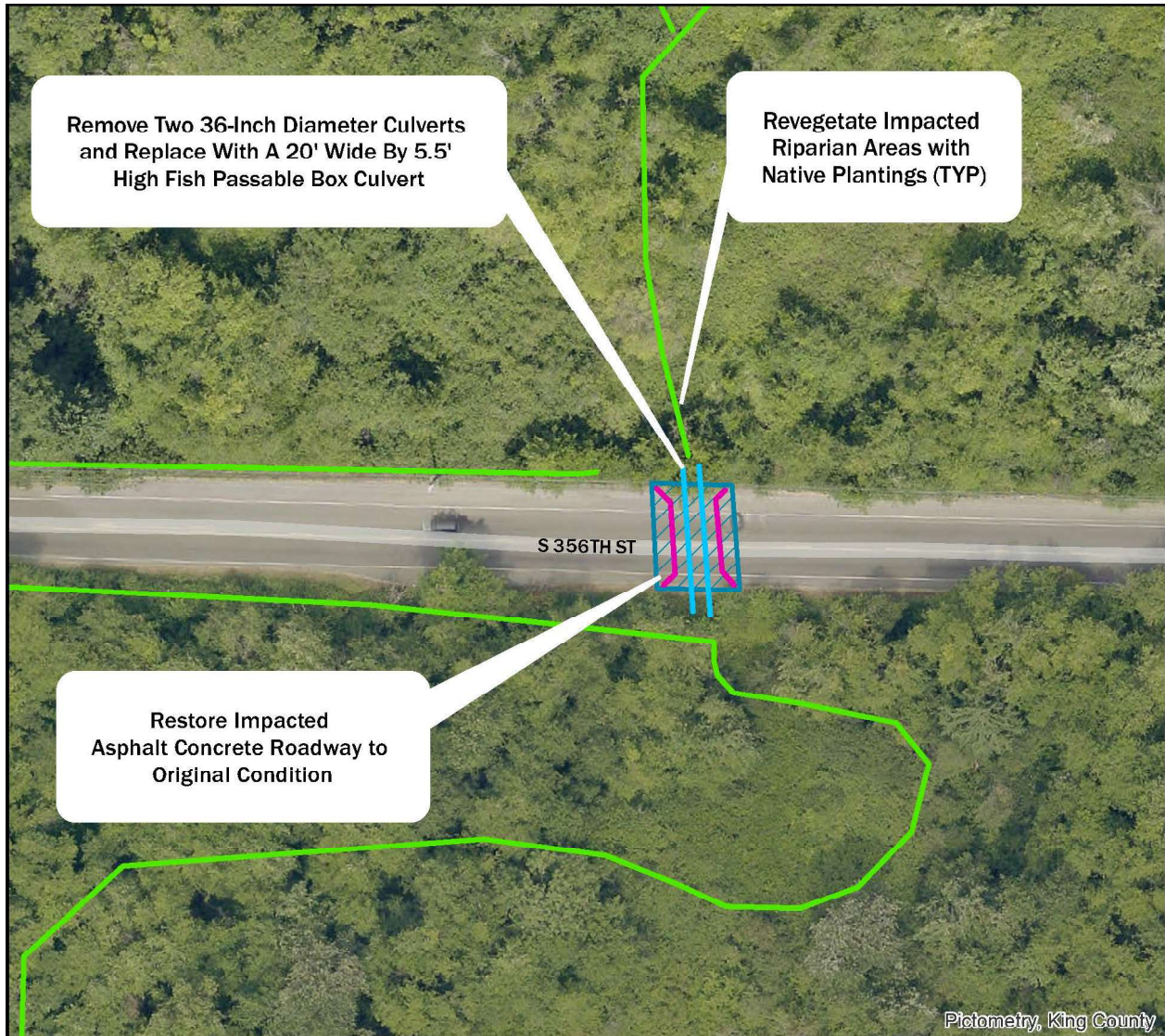
Cost Estimate Assumptions:

Cost estimate based on replacement of the culverts with a 50' long by 20' wide fish passable design that can convey the flood flow and permitting for construction in a stream. The cost estimate also includes the cost of hydraulic modeling and the dam failure alternatives assessment.

Project Scope Definition:

S 356th Street Culvert Replacement

Vicinity Map:



<p>Legend</p> <p>Existing features</p> <ul style="list-style-type: none"> Stormwater pipe Streams and culverts <p>Proposed features</p> <ul style="list-style-type: none"> Storm drain pipe Proposed culvert Roadway restoration 		<p>Federal Way Stormwater CIP Update S 356th Street Culvert Replacement</p> <p>0 37.5 75 150 Feet</p> <p>HERRERA </p> <p>King County, Aerial (2017)</p>
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Project Scope Definition:

S 356th Street Culvert Replacement

Cost Estimate:

City of Federal Way, Public Works: Capital Project
Project Scope Definition
South 356th Street Culvert Replacement

Authorized Funding			
SWM CIP		\$	950,000
Expected Grant Funding		\$	450,000
TOTAL PROJECT FUNDING			\$ 1,400,000
Estimated Construction Cost		\$	759,500
Design Cost			
Site Survey		\$	20,000
Geotechnical Evaluation		\$	20,000
Feasibility, Alternatives Analysis and H&H Modeling		\$	114,000
Permitting		\$	75,000
Project Design		\$	150,000
			\$ 379,000.00
Other Construction Cost			
Construction Management	8%	\$	61,000
Construction Administration	10%	\$	76,000
Construction Inspection	10%	\$	76,000
Construction Contingency	10%	\$	76,000
			\$ 289,000
Total Project Cost		\$	1,400,000

Project Scope Definition:

S 356th Street Culvert Replacement

Project Strategy:

Professional Design Services:

To be filled out by City.

Construction:

To be filled out by City.

Issues and Concerns:

ADA:

Historic and/or Cultural Preservation:

Operations and Maintenance:

Program Delivery:

The project should be scheduled to coincide with the expansion of SW 356th St and the West Hylebos Trails project.

Sustainability:

The culvert should be fish passable and should consider the possible flow resulting from an upstream dam break.

Post Construction Maintenance:

Communications and Public Outreach:

Signage Considerations:

Right-of-Way/Access:

Project Scope Definition:

S 356th Street Culvert Replacement

Permit and Regulatory Considerations:

- CWA Section 404 (USACE, NWP 3 - Maintenance)
- CWA Section 401 (Ecology, Certified through NWP 3)
- Hydraulic Project Approval (WDFW)
- SEPA DNS or MDNS
- City Review/Approval
- Critical Areas Permit with mitigation

Project Schedule:

Start Date:

Key Milestones:

Project Completion Date:

Project Constraints and Uncertainties:

- Hydraulic modeling will be needed to size the culvert. Consider oversizing the culvert to accommodate the wide flood plain.
- Heavy traffic on roadway: temporary traffic control will be required throughout construction
- Streamflow diversion and/or a flow bypass pipe/pumping likely needed
- Flood plain analysis should be performed to determine how often the flood plain is engaged and to what degree the road acts as a dam.
- The road is rather low compared to the water surface. A pipe arch may not fit in this location. A two-culvert design should be considered due to the low roadway with a lower-elevation culvert and a higher overflow culvert.
- The project may be a candidate for grant funding due to fish passage

END

City of Federal Way
Public Works: Capital Projects
Project Scope Definition

Project: 324th and 99 Drainage Improvements

Location:

Basin: West Hylebos

Date:

Priority Score: 11

Program Funding Components:

SWM CIP (304-3100-XXX)

\$350,000

TOTAL FUNDS ASSIGNED TO THIS PROJECT:

\$0

Responsible Program Manager: Program Manager

Responsible Project Manager/ Project Engineer: Project Manager

Problem Description:

Street flooding has occurred along Highway 99 just north of S 324th Street. The cause of the problem is not known. There has been occasional flooding during intense storms. No obstructions were found in the pipe during a recent inspection.

