HERRERA

TECHNICAL MEMORANDUM

Date: June 28, 2022

To: Stella Collier, City of Bainbridge Island

From: Mindy Fohn and Katie Wingrove, Herrera Environmental Consultants, Inc.

Subject: City of Bainbridge Island—Watershed Prioritization

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BACKGROUND

The purpose of this technical memorandum is to document the watershed prioritization process used for the City of Bainbridge Island (City) to meet the requirements of S5.C.1.d.ii of the 2019–2024 Western Washington Phase II National Pollutant Discharge Elimination System (NPDES) Stormwater Permit (permit). The approach taken to complete this prioritization process generally follows Ecology's Stormwater Management Action Planning Guidance (Ecology 2019) with modifications that reflect City priorities, stakeholder feedback and the unique nature of receiving water uses of the island.

The City submitted their City of Bainbridge Island – Watershed Inventory and Assessment technical memorandum prior to the March 31, 2022, permit deadline. The submittal included both an inventory of watershed attributes and a preliminary evaluation of watersheds for City stormwater influence (Herrera 2022a).

The intent of this prioritization is to select one highest priority watershed and catchment for future development of a Stormwater Management Action Plan (SMAP) Implementation Plan.

Prioritization was conducted in five steps; Figure 1 depicts each step.

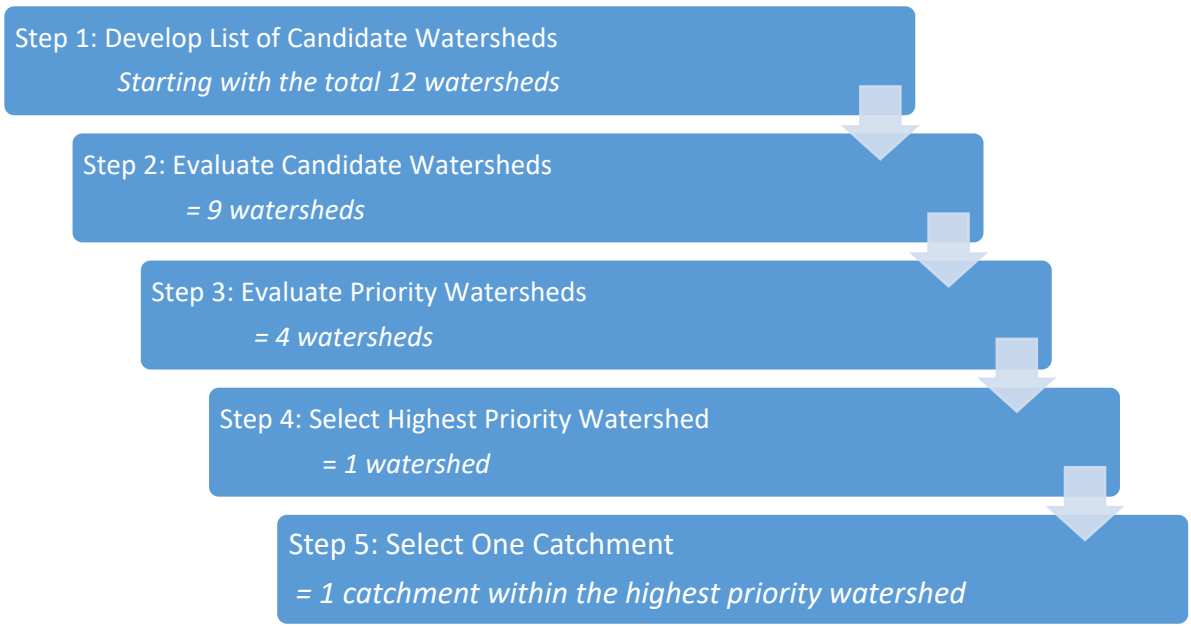


Figure 1. Watershed Prioritization Process Steps for the City of Bainbridge Island.

Step 1: Develop List of Candidate Watersheds

The City of Bainbridge Island – Watershed Inventory and Assessment technical memorandum (Herrera 2022a) identifies 12 watersheds. In the technical memorandum, an analysis of receiving water conditions, aquatic resources and stormwater contributions concluded that the following

three watersheds be removed from further prioritization: Agate Pass, Gazzam Lake and South Beach. The remaining nine watersheds are listed in Figure 2 and depicted spatially in Figure 3.

