
UPDATED FINAL

WEST SOUND NEARSHORE INTEGRATION AND SYNTHESIS OF CHINOOK SALMON RECOVERY PRIORITIES



Photo Pre- and Post-Construction of Restoration to Widen Opening to Carpenter Creek Estuary

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1.0 INTRODUCTION

The West Sound Nearshore Integration and Synthesis Project was conducted to identify priority nearshore project areas and opportunities to support the recovery of Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*), which were listed as threatened under the Endangered Species Act in 1999. The project area does not include rivers supporting Chinook spawning, but provides important rearing habitat and migratory corridors for juvenile Chinook from other parts of Puget Sound. A growing body of literature suggests that the early marine growth of juvenile salmon influences their survival rates throughout their entire marine life stages, such that larger juvenile salmon tend to have higher marine survival rates than smaller juvenile salmon (Beamish and Mahnken 2001). Given the role of West Sound habitats in the life cycle of Chinook salmon, the analysis focused on the ecological needs of juvenile Chinook salmon. There is also the assumption that nearshore conditions beneficial for juvenile Chinook are also beneficial for a diverse biological community and the entirety of the ecosystem.

A substantial amount of inventory and assessment work has been conducted in the project area. The purpose of this project was to integrate the existing available information into a science-based prioritization of shoreline areas and specific projects to benefit juvenile Chinook salmon. This prioritization considers multiple types of restoration and protection projects. A focus was given to projects that provide benefits to nearshore processes that form and sustain habitats and prey resources contributing to juvenile Chinook growth and survival. This project addresses the near-term action of the West Central Lead Integrating Organization, to inventory transportation infrastructure projects in the West Sound nearshore (Action ID A1.1 WS1). Specifically, this prioritization aims to synthesize available information to provide a comprehensive interpretation of the priority restoration and protection project opportunities in the nearshore.

1.1 2017 Update

The analysis described in this report was updated in 2017 to improve the user-friendliness of the deliverables, address scoring errors identified in the computational spreadsheet, and add documentation on a scoring sensitivity analysis that was conducted. The following updates were made:

- Excel spreadsheet now includes binning of individual parcels into tiers of priority, as well as projects. The earlier version only included the project tier assignments. The parcel tiers show the relative priority of the restoration/protection action if it can only be completed on that parcel. The same scoring divisions used for projects were applied to the parcels.
- Excel spreadsheet revised to address formula errors in version provided for users. Project scores were correctly calculated and reported, but the original spreadsheet version prepared for general use included some errors.

- Excel spreadsheet addresses scoring errors to the suitability component of a subset of projects. Overall, adjustments were made to the 21 projects of which 17 resulted in project score changes. One error was to the drift cell degradation inputs and resulted in scoring changes to nine projects. Another error was to the Match to Management Strategy for tidal protection projects which resulted in scoring changes to six projects. The Match to Management Strategy was adjusted for one restoration project which resulted in a scoring change. One project score also changed based on an adjustment to the Match to Nearshore Assessment Management Recommendation input.

In addition, two approaches were attempted to revise the Excel spreadsheet formatting to make it easier for users to know what data needs to be entered for each individual project type. One approach explored was a new user interface based on a dichotomous key type-format was considered, and a mock-up was made. However, due to the nature of the parcel-based calculation method for project scores it was found that automation of the score calculation was not possible in this user interface. The second approach entailed revising the Excel spreadsheet so that it included a separate tab for each type of project was also examined. In this way, each tab showed only those fields that need to have data entered or calculated by formula for that project type (all other fields are hidden). Despite its benefits, this approach did not allow for the user to evaluate projects with multiple process types within the same tab. After these investigations, the project team concluded that the original format of the Excel spreadsheet best meets the user's overall needs because of its versatility and ability to protect data integrity. From this exercise, the ultimate takeaway was that the user must invest time to learn the database and become familiar with the User Guide.