Project Solution:

This project will include three phases: a drainage study with modeling and alternatives assessment, design, and construction. Two options will be considered during the modeling phase: Increase capacity in the system or provide upstream retention. Modeling is required to identify the location of capacity constraints.

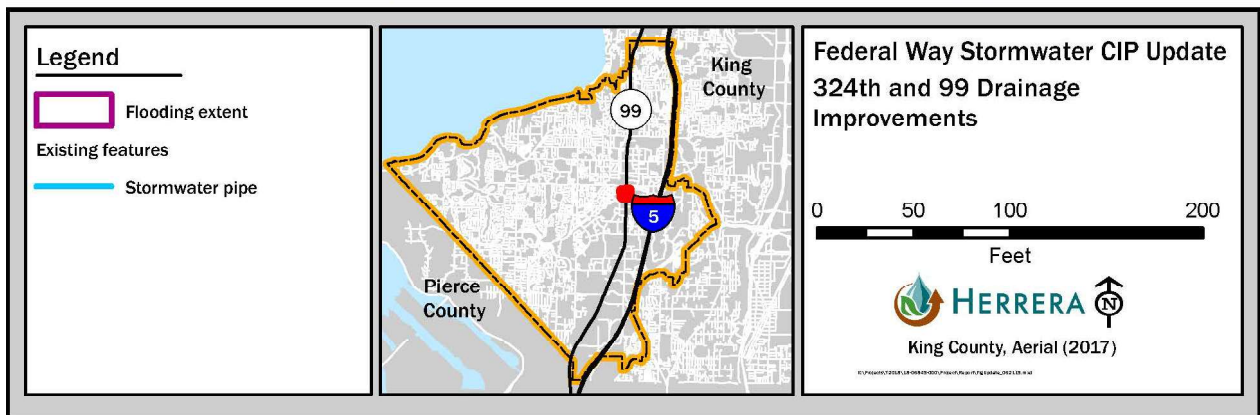
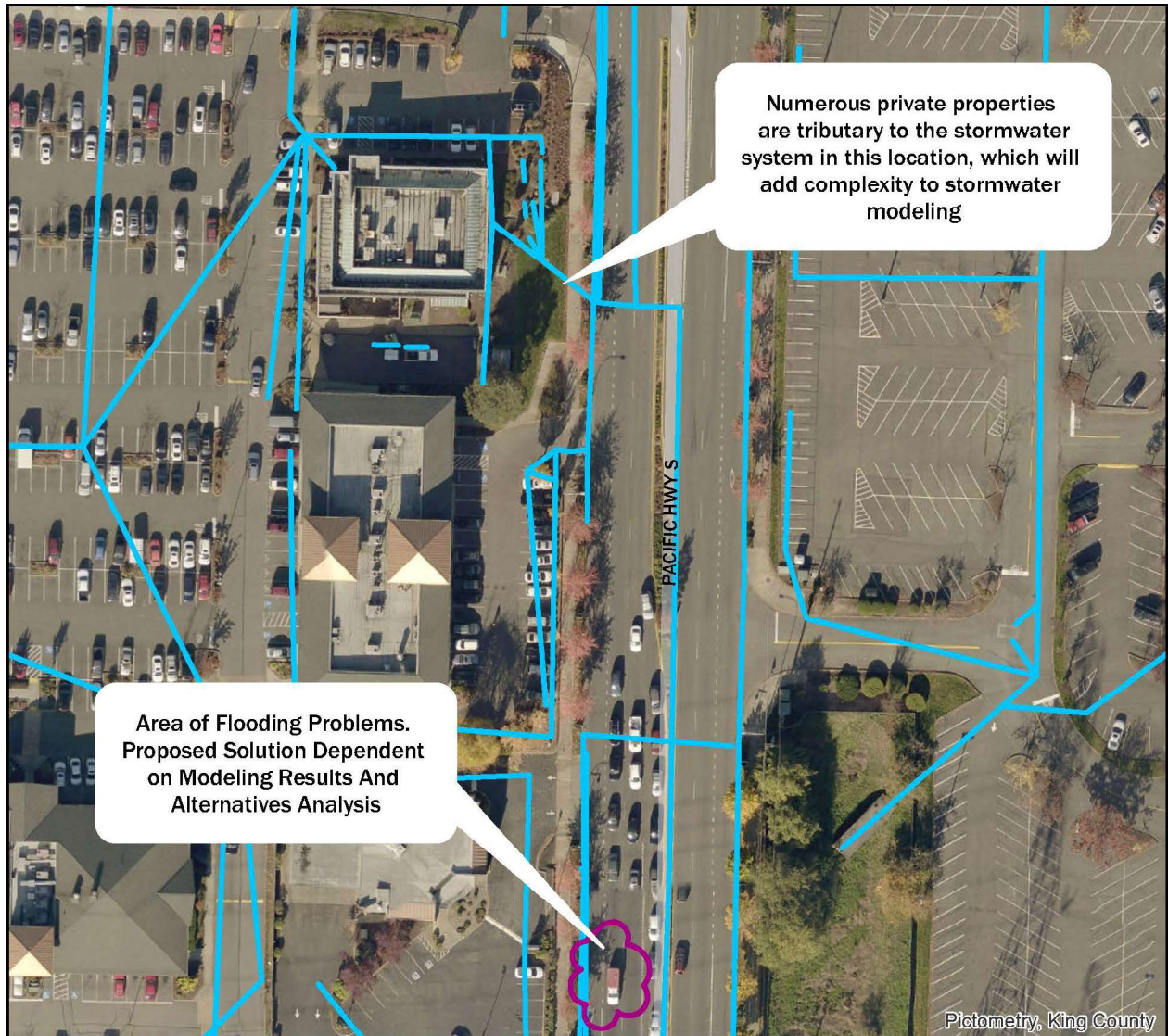
Cost Estimate Assumptions:

The cost estimate includes the cost of the study, design, and a construction allowance based on consultant experience with similar projects.