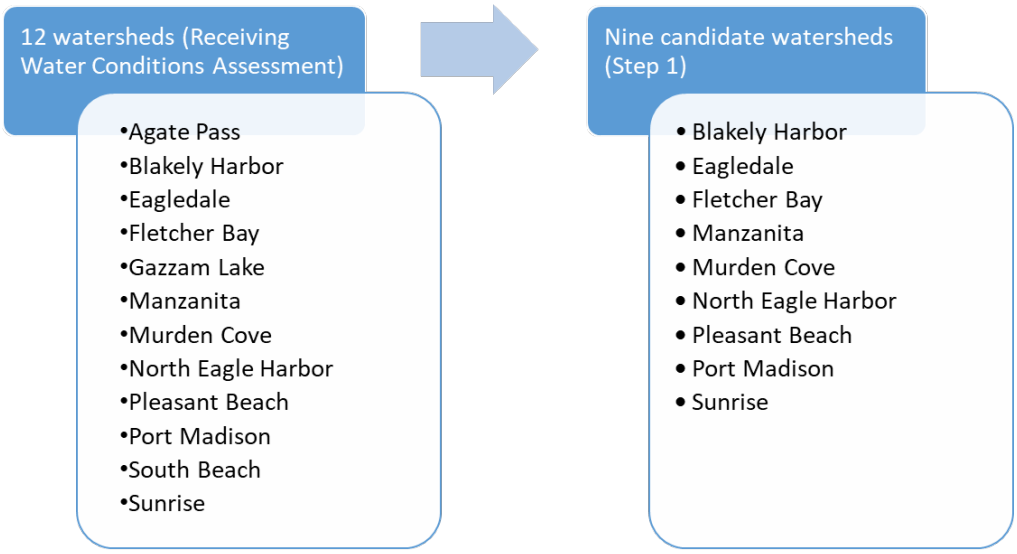
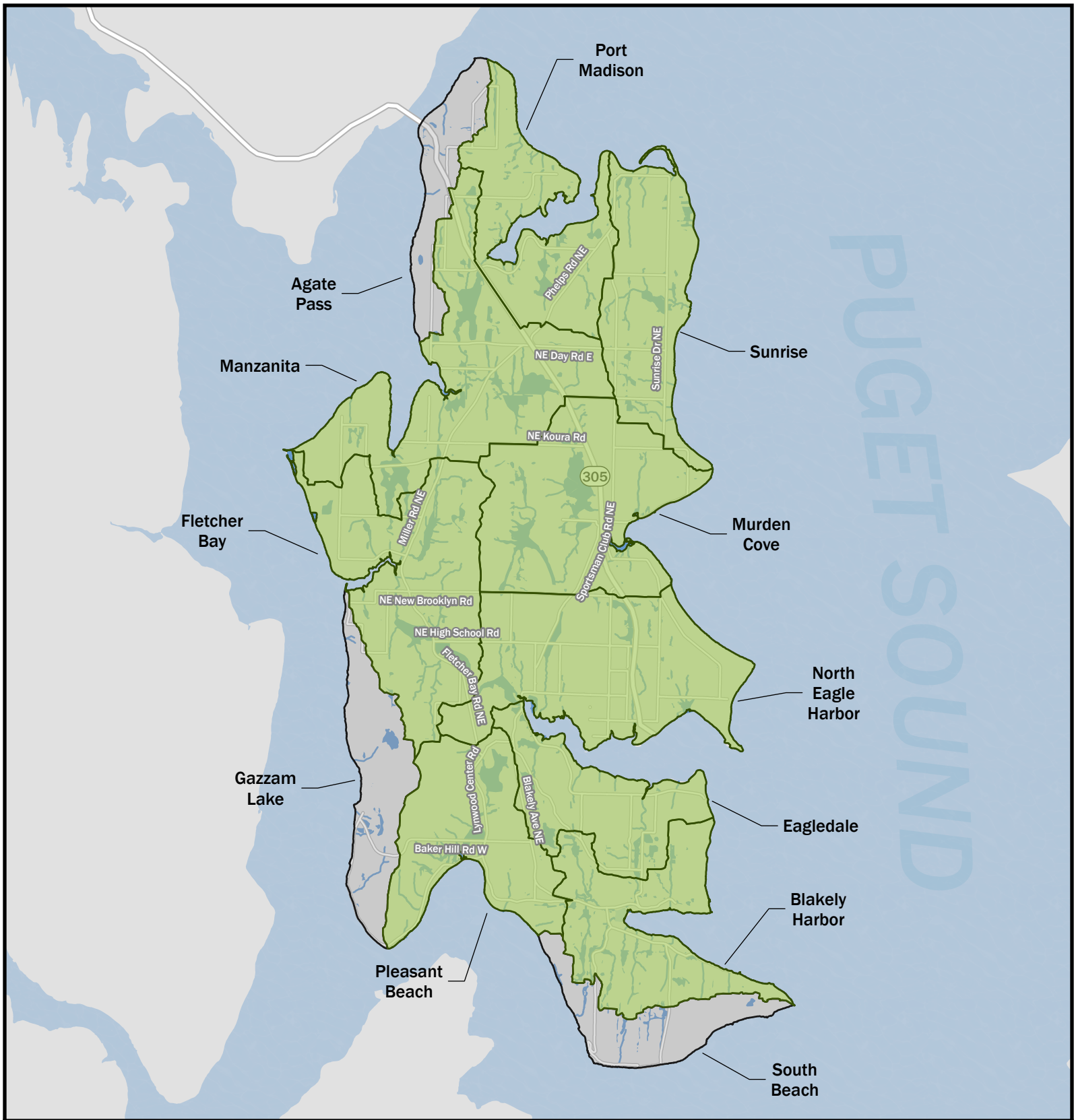


Figure 2. Candidate Watersheds Identified During Step 1 of the Prioritization Process for the City of Bainbridge Island.



Legend

- Watersheds
- Candidate Watersheds
- Other Watersheds
- Wetlands and Lakes
- Streams
- Roads

Figure 3.
City of Bainbridge Island Candidate Watersheds for Prioritization.

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0 0.5 1 2 Miles

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Step 2: Evaluate Candidate Watersheds

Next, the nine candidate watersheds were scored and ranked based on three evaluation categories:

- Overall Water Importance
- Development and Future Growth
- Water and Habitat Conditions

Table 1 summarizes each category, its purpose, and the metrics selected to evaluate the category. Metrics were selected with input from City staff, external stakeholders and review of Ecology guidance (Ecology 2019).

The City conducted a workshop March 1, 2022. Workshop attendees included City staff and stakeholders from the community and other agencies highly involved in water resource management and conservation. Attendees provided feedback during and after the workshop identifying metrics most important for prioritization and suggested additional metrics. Feedback was incorporated into this process and influenced metric selection.

Table 1. Description of Evaluation Category, Purpose, and Metrics Used During Step 2 of the Prioritization Process.