In a separate effort, the project team evaluated the sensitivity of the project score formula for projects spanning multiple parcels and found that an alternate project score calculation method would not substantially change project scores. The specific aspect evaluated was how to handle scoring elements credited to some, but not all contributing parcels. In the scoring methods, each parcel was scored separately for each input except overall project size. Then the score of the highest scoring parcel was used as the project score for projects of a single type or used in the calculation of the project score for projects including multiple types of actions. As a result, the project score may not include credit for all aspects of the project area – such as an eelgrass bed in some project parcels, but not the one generating the highest score. There was concern that this project scoring calculation method would lead to scores that underrepresented the projects. The sensitivity analysis examined the changes in project scores when the project score was based on this highest input assigned to any of the project's parcels for each input to the formula. A subset of restoration and protection projects were evaluated and it was found that a substantial scoring change (i.e., >1.5 points) would have occurred for 2% of the projects evaluated. Based on the sensitivity analysis, no changes were made to project scoring rules.

1.2 Project Area

The project area extended from Foulweather Bluff in the north along the entire eastern shoreline of Kitsap County, including Bainbridge Island and Blake Island, and into Pierce County ending just north of Gig Harbor (Figure 1). This encompassed most of the West Central Local Integrating Organization area.

The project opportunities identified and evaluated in the project were within 200 feet of the marine shoreline and in the lowermost 650 feet of creeks. The additional distance in creeks was in consideration of the use of those habitats for rearing by juvenile Chinook originating in other river systems. Beamer et al. (2013) documented the regular occurrence of non-natal juvenile Chinook in the lower 650 feet of creeks throughout the Whidbey Basin portion of Puget Sound. It is likely the fish also went higher into the creeks, but for this study it was decided to limit the project area to the documented distance reported in Beamer et al. (2013).

1.3 Juvenile Chinook in the Nearshore

The project area is not known to contain rivers supporting wild Chinook spawning, but the marine nearshore and lower creek reaches provide rearing habitat for juvenile Chinook originating in other watersheds (e.g., Puyallup River and Green River). Marine nearshore environments provide distinctly different conditions for juvenile salmon than the freshwater portions of the watershed. The fish encounter changes in water salinity, typically cooler water temperatures, new prey items (often larger in size and energy content), the ebb and flow of tides, new habitat configurations, and different predators and competitors. The amount of time outmigrating salmonids spend in the estuary and marine nearshore varies among species, as well as between stocks and even individuals.

Juvenile Chinook are considered the most dependent among salmon species on estuary and marine nearshore rearing habitats (Healey 1982, Fresh 2006). During their early life history, juvenile Chinook tend to remain in close proximity to the Puget Sound shoreline, then move into deeper habitats as they grow larger (Fresh 2006). Their affinity for shallow nearshore habitats is understood to reduce their vulnerability to predation by larger fish and allow them to forage in the productive shallow water habitats. Modifications to estuarine and nearshore habitats have reduced their productivity and impacted juvenile Chinook fitness and survival.

The ecological needs of juvenile salmon in estuaries and the nearshore include:

- foraging and growth,
- avoidance of predators,
- physiological transition, and
- migratory corridor to the ocean.