Project Scope Definition:

324th and 99 Drainage Improvements

Vicinity Map:



Project Scope Definition:

324th and 99 Drainage Improvements

Cost Estimate:

City of Federal Way, Public Works: Capital Project
Project Scope Definition
324th and 99 Drainage Improvements

Authorized Funding			
	SWM CIP		\$ 350,000
	TOTAL PROJECT FUNDING		\$ 350,000
Estimated Construction Cost		\$ 200,000	
Design Cost			
	Survey for Modeling	\$ 10,000	
	Survey for Design	\$ 10,000	
	Stormwater Modeling	\$ 20,000	
	Alternatives Assessment	\$ 10,000	
	Permitting	\$ 5,000	
	Project Design	\$ 20,000	
			\$ 75,000.00
Other Construction Cost			
	Construction Management	8% \$ 16,000	
	Construction Administration	10% \$ 20,000	
	Construction Inspection	10% \$ 20,000	
	Construction Contingency	10% \$ 20,000	
			\$ 76,000
Total Project Cost			\$ 350,000

Project Scope Definition:

324th and 99 Drainage Improvements

Project Strategy:

Professional Design Services:

To be filled out by City.

Construction:

To be filled out by City.

Issues and Concerns:

ADA:

Historic and/or Cultural Preservation:

Operations and Maintenance:

Program Delivery:

Sustainability:

Post Construction Maintenance:

Communications and Public Outreach:

Signage Considerations:

Right-of-Way/Access:

Project Scope Definition:

324th and 99 Drainage Improvements

Permit and Regulatory Considerations:

Project Schedule:

Start Date:

Key Milestones:

Project Completion Date:

Project Constraints and Uncertainties:

END

City of Federal Way
Public Works: Capital Projects
Project Scope Definition

Project: South 359th Culvert Replacement Project

Location: South of 359th Street

Basin: West Hylebos

Date:

Priority Score: 60

Program Funding Components:

SWM CIP (304-3100-XXX)

\$890,000

TOTAL FUNDS ASSIGNED TO THIS PROJECT:

\$0

Responsible Program Manager: Program Manager

Responsible Project Manager/ Project Engineer: Project Manager

Problem Description:

The culvert under S 359th St includes a large upstream control structure and a system of weirs downstream. The control structure may reduce flows downstream. Though the culvert and weirs are not mapped as fish passage barriers, they are not fish-passable due to the drops caused by the downstream weirs.

Project Solution:

The City would like to replace the culvert and regrade the stream by removing the downstream weirs so that the system is fish-passable and restore in-stream habitat.

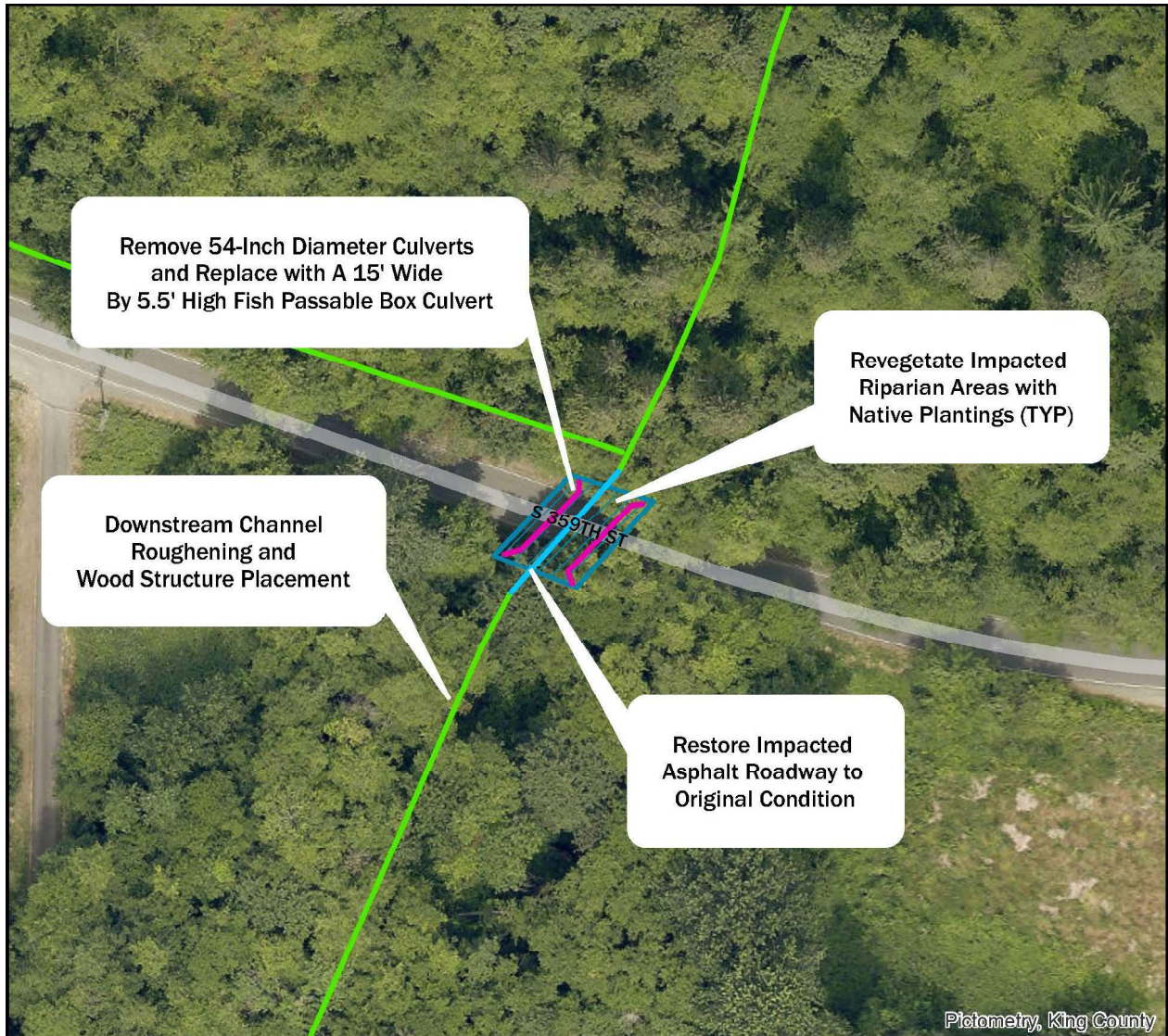
Cost Estimate Assumptions:

Cost estimate based on replacing the culvert with a 40' long by 15' wide fish-passable culvert and regrading the stream. The cost for removing existing structures is expected to be significant. The estimate also includes hydraulic modeling for downstream impacts of removing the existing control structure and weirs and channel roughening downstream due to the high slope.