Category	Purpose	Metric
Overall Water Importance	Determine the extent the receiving water supports use by aquatic species and the community. Higher scores denote a greater number of species, habitat presence and community use.	• Freshwater use by salmonid species • Nearshore marine use by forage fish • Nearshore marine use for shellfishing • Water flow importance
Development and Future Growth	Determine the extent of land development and potential future development. Higher scores denote a higher level of development and future development.	• Percent total impervious area • Area developed prior to higher level of flow control requirements • Vacant buildable lands • Future growth impacting shallow groundwater supply
Water and Habitat Conditions	Determine existing level of impairment of water and habitat conditions. Higher scores denote poorer condition.	• Water quality index • B-IBI[a] • Fish passage barriers • Water flow degradation

[a] B-IBI=Benthic Index of Biotic Integrity

2.1–Overall Water Importance Evaluation

Overall Water Importance was scored for number of salmonid and trout species presence, marine nearshore presence of forage fish, water flow importance and percent shoreline area approved for commercial shellfishing. The scoring method used to evaluate overall water importance is depicted in Table 2. Scoring results and rankings are summarized in Table 3.

Table 2. Scoring Method to Assess Overall Water Importance.

Metric	Scoring
Freshwater Salmon and Trout Species Presence	Watersheds were scored based upon species presence from the Statewide Salmon Distribution Database and NOAA[a] Critical Habitat Mapping for ESA[b] listed species, and Wild Fish Conservancy Stream Typing. ● Score of 0: No species ● Score of 1: One species presence ● Score of 2: Two species presence ● Score of 3: Three more species presence
Forage Fish Nearshore Species Use	Watersheds were scored based upon Washington State Forage Fish Mapping representing habitat potential of the nearshore marine shoreline use by surf smelt and/or herring for spawning.[c.] ● Score of 0: No forage fish use. ● Score of 1: Forage fish use for one species ● Score of 2: Forage fish use for two species ● Score of 3: Forage fish use for three species
Water Flow Importance	Watersheds were scored based upon water flow processes described in the Puget Sound Watershed Characterization Project. ● Score of 0: Low ● Score of 1: Moderate ● Score of 2: Moderate High ● Score of 3: Highest
Percent of Shoreline Area Open to Commercial Shellfish Harvest	Watersheds were scored based upon the WSDOH[c] mapping and percentage of nearshore area classified as *approved* for commercial shellfish harvest. ● Score of 0: No approved commercial shellfish harvest ● Score of 1: 10 percent or less commercial shellfish harvest areas ● Score of 2: Between 11-50 percent commercial shellfish harvest areas ● Score of 3: Greater than 51 percent commercial shellfish harvest areas

[a] National Oceanic and Atmospheric Administration.

[b] Endangered Species Act.

[c] Note: Forage fish spawning data is from 2007. Data was retained as a representation of habitat potential.

[d] Washington State Department of Health.

The highest potential score for Overall Water Importance is 12. Scores for candidate watersheds ranged from 12 to 6 and are compiled in Table 3. Manzanita watershed was the top ranked watershed with the highest Overall Water Importance.

Table 3. Overall Water Importance Scoring and Ranking for the Candidate Watersheds in the City of Bainbridge Island.

	Diversity of Salmonid Species Use		Forage Fish Nearshore Species Use		Water Flow Importance		Percent of Area Open to Commercial Shellfish Harvest		Combined Results	
Watershed	**Species**	**Score**	**Species**	**Score**	**Rating**	**Score**	**Percent**	**Score**	**Total Score**	**Rank**
Manzanita	Coho, resident trout, fall chum	3	Sand lance, surf smelt, herring	3	Highest	3	90%	3	**12**	**1**
Fletcher Bay	Coho, resident trout, fall chum, winter steelhead	3	Sand lance, surf smelt, herring	3	Moderate High	2	90%	3	**11**	**2**
Murden Cove	Coho, resident trout	2	Sand lance, surf smelt	2	Moderate High	2	100%	3	**9**	**3**
Port Madison	Coho, winter steelhead	3	Sand lance, surf smelt, herring	3	Low	0	90%	3	**9**	**3**
Eagledale	Coho	1	Smelt, sand lance	2	Moderate High	2	75%	3	**8**	**5**
Pleasant Beach	Coho, resident trout, fall chum	3	Sand lance, surf smelt	2	Highest	3	0%	0	**8**	**5**
Sunrise	Coho, resident trout	2	Sand lance, surf smelt, herring	3	Low	0	100%	3	**8**	**5**
Blakely Harbor	Coho, resident trout	2	Surf smelt	1	Moderate	1	80%	3	**7**	**8**
North Eagle Harbor	Coho, resident trout, fall chum	3	Surf smelt	1	Moderate	1	10%	1	**6**	**9**

2.2–Development and Future Growth Evaluation

Development and Future Growth was assessed using metrics for watershed percent total impervious area, percent developed area prior to higher level of flow control requirements, percent of area vacant buildable lands, and number of future permit exempt wells impacting shallow groundwater supply.

The scoring method applied to assess Development and Future Growth is depicted in Table 4. Scoring and ranking is summarized in Table 5.

Table 4. Scoring Method Used to Evaluate Development and Future Growth.