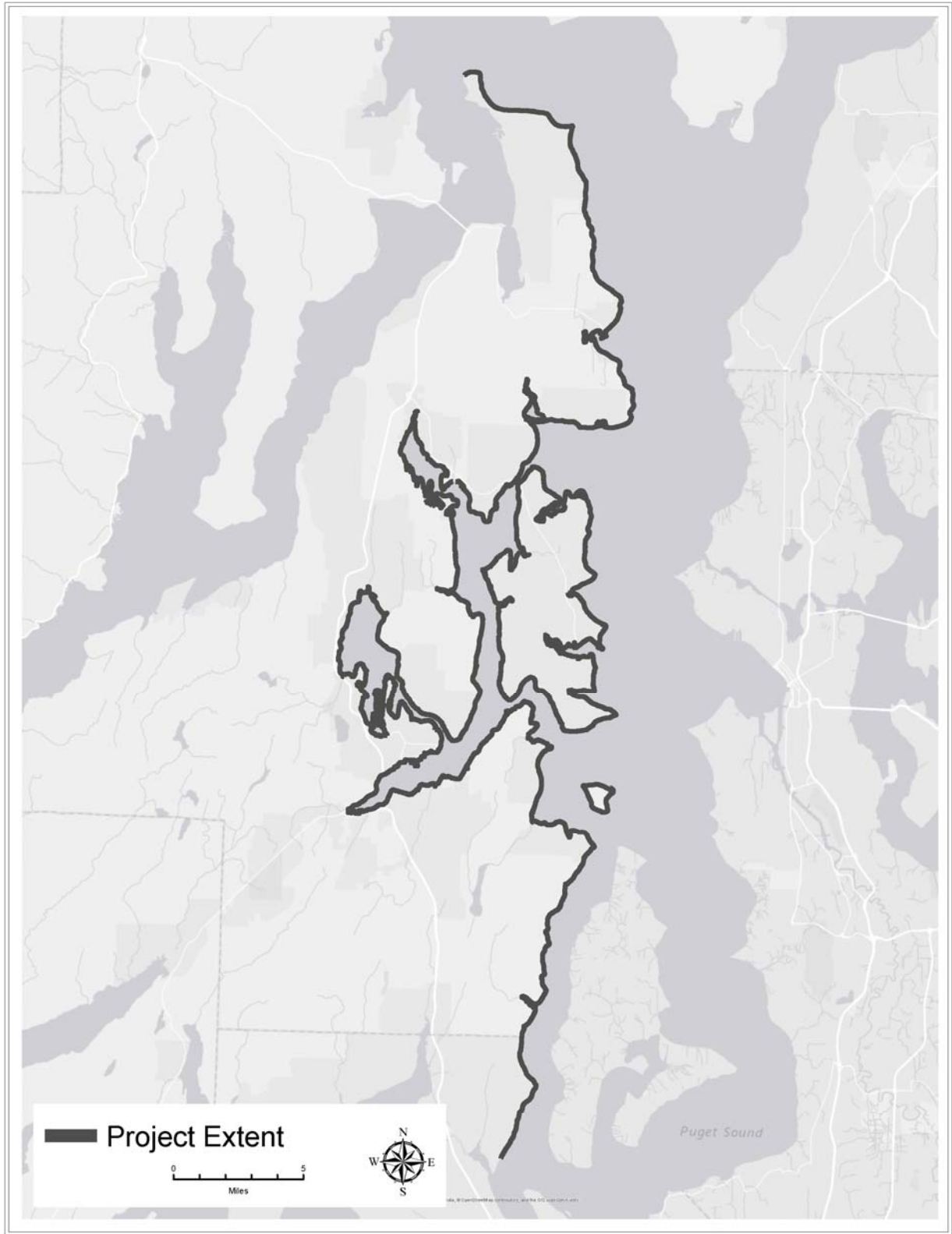


Figure 1. Map of the Project Area

Estuaries and the marine nearshore tend to be highly productive habitats where juvenile salmonids can grow rapidly. Juvenile salmon are opportunistic feeders that tend to forage on a wide diversity of prey types, including benthic/epibenthic prey (e.g., amphipods, copepods, and worms), planktonic/neritic prey (e.g., crab larvae and fish larvae), terrestrial/riparian prey (e.g., insects and spiders), and other fish (Fresh 2006). Juvenile Chinook salmon have been documented to rely upon a diverse prey base (Brennan et al. 2004, Toft et al. 2010, and Simenstad et al. 1982). The availability of prey in these areas is related to the delicate balance of water flow, sediment transport, and organic matter in and through the nearshore. As described by Sibert et al. (1977), “[n]earshore food webs are noteworthy in that they support abundant prey types that are especially important to small juvenile salmon and because they depend upon internally derived (i.e., from nearshore habitats) sources of organic matter (e.g., eelgrass).”

Juvenile salmon face several types of predators in the estuary and marine nearshore. Larger fish, birds, and mammals all prey upon salmon (Parker 1971, Fresh 1997). The availability of shallow water to escape larger fish, deeper water to avoid birds/mammals, submerged vegetation, habitat structure (e.g., wood), and even turbidity, can help reduce predation (Simenstad et al. 1982). In addition, the availability of abundant and diverse prey allows juvenile salmon to grow rapidly and outgrow many potential predators.