Project Scope Definition:

South 359th Culvert Replacement Project

Vicinity Map:



<p>Legend</p> <p>Existing features</p> <ul style="list-style-type: none"> Stormwater pipe Streams and culverts <p>Proposed features</p> <ul style="list-style-type: none"> Storm drain pipe Proposed culvert Roadway restoration 		<p>Federal Way Stormwater CIP Update South 359th Culvert Replacement Project</p> <p>0 37.5 75 150 Feet</p>
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Project Scope Definition:

South 359th Culvert Replacement Project

Cost Estimate:

**City of Federal Way, Public Works: Capital Project
Project Scope Definition
South 359th Street Culvert Replacement**

Authorized Funding

SWM CIP		\$	890,000
TOTAL PROJECT FUNDING		\$	890,000

Estimated Construction Cost \$ 455,700

Design Cost

Site Survey	\$	10,000
Geotechnical Evaluation	\$	15,000
Feasibility, Alternatives Analysis and H&H Modeling	\$	68,000
Permitting	\$	75,000
Project Design	\$	90,000
		<hr/>
		\$ 258,000.00

Other Construction Cost

Construction Management	8%	\$	36,000
Construction Administration	10%	\$	46,000
Construction Inspection	10%	\$	46,000
Construction Contingency	10%	\$	46,000
		\$	174,000

Total Project Cost \$ 890,000

Project Scope Definition:

South 359th Culvert Replacement Project

Project Strategy:

Professional Design Services:

To be filled out by City.

Construction:

To be filled out by City.

Issues and Concerns:

ADA:

Historic and/or Cultural Preservation:

Operations and Maintenance:

Program Delivery:

Sustainability:

The replaced system should be fish-passable.

Post Construction Maintenance:

Communications and Public Outreach:

Signage Considerations:

Right-of-Way/Access:

Project Scope Definition:

South 359th Culvert Replacement Project

Permit and Regulatory Considerations:

- CWA Section 404 (USACE, NWP 3 - Maintenance)
- CWA Section 401 (Ecology, Certified through NWP 3)
- Hydraulic Project Approval (WDFW)
- SEPA DNS or MDNS
- City Review/Approval
- Critical Areas Permit with mitigation. Due to the wetlands upstream and downstream permitting should consider potential upstream wetland reduction resulting from removing the control structure.

Project Schedule:

Start Date:

Key Milestones:

Project Completion Date:

Project Constraints and Uncertainties:

- A hydraulic analysis should be performed to evaluate impacts on upstream wetlands and the downstream areas impacted by greater flows.
- Channel roughing will likely be needed downstream due to the steep slope and the planned weir removal.
- Wood structures should be placed to provide fish habitat.

END

City of Federal Way
Public Works: Capital Projects
Project Scope Definition

Project: Upsize Pipes at SW Campus Dr. West of 9th Ave SW

Location: SW Campus Dr. West of 9th Ave SW

Basin: West Hylebos

Date:

Priority Score: 11

Program Funding Components:

SWM CIP (304-3100-XXX)

\$30,000

TOTAL FUNDS ASSIGNED TO THIS PROJECT:

\$0

Responsible Program Manager: Program Manager

Responsible Project Manager/ Project Engineer: Project Manager

Problem Description:

Two storm drain laterals on SW Campus Dr. are undersized and cause flooding in the roadway. Due to the recent HMA overlay on SW Campus Dr., the City would prefer to limit impacts to the road surface.

Project Solution:

Pipe bursting techniques should be used to replace the existing 8 inch diameter laterals with 12 inch stormwater pipes to increase capacity in the system.

Cost Estimate Assumptions:

The cost estimate for this project is based on the cost for replacing two pipes using pipe bursting techniques.

Project Scope Definition:

Upsize Pipes at SW Campus Dr. West of 9th Ave SW

Vicinity Map:



<p>Legend</p> <p>Existing features</p> <ul style="list-style-type: none">Stormwater pipeStreams and culverts <p>Proposed features</p> <ul style="list-style-type: none">Storm drain pipeProposed culvert		<p>Federal Way Stormwater CIP Update Upsize Pipes at SE Campus Dr. West of 9th Ave SW</p> <p>0 50 100 200 Feet</p> <p> HERRERA King County, Aerial (2017)</p>
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Project Scope Definition:

Upsize Pipes at SW Campus Dr. West of 9th Ave SW

Cost Estimate:

City of Federal Way, Public Works: Capital Project

Project Scope Definition

Upsize Pipes at SW Campus Drive West of 9th Ave SW

Authorized Funding

SWM CIP		\$	30,000
TOTAL PROJECT FUNDING		\$	30,000

Estimated Construction Cost

\$ 22,026

Other Construction Cost

Construction Management	8%	\$	2,000	
Construction Administration	10%	\$	2,000	
Construction Inspection	10%	\$	2,000	
Construction Contingency	10%	\$	2,000	
				\$ 8,000

Total Project Cost

\$ 30,000

Project Scope Definition:

Upsize Pipes at SW Campus Dr. West of 9th Ave SW

Project Strategy:

Professional Design Services:

To be filled out by City.

Construction:

To be filled out by City.

Issues and Concerns:

ADA:

Historic and/or Cultural Preservation:

Operations and Maintenance:

Program Delivery:

Due to the recent HMA overlay, this project should minimize impact to the roadway surface.

Sustainability:

Post Construction Maintenance:

Communications and Public Outreach:

Signage Considerations:

Right-of-Way/Access:

This project is located in the ROW.

Project Scope Definition:

Upsize Pipes at SW Campus Dr. West of 9th Ave SW

Permit and Regulatory Considerations:

Project Schedule:

Start Date:

Key Milestones:

Project Completion Date:

Project Constraints and Uncertainties:

- Pipe material should be confirmed for pipe bursting techniques. Pipe bursting is not feasible for CMP. Concrete pipe is feasible if it is reinforced with wire mesh. If it is reinforced with steel bars, than pipe bursting would be much more difficult.

END

City of Federal Way
Public Works: Capital Projects
Project Scope Definition

Project: West Hylebos Basin Land Acquisition

Location: Creek corridors between S 356th St and S 373rd St.

Basin: West Hylebos

Date:

Priority Score: 52

Program Funding Components:

SWM CIP (304-3100-XXX)

\$2,378,000

TOTAL FUNDS ASSIGNED TO THIS PROJECT:

\$0

Responsible Program Manager: Program Manager

Responsible Project Manager/ Project Engineer: Project Manager

Problem Description:

Project Solution:

This project will purchase properties along West Hylebos Creek and North Fork West Hylebos Creek corridors between S 356th St and S 373rd St. The purpose of the project is to protect the creek and its riparian zone. Some of the parcels have already been acquired by the city. A few parcels are owned by other public agencies such as Lakehaven Utility District or WSDOT. The goal of this project includes acquiring five parcels along the corridor that are currently owned by private owners.