Metric	Scoring
Development	
Percent Total Impervious Area	Watersheds were scored based upon total (watershed-wide) impervious area as a measure of the degree to which existing development may be contributing pollutants and flow. ● Score of 0: Less than 5.0 percent impervious area ● Score of 1: 5.1 to 10.0 percent impervious area ● Score of 2: 10.1 to 20.0 percent impervious area ● Score of 3: 20.1 percent and greater impervious area
Area Developed Prior to Higher Level of Flow Control Requirements	Watersheds were scored based upon the percentage of the developed area prior to 2007 to a lower standard of stormwater flow control. ● Score of 0: Less than 40 percent ● Score of 1: 41-50 percent ● Score of 2: 51-60 percent ● Score of 3: Greater than 61%
Future Growth	
Vacant Buildable Lands	Watersheds were scored based upon percentage of vacant land available for new development. ● Score of 0: No vacant land ● Score of 1: Less than 5 percent ● Score of 2: 5.1 to 10 percent ● Score of 3: Greater than 10.1 percent
Future Growth Impacting Shallow Groundwater Supply	Watersheds were scored based upon number of projected new permit-exempt wells[a] per square mile that will draw from shallow groundwater and potentially impact stream flows. ● Score of 0: Less than 9 ● Score of 1: 10-19 ● Score of 2: 20-39 ● Score of 3: Greater than 40

[a] Permit exempt wells draw from groundwater aquifers compared to Group A or Group B water system wells. Up to 2 residences may use one permit exempt well, and these wells are located in areas not accessible to a Group A or Group B water system. The greater number of permit exempt wells results in potential reduction of stream flows in the watershed.

The highest potential score for Development and Future Growth is 12. Scores for candidate watersheds ranged from 9 to 4 (Table 5). Five watersheds scored 9. The total scores were primarily derived by existing development as measured by percent impervious surface or future growth as measured by percent vacant lands and percent permit exempt wells per area.

Table 5. Development and Future Growth Scoring and Ranking for the Candidate Watersheds in the City of Bainbridge Island.

	Percent Impervious Surface		Percent of Development prior to Higher Level of Flow Control Requirements		Percent Vacant Buildable Lands		Number of Potential Permit Exempt Wells Per Square Mile		Combined Results	
Watershed	**%TIA[a]**	**Score**	**% Area**	**Score**	**% Vacant Land**	**Score**	**Number**	**Score**	**Total Score**	**Rank**
Eagledale	9.7	1	61	3	9	2	63	3	**9**	**1**
Fletcher Bay	6.8	1	57	2	12	3	44	3	**9**	**1**
Manzanita	8.9	1	55	2	10	3	45	3	**9**	**1**
Murden Cove	10.1	2	53	2	6	2	41	3	**9**	**1**
North Eagle Harbor	21.3	3	51	2	8	2	20	2	**9**	**1**
Port Madison	7.4	1	55	2	14	3	84	3	**9**	**1**
Sunrise	10.6	2	66	3	9	2	z	1	**8**	**7**
Pleasant Beach	10.3	2	52	2	9	2	12	1	**7**	**8**
Blakely Harbor	6.2	1	37	0	23	3	7	0	**4**	**9**

[a] %TIA=percent impervious surface

2.3–Water and Habitat Condition Evaluation

Water and Habitat Condition was evaluated based on the water quality index, Benthic Index of Biotic Integrity (B-IBI), water flow degradation and the number of known complete fish passage barriers.

The scoring method for Water and Habitat Condition is depicted in Table 6. Scoring results and rankings are summarized in Table 7.

Table 6. Scoring Method Used to Evaluate Water and Habitat Condition.

Metric	Scoring
Water Quality Index	Watersheds were scored based upon stream water quality index as measured by the City. For watersheds with multiple streams, scores were averaged. ● Score of 1: Excellent ● Score of 2: Moderate ● Score of 3: Poor
B-IBI	Watersheds were scored based upon the most recent B-IBI scores. No data was available for Pleasant Beach, Blakely Harbor, Sunrise, and Port Madison. Scores from a watershed with similar percent impervious surface was applied to these watersheds. ● Score of 0: Good ● Score of 1: Fair ● Score of 2: Poor ● Score of 3: Very Poor
Water Flow Degradation	Watersheds were scored using the Ecology's Puget Sound Watershed Characterization analysis, refined for Bainbridge Island ● Score of 0: Low ● Score of 1: Moderate ● Score of 2: Moderate High ● Score of 3: Highest
Full Fish Passage Barriers in Watershed	Watersheds were scored based upon the number of full fish passage barriers. ● Score of 0: 0 fish passage barriers ● Score of 1: 1 to 5 fish passage barriers ● Score of 2: 6 to 10 fish passage barriers ● Score of 3: Greater than 10 fish passage barriers

The highest potential score for Water and Habitat Condition is 12. Scores for candidate watersheds ranged in score from 11 to 3 (Table 7). North Eagle Harbor and Eagledale scored highest indicating higher levels of degradation with poorer water quality and habitat conditions in these watersheds.

Table 7. Water and Habitat Condition Assessment Scoring and Ranking for the Candidate Watersheds in the City of Bainbridge Island.

	Water Quality Index		B-IBI		Water Flow Degradation		Fish Passage Barriers		Combined Results	
Receiving Waters	**Rating**	**Score**	**Rating**	**Score**	**Rating**	**Score**	**Number**	**Score**	**Total Score**	**Rank**
North Eagle Harbor	Moderate	2	Poor	2	Highest	3	15	3	**11**	**1**
Eagledale	Moderate	2	Poor	2	Moderate High	2	11	3	**10**	**2**
Manzanita	Moderate	2	Fair	1	Moderate High	2	28	3	**8**	**3**
Murden Cove	Moderate	2	Fair	1	Moderate High	2	23	3	**8**	**3**
Pleasant Beach	Poor	3	Fair[a]	1	Highest	3	4	1	**8**	**3**
Fletcher Bay	Moderate	2	Fair[a]	1	Moderate	1	17	3	**7**	**6**
Blakely Harbor	Moderate	2	Fair[b]	1	Low	0	10	3	**6**	**7**
Sunrise	Moderate	2	Fair[a]	1	Moderate	1	5	1	**5**	**8**
Port Madison	Moderate	2	Fair[b]	1	Low	0	3	1	**4**	**9**

[a] No data were available for Pleasant Beach and Sunrise watersheds. The B-IBI score from Murden Cove, a watershed with similar impervious surface percentage (10%), was substituted.