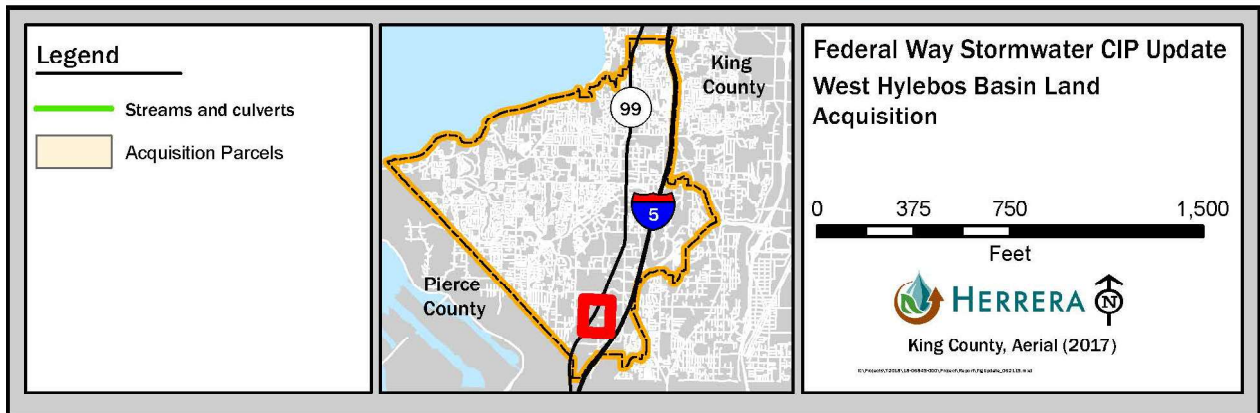
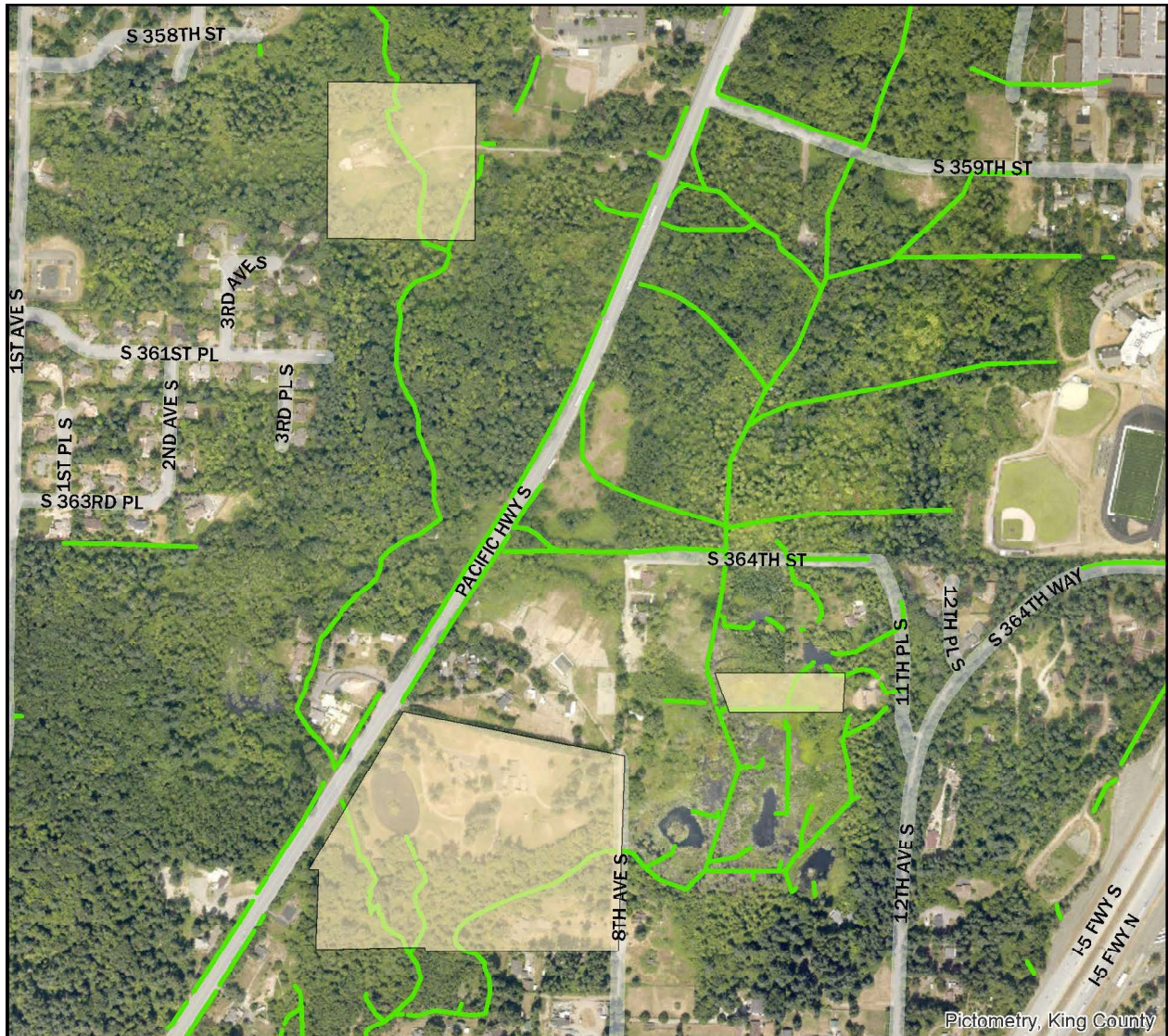
Cost Estimate Assumptions:

The total 2018 assessed value of the five parcels is approximately \$2,378,000. The city plans to set aside \$150,000 per year for the acquisition of these parcels.

Project Scope Definition:

West Hylebos Basin Land Acquisition

Vicinity Map:



Project Scope Definition:

West Hylebos Basin Land Acquisition

Cost Estimate:

**NO IMAGE
AVAILABLE**

Project Scope Definition:

West Hylebos Basin Land Acquisition

Project Strategy:

Professional Design Services:

To be filled out by City.

Construction:

To be filled out by City.

Issues and Concerns:

ADA:

Historic and/or Cultural Preservation:

Operations and Maintenance:

Program Delivery:

Sustainability:

Post Construction Maintenance:

Communications and Public Outreach:

Signage Considerations:

Right-of-Way/Access:

Project Scope Definition:

West Hylebos Basin Land Acquisition

Permit and Regulatory Considerations:

Project Schedule:

Start Date:

Key Milestones:

Project Completion Date:

Project Constraints and Uncertainties:

- Additional funding sources remain uncertain. There is already \$1M in the City Fund 304 allocated towards this project. There is a potential for matching funds from King County.

END

City of Federal Way
Public Works: Capital Projects
Project Scope Definition

Project: West Hylebos Educational Center Site Improvements

Location: Brook Lake Community Center

Basin: West Hylebos

Date:

Priority Score: 46

Program Funding Components:

SWM CIP (304-3100-XXX)

\$1,700,000

TOTAL FUNDS ASSIGNED TO THIS PROJECT:

\$0

Responsible Program Manager: Program Manager

Responsible Project Manager/ Project Engineer: Project Manager

Problem Description:

Project Solution:

This project will convert a portion of the Brook Lake Community center site into an education and outreach center focused on stormwater education and environmental stewardship. The site will provide a trailhead location for the expansion of the Hylebos Wetlands Park Trail to the south. This will be a joint project between Surface Water Management and the Parks Department. Both the scope and timing of the project will be highly dependent on grant funding sources.