[b] No data were available for Blakely Harbor and Port Madison watersheds. The B-IBI score from Fletcher Bay, a watershed with similar impervious surface percentage (7%), was substituted.

2.4–Watershed Management Matrix

The candidate watershed summary evaluation scores and subsequent ratings of the three evaluation categories: Overall Water Importance, Development and Future Growth, and Water and Habitat Condition are displayed in Table 8.

Table 8. Summary of Evaluation Scoring and Ranking Results for the Candidate Watersheds in the City of Bainbridge Island.

Watershed	Overall Water Importance (Table 3)		Development and Growth (Table 5)		Water and Habitat Conditions (Table 7)	
	Total Score	Rating[a]	Total Score	Rating[b]	Total Score	Rating[c]
Blakely Harbor	7	Moderate	4	Low	6	Moderate
Eagledale	8	Moderate	9	High	10	Low
Fletcher Bay	11	High	9	High	7	Moderate
Manzanita	12	High	9	High	8	Moderate
Murden Cove	9	High	9	High	8	Moderate
North Eagle Harbor	6	Moderate	9	High	11	Low
Pleasant Beach	8	Moderate	7	Moderate	8	Moderate
Port Madison	9	High	9	High	4	High
Sunrise	8	Moderate	8	Moderate	5	Moderate

[a] Highest score achievable is 12. Ratings are High = Scores 9–12; Moderate = Scores5–8; Low = Scores 0–4.

[b] Highest score achievable is 12. Ratings are High = Scores 9–12; Moderate = Scores5–8; Low = Scores 0–4.

[c] Highest score achievable is 12. Ratings are High = Scores 0–4; Moderate = Scored 5–8; Low = Scores 9–12.

The ratings allows for each candidate watershed to be placed into one of four broad management matrix categories: *Protection*, *Restoration*, *Conservation*, *Development*, based on Watershed Management Matrix framework for watershed prioritization and management strategies from Washington Department of Commerce (Commerce 2016) and Ecology Puget Sound Watershed Characterization Project (Ecology 2016).

The Watershed Management Matrix y-axis indicates "Level of Importance" from lowest to highest and the x-axis indicates "Level of Degradation" from lowest to highest. For this analysis "Level of Importance" is translated to greater receiving water use support and moderate to good conditions, and "Level of Degradation" is translated to the level of watershed development and growth. The above framework does not incorporate water and habitat conditions; however, the results developed in this analysis are included to better understand receiving water conditions (Table 9).

The most intensive management strategy of *Restoration* applies to watersheds judged most important to restoring water-resource functions but that also have experienced the greatest degradation. Conversely, areas of low importance but also low degradation should require a much lower level of management strategy of *Conservation*. Watersheds with high importance

and low existing degradation may need little or no active intervention (other than appropriate zoning or protective easements) to maintain their high functional conditions and fall under the *Protection* management strategy. Watersheds with low importance and significant existing human impact are in the *Development* management strategy giving way to continued population pressures. Washington Department of Ecology indicate that watersheds that fall into the *Protection* and *Restoration* categories are expected to rank as higher priority.

One of the primary goals in Stormwater Management Action Planning is to identify opportunities for existing stormwater facility retrofits to improve stormwater flow control and treatment. *Restoration* watersheds are optimum candidates for stormwater facility retrofits and additional stormwater management actions due to higher receiving water use support. However, stormwater facility retrofits should not be ruled out in *Development* watersheds as they can provide environmental benefits when opportunities are available.

Table 9 displays the ratings and Watershed Management Matrix category for the candidate watershed.

Table 9. Watershed Management Goals and Retrofit Strategy Results for Candidate Watersheds in the City of Bainbridge Island.

Watershed	Water Importance	Water and Habitat Conditions	Development and Growth	Management Matrix Category
Blakely Harbor	Moderate	Moderate	Low	Conservation
Eagledale	Moderate	Low	High	Development
Fletcher Bay	High	Moderate	High	Restoration
Manzanita	High	Moderate	High	Restoration
Murden Cove	High	Moderate	High	Restoration
North Eagle Harbor	Moderate	Low	High	Development
Pleasant Beach	Moderate	Moderate	Moderate	Development
Port Madison	High	High	High	Restoration
Sunrise	Moderate	Moderate	Moderate	Development

Note: Color indicates the watershed management matrix as shown in Figure 4.

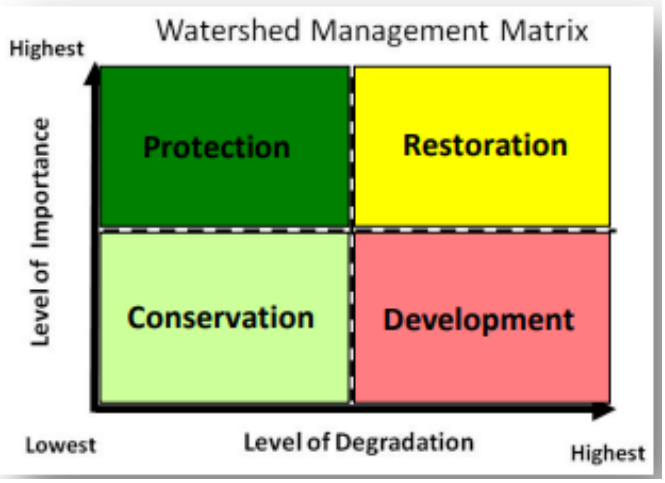


Figure 4. Watershed Management Matrix.

The four watersheds that landed in the *Restoration* category were carried forward to prioritization Step 3 (Figure 5).