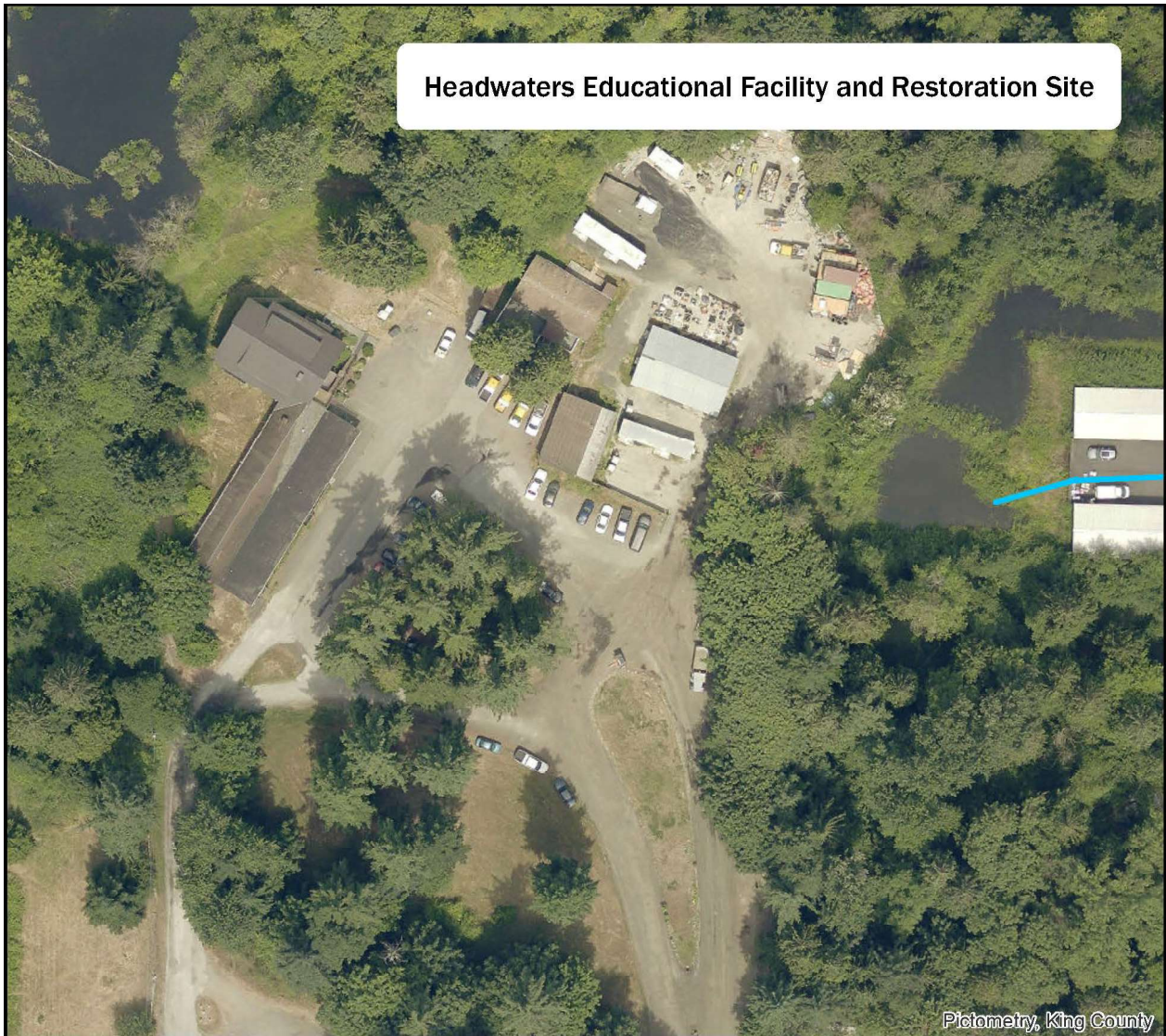
Cost Estimate Assumptions:




The itemized cost estimate includes design and constructed improvements to the building including the entrance, driveway, and educational displays.

Project Scope Definition:

West Hylebos Educational Center Site Improvements

Vicinity Map:



<p>Legend</p> <p>Existing features</p> <p> Stormwater pipe</p>		<p>Federal Way Stormwater CIP Update</p> <p>West Hylebos Educational Center Site Improvements</p> <p>0 50 100 200</p> <p>Feet</p>  <p>King County, Aerial (2017)</p>
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Project Scope Definition:

West Hylebos Educational Center Site Improvements

Cost Estimate:

City of Federal Way, Public Works: Capital Project
Project Scope Definition

West Hylebos Educational Center Site Improvements

Authorized Funding		
SWM CIP		\$ 1,700,000
TOTAL PROJECT FUNDING		\$ 1,700,000
Estimated Construction Cost	\$ 1,231,880	
Design Cost		
Site Survey	\$ 45,000	
Project Design	\$ 60,000	
		\$ 105,000
Other Construction Cost		
Construction Administration	10% \$ 120,000	
Construction Inspection	10% \$ 120,000	
Construction Contingency	10% \$ 120,000	
		\$ 360,000
Total Project Cost		\$ 1,700,000

Project Scope Definition:

West Hylebos Educational Center Site Improvements

Project Strategy:

Professional Design Services:

To be filled out by City.

Construction:

To be filled out by City.

Issues and Concerns:

ADA:

Historic and/or Cultural Preservation:

Operations and Maintenance:

Program Delivery:

Sustainability:

Post Construction Maintenance:

Communications and Public Outreach:

Signage Considerations:

Right-of-Way/Access:

Project Scope Definition:

West Hylebos Educational Center Site Improvements

Permit and Regulatory Considerations:

Project Schedule:

Start Date:

Key Milestones:

Project Completion Date:

Project Constraints and Uncertainties:

- The project scope and timing will be highly dependent on grant funding sources.
- The City is considering taking out a loan for part of this project to ensure adequate funding by 2026.

END

City of Federal Way
Public Works: Capital Projects
Project Scope Definition

Project: North Fork West Hylebos Watershed Trail

Location: North Fork West Hylebos Watershed

Basin: West Hylebos

Date:

Priority Score: 31

Program Funding Components:

SWM CIP (304-3100-XXX)

\$5,200,000

TOTAL FUNDS ASSIGNED TO THIS PROJECT:

\$0

Responsible Program Manager: Program Manager

Responsible Project Manager/ Project Engineer: Project Manager

Problem Description:

Project Solution:

This project will create a nature trail system within the Spring Valley along North Fork West Hylebos Creek. One leg of the trail system will be extended to the nearby Todd Beamer High School. The trail will better connect the community with the natural environment, provide numerous education and outreach opportunities and encourage environmental stewardship. This project would be a joint venture between SWM and the Parks Department. The scope and timing of the project will be highly dependent upon grant funding success

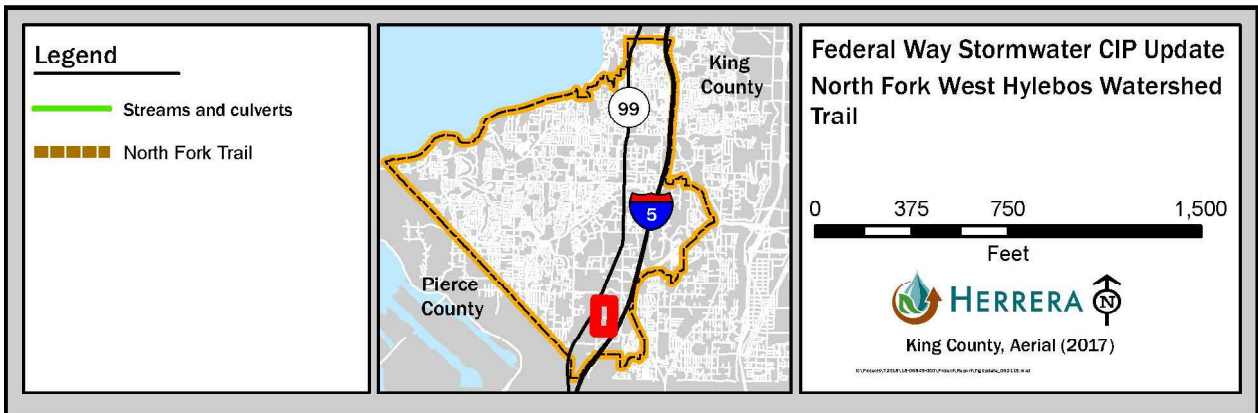
Cost Estimate Assumptions:

Funding for this project includes design and construction of the trail.

Project Scope Definition:

North Fork West Hylebos Watershed Trail

Vicinity Map:



Project Scope Definition:

North Fork West Hylebos Watershed Trail

Cost Estimate:

City of Federal Way, Public Works: Capital Project
Project Scope Definition

North Fork West Hylebos Watershed Trail

Authorized Funding

SWM CIP		\$ 2,600,000
Expected Grant Funding		\$ 2,600,000
TOTAL PROJECT FUNDING		\$ 5,200,000

Estimated Construction Cost \$ 3,678,600

Design Cost

Project Design	\$ 147,144	
		\$ 147,144

Other Construction Cost

Construction Management	8%	\$ 290,000	
Construction Administration	10%	\$ 370,000	
Construction Inspection	10%	\$ 370,000	
Construction Contingency	10%	\$ 370,000	
			\$ 1,400,000

Total Project Cost \$ 5,200,000

Project Scope Definition:

North Fork West Hylebos Watershed Trail

Project Strategy:

Professional Design Services:

Construction:

Issues and Concerns:

ADA:

Historic and/or Cultural Preservation:

Operations and Maintenance:

Program Delivery:

The scope and timing of the project will be highly dependent upon grant funding success.

Sustainability:

Post Construction Maintenance:

Communications and Public Outreach:

Signage Considerations:

Signage along the trail will provide opportunities for public education.

Right-of-Way/Access:

Project Scope Definition:

North Fork West Hylebos Watershed Trail

Permit and Regulatory Considerations:

Project Schedule:

Start Date:

Key Milestones:

Project Completion Date:

Project Constraints and Uncertainties:

- The scope and timing of the project will be highly dependent upon grant funding success

END

City of Federal Way
Public Works: Capital Projects
Project Scope Definition

Project: West Hylebos Watershed Trail

Location: Lower West Branch Hylebos Watershed

Basin: West Hylebos

Date:

Priority Score: 31

Program Funding Components:

SWM CIP (304-3100-XXX)

\$7,800,000

TOTAL FUNDS ASSIGNED TO THIS PROJECT:

\$0

Responsible Program Manager: Program Manager

Responsible Project Manager/ Project Engineer: Project Manager

Problem Description:

Project Solution:

This project will create a nature trail system within the Lower West Branch Hylebos conservation areas to expand on the existing West Hylebos Wetland Park trails. The trails will better connect the community with the natural environment, provide numerous education and outreach opportunities and encourage environmental stewardship. This project would be a joint venture between SWM and the Parks Department. The scope and timing of the project will be highly dependent upon grant funding success.

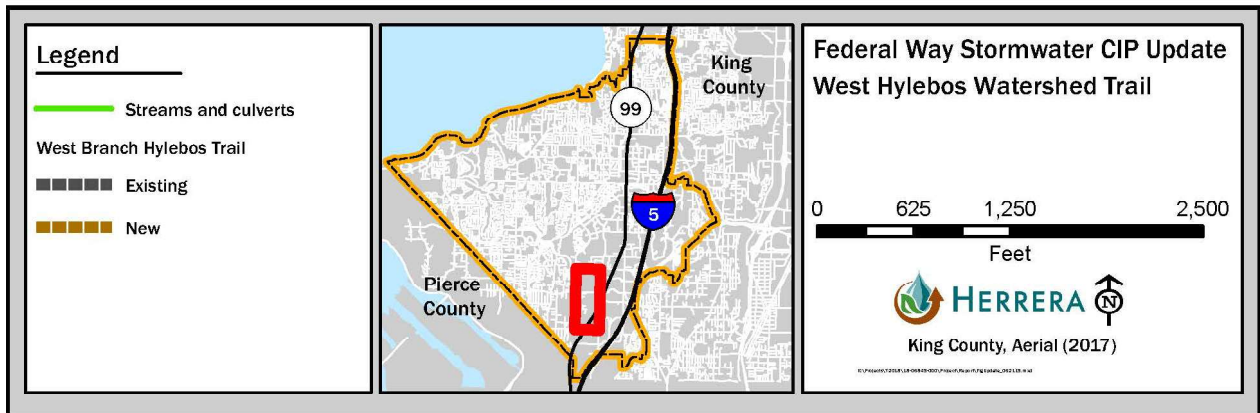
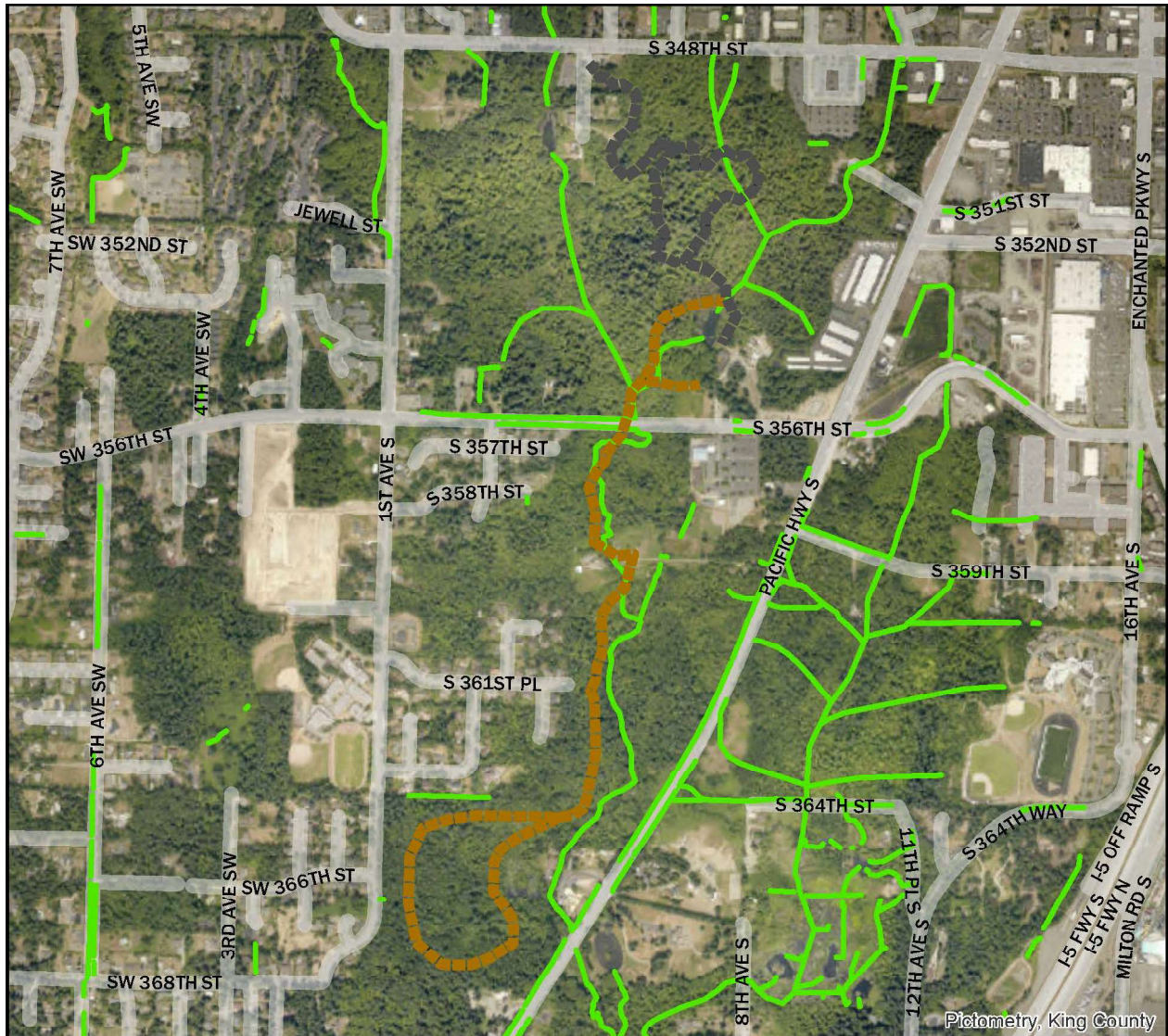
Cost Estimate Assumptions:

Funding for this project includes design and construction of the trail.

Project Scope Definition:

West Hylebos Watershed Trail

Vicinity Map:



Project Scope Definition:

West Hylebos Watershed Trail

Cost Estimate:

**City of Federal Way, Public Works: Capital Project
Project Scope Definition**

West Hylebos Watershed Trail

Authorized Funding

SWM CIP		\$ 3,900,000
Expected Grant Funding		\$ 3,900,000
TOTAL PROJECT FUNDING		\$ 7,800,000

Estimated Construction Cost \$ 5,502,000

Design Cost

Project Design	\$ 220,080	
		\$ 220,080

Other Construction Cost

Construction Management	8%	\$ 440,000	
Construction Administration	10%	\$ 550,000	
Construction Inspection	10%	\$ 550,000	
Construction Contingency	10%	\$ 550,000	
			\$ 2,090,000

Total Project Cost \$ 7,800,000

Project Scope Definition:

West Hylebos Watershed Trail

Project Strategy:

Professional Design Services:

Construction:

Issues and Concerns:

ADA:

Historic and/or Cultural Preservation:

Operations and Maintenance:

Program Delivery:

The scope and timing of the project will be highly dependent upon grant funding success.

Sustainability:

Post Construction Maintenance:

Communications and Public Outreach:

Signage Considerations:

Signage along the trail will provide opportunities for public education.

Right-of-Way/Access:

Project Scope Definition:

West Hylebos Watershed Trail

Permit and Regulatory Considerations:

Project Schedule:

Start Date:

Key Milestones:

Project Completion Date:

Project Constraints and Uncertainties:

- The project scope and timing will be highly dependent on grant funding sources.

END

City of Federal Way
Public Works: Capital Projects
Project Scope Definition

Project: Citywide Water Quality Monitoring

Location: Citywide

Basin: N/A

Date:

Priority Score: 27

Program Funding Components:

SWM CIP (304-3100-XXX)

\$100,000

TOTAL FUNDS ASSIGNED TO THIS PROJECT:

\$0

Responsible Program Manager: Program Manager

Responsible Project Manager/ Project Engineer: Project Manager

Problem Description:

There are five freshwater streams within the City of Federal Way that are designated as Category 5 on the 303(d) list or that have suspected water quality issues: Hylebos Creek (West and East Forks), Redondo Creek, Cold Creek, Joes Creek, and Lakota Creek. Suspected water quality concerns not listed on the 303(d) list include sediment transport concerns in Hylebos Creek, Lakota Creek, Cold Creek, and Redondo Creek. Pursuant to the standards set forth under the Clean Water Act, the city is required to make all known, available, and reasonable efforts to return these waters to their beneficial use. In order to achieve this, water quality monitoring data must be collected to inform source identification for pollutants and determine a course of action for water quality improvement.

Project Solution:

The goal of this project is to establish continuous water quality monitoring data for streams in Federal Way. First, the City will analyze existing water quality data and past water quality monitoring projects to determine parameters to monitoring in each stream and potential monitoring methods. Parameters monitored may vary by stream. Next, the City will develop a monitoring plan for all streams including a Quality Assurance Project Plan (QAPP), identification of monitoring locations within the 5 streams, and development of a monitoring schedule.

The eventual monitoring plan may include the following: water quality monitoring equipment; 5 to 15 monitoring sites with or without installed permanent equipment; staff time to maintain equipment, collect grab samples, and analyze data; and laboratory costs to analyze data.

Cost Estimate Assumptions:

A cost estimate of \$100,000 per year was assumed based on consultant experience with similar water quality monitoring projects. Identification of parameters, selection of monitoring sites, and definition of the monitoring plan will better inform annual costs.

Vicinity Map:

**NO IMAGE
AVAILABLE**

Project Scope Definition:

Citywide Water Quality Monitoring

Cost Estimate:

**NO IMAGE
AVAILABLE**

Project Scope Definition:

Citywide Water Quality Monitoring

Project Strategy:

Professional Design Services:

Construction:

Issues and Concerns:

ADA:

Historic and/or Cultural Preservation:

Operations and Maintenance:

Program Delivery:

Sustainability:

Post Construction Maintenance:

Communications and Public Outreach:

Signage Considerations:

Right-of-Way/Access:

Project Scope Definition:

Citywide Water Quality Monitoring

Permit and Regulatory Considerations:

Project Schedule:

Start Date:

Key Milestones:

Project Completion Date:

Project Constraints and Uncertainties:

- Monitoring activities are assumed to be done by City staff. In the event that City staff are not available, the City will utilize Stream Teams or hire King County staff to implement monitoring.

END