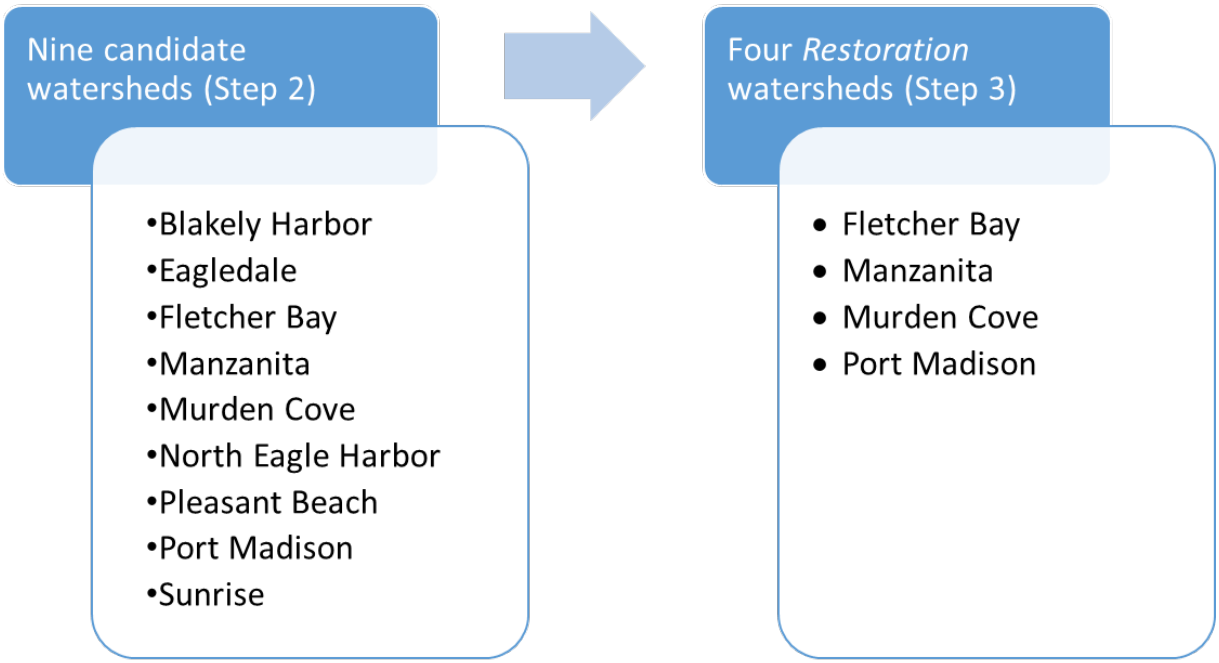


Figure 5. Restoration Watersheds Identified During Step 2 of the Prioritization Process for the City of Bainbridge Island.

Step 3: Evaluate Priority Watersheds

The four restoration watersheds of Fletcher Bay, Manzanita, Murden Cove, and Port Madison were evaluated for:

- Social equity and environmental justice
- Supplemental monitoring data
- Promotes other plans and projects
- Stakeholder feedback

3.1–Social Equity

Characteristics of human populations in the watersheds were evaluated to identify if there exists the potential to benefit overburdened communities by addressing stormwater issues.. Equity metrics were calculated using data from the Washington Environmental Health Disparities Map and database and the Kitsap Overburdened Communities Assessment. Scores for socioeconomic factors and sensitive populations are shown and identify level of vulnerable populations. Table 10 is summary information of selected equity metrics.

Table 10. Social Equity Ranking for City of Bainbridge Island Priority Watersheds.

Watershed	Socioeconomic Factors	Sensitive Populations
Fletcher Bay	1.00	1.43
Manzanita	1.00	1.00
Murden Cove	1.00	1.00
Port Madison	1.00	1.00

Scores are ranked from 0 to 10 (low to high), where higher the rank the greater the burden. Social equity scores for the higher priority watersheds show low levels of burden to populations on Bainbridge Island.

3.2–Supplemental Monitoring Data

Marine mussel tissue and freshwater stream sediment data from previous environmental studies were evaluated as the next step in the prioritization. This evaluation focused on concentrations of copper and zinc as indicators of stormwater runoff.

Results from the Puget Sound Stormwater Action Monitoring mussel tissue studies were reviewed. The sites located in Fletcher Bay, Manzanita, Murden Cove, and Port Madison watersheds were in the mid-range of contamination for all sites indicating regionally typical levels of stormwater pollution from nearshore contaminants.

The City previously conducted stream sediment sampling for stormwater contaminants. Sediments from streams within each of the four watersheds have measured metal concentrations well below levels harmful to aquatic life. Streams in the Fletcher Bay and Manzanita watersheds have slighter higher concentrations of copper, and streams in all four watersheds have similar concentrations of zinc. Overall metals contamination was not a differentiating factor between watersheds. Table 11 summarizes metals in mussel tissue and stream sediments for priority watersheds.

Table 11. Metals in Mussel Tissue and Stream Sediments in City of Bainbridge Island Priority Watersheds.

Watershed	Metals in Mussel Tissue[a]	Metals in Stream Sediments mg/Kg
Fletcher Bay	Cu-25th to 75th Zn - 25th to 75th	Cu-23.5 Zn-39.8
Manzanita	Cu-25th to 75th Zn - 25th to 75th	Cu-21.9 Zn-36.7
Murden Cove	Cu-25th to 75th Zn - 25th to 75th	Cu -6.1 Zn - 36.7
Port Madison	Cu-25th to 75th Zn - 25th to 75th	Cu-9.36 Zn-37.7

[a] Percentiles range of result compared to all Puget Sound samples from 2017/18 study for Fletcher Bay, Manzanita and Murden Cove. Percentile ranges of results compared to all Puget Sound samples from 2015/16 study for Port Madison.

3.3–Promotes Other Plans and Projects

The four higher priority watersheds were evaluated for presence of recent studies, plans, and projects. The results are described below.

Fletcher Bay Watershed

- Springbrook Creek Watershed Assessment: The Springbrook Creek Watershed Assessment was completed in 2018. It is a comprehensive inventory of stream and riparian conditions throughout the watershed. The plan identifies five projects: Eddy Culvert and Armor Removal, Bridge Replacement, Fletcher Bay Culvert and Weir Removal and Stream Restoration, Rekow Stream and Riparian Restoration, Nickum Stream and Riparian Restoration, and Upper Springbrook Protection Project.

- City of Bainbridge Island Capital Improvement Projects: One stormwater capital improvement project is identified in the Fletcher Bay watershed: Springbrook Creek Fish Passage.

- Wild Fish Conservancy Water type Assessment and Project Summary: Wild Fish Conservancy completed the third phase of stream typing on Bainbridge Island in 2017. Restoration and protection opportunities were identified and the following were listed

for the Fletcher Bay watershed: Issei Creek Culvert Replacement and Riparian Restoration.

Manzanita Watershed

- Stressor Identification and Recommended Actions for Restoring and Protecting Select Puget Lowland Stream Basins Report: In 2019 King County completed an analysis of Puget Sound streams selecting 14 basins for restoration or protection. Manzanita Creek was selected as a restoration basin. Stormwater management actions related to flow control, treatment and storage were recommended as high importance actions.

- Watershed Restoration and Enhancement Draft Plan – WIRA 15 Kitsap Watershed: The plan identifies projects in the watershed to offset impacts from future permit exempt groundwater wells: Miller Road Infiltration, M&E (Bainbridge Island Native Food Forest) Farm Storage, and residential rain garden and low impact development projects.

- Manzanita Water Flow and Sediment Export Potential Assessment: In 2021 Ecology completed a study identifying subwatershed areas to target for restoration, implying optimum areas for stormwater infiltration projects.

- Manzanita Watershed Planning Project: In 2021 the City was awarded funding to develop preliminary designs for two stormwater retrofit projects (City of Bainbridge Island, 2021). The designs are in progress and expected to be completed January 2023. At this time top project candidates are Fieldstone Lane NE Regional Facility, Bainbridge Island Native Food Forest Regional Facility and Fieldstone Lane Retrofit.

- Wild Fish Conservancy Water type Assessment and Project Summary: One identified project is identified Manzanita Creek Culvert Replacement, Channel Regrade and Riparian Corridor Improvement.

Murden Cove Watershed

- Murden Cove Watershed Nutrient and Bacteria Reduction Project: In 2017 the City completed a study documenting nutrient and bacteria sources and corrections. The study recommends low impact development projects could help with water quality problems.

Port Madison Watershed

- No studies, projects or plans were identified in the Port Madison watershed.

Based upon the number and type of studies and projects identified, Manzanita is the watershed where the most opportunities have been identified.

3.4–Stakeholder Feedback

The City held workshops on March 1, 2022 and May 10, 2022. Attendees included: City staff from Public Works, Planning and Community Development, and Executive , staff from Friends of the Farms, Bainbridge Island Metro Parks and Recreation District, Kitsap Conservation District, Suquamish Tribe, and Bainbridge Island Land Trust, and volunteer Chair of the Sustainable Bainbridge Watershed Council. Following the first workshop, attendees were sent a survey and invited to provide feedback on criteria for watershed and receiving waters assessment and prioritization . At the second workshop, attendees were invited to provide feedback on the prioritization process and draft results. Feedback received was incorporated into this prioritization process and outcome.

Step 4: Select Highest Priority Watershed

Based on the evaluation (Step 3) and stakeholder feedback, Manzanita watershed was selected as the City of Bainbridge Island's highest priority watershed for Stormwater Management Action Planning. The selection was based on the following characteristics:

- Ranked highest for Overall High Water Importance
- Moderate level of existing development
- High level of potential groundwater withdrawal due to anticipated future growth
- Moderate-high rating for water flow degradation
- High level of support with studies, plans and projects targeting stormwater retrofits for stream flow preservation, protection of water flow importance and reducing impacts of future permit exempt wells
- Majority of stakeholder feedback agreed with selection of this watershed

The highest priority watershed was selected following Step 3 as shown in Figure 6.

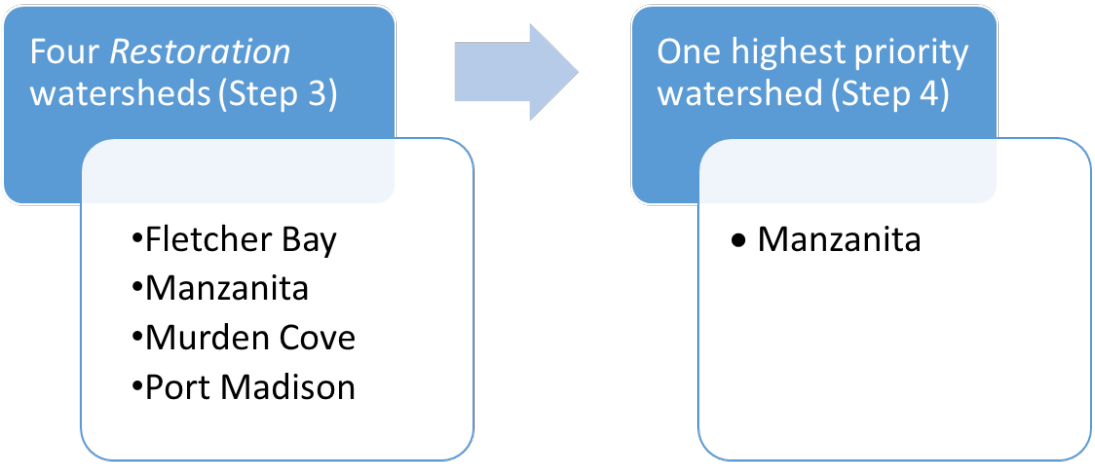
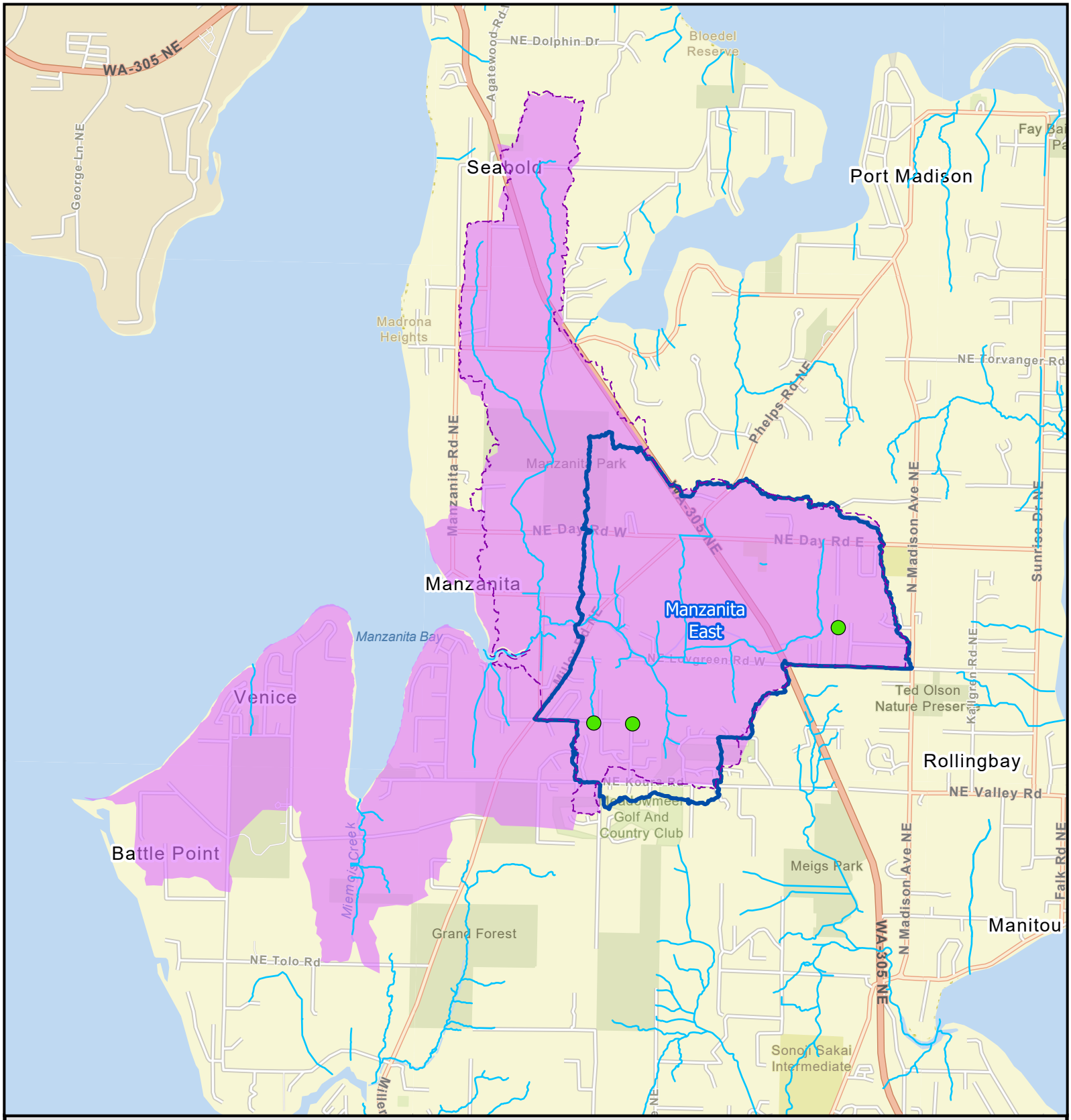


Figure 6. Highest Priority Watershed Identified During Step 3 Analysis of the Prioritization Process for the City of Bainbridge Island.

Step 5: Select Catchment for SMAP Implementation Plan Development

The final step to discover smaller catchments within Manzanita watershed where stormwater facility retrofits might be most beneficial for receiving waters included reviewing study results (Herrera 2022b) identifying optimum infiltration retrofit locations benefitting surface water and groundwater recharge. Figure 7 depicts the selected catchment and preliminary retrofit project locations in the eastern part of Manzanita and north central part of Bainbridge Island.



Legend

- Retrofit Projects
- Binbridge Island Streams
- Manzanita SMAP Catchment
- Manzanita Study Area
- Manzanita Watershed

Note: Minor difference in watershed boundaries due to island-wide versus watershed-specific studies.

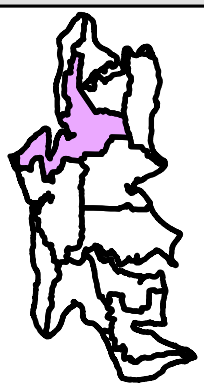


Figure 7. City of Bainbridge Island Priority Watershed and Catchment Area of Manzanita East for Stormwater Management Action Plan (SMAP) Development and Implementation.

N

0 0.25 0.5 1 Miles

HERRERA

ESRI Topography (2022)

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