Prior to and during the transition of juvenile anadromous salmonids from freshwater habitats to brackish water, then salt water, then back again to fresh water as adults, their bodies undergo a major physiological transition (called smoltification) to enable the fish to survive. In large river systems, the increasing salinity gradient occurs over an extended length of the lower river, typically several miles. It is understood that part of the smoltification process occurs after the juvenile salmon enter the marine nearshore (Fresh 2006). Fresh (2006) posits that juvenile salmon habitat use in nearshore ecosystems may be partially driven by physiological needs as the fish complete their acclimation to salt water.

Studies have shown that juvenile Chinook and other salmon species use the pocket estuary habitats of stream systems other than those the fish originated from (i.e., non-natal streams) (Beamer et al. 2003, Hirschi et al. 2003). Beamer et al. (2006) documented that juvenile Chinook salmon use pocket estuary habitats in higher densities than adjacent habitats. Pocket estuaries are small embayments associated with creeks and other small freshwater inputs.

Juvenile Chinook will also move into the freshwater portions of non-natal streams to rear. In a study conducted in more than 70 streams across the Whidbey Basin portion of Puget Sound, Beamer et al. (2013) sampled the lowermost 650 feet of streams too small to support Chinook spawning and documented the regular occurrence of juvenile Chinook. This is an important finding indicating that the lower reaches of creeks that do not support Chinook spawning should be considered potential rearing habitat for juvenile Chinook migrating along the

nearshore. It should be noted that juvenile Chinook rearing in non-natal streams may extend further upstream than 650 feet, but no sampling was conducted in those areas.

The life cycle of anadromous salmonids includes migration to the ocean, and the availability of suitable migratory corridors is vital. For juvenile salmon that are dependent on the estuary and marine nearshore, the migratory corridor must provide other ecological needs, either continuously as in the case of predator avoidance, or sufficiently to enable the fish to survive and grow. Research has documented that the migration of juvenile salmon from their natal estuaries does not always occur as a directed movement (but at varied paces) toward the ocean. Instead, juvenile salmon distribute widely upon entering Puget Sound (Duffy 2003, Brennan et al. 2004, Fresh 2006), including many that move away from the ocean, thus extending their residency in Puget Sound.

A growing body of evidence shows that the early marine growth of juvenile salmon is important to the overall marine survival of salmon. Beamish and Mahnken (2001) suggested that salmonid survival during the marine phase is regulated at two stages: first, the early marine stage in which increased size leads to decreased predation risk; second, the fall/winter of their first year in salt water in which increased fitness leads to increased overwinter survival. At that life stage, fitness is linked to growth during the preceding stage. A study by Duffy and Beauchamp (2011) demonstrated the importance of early marine growth on hatchery-origin Chinook salmon. They reported that hatchery Chinook marine survival to adulthood was most strongly related to their average body size in July, with larger fish experiencing higher survival rates. The highest survival was observed in fish that were greater than 17 grams (approximately 120 mm) by July and released before May. The applicability of this finding for wild Chinook requires additional investigation.

1.4 Project Approach

The project approach had three main steps:

- 1) Integration and Synthesis of Priority Areas
- 2) Compilation of Restoration and Protection Project Opportunities
- 3) Evaluation of Project Opportunities using a Prioritization Framework

Each of these steps is described in the following sections of the report. This sequence allowed first to identify priority areas, and then to identify and evaluate project opportunities for their benefits to Chinook.

To draw upon the expertise and local knowledge of restoration and conservation specialists in the West Sound area, an Advisory Group was assembled for the project. Advisory Group participants included representatives from many cities, counties, Tribes, and non-profit

organizations (Table 1). Some Advisory Group members had participated in the preceding studies used in the integration efforts of this prioritization project, and were familiar with various relevant data sources. Over the course of the project, the Advisory Group was convened in eight meetings, some of which were conference calls, between December 2014 and September 2016. The meetings covered the following topics:

- Refine project objectives and approach
- The integration of existing nearshore assessments and priority studies
- Project geodatabase of project opportunities and associated parcels
- Prioritization framework, its components and computational details
- Scoring results of prioritization framework and recommendations for revisions
- Final prioritization framework

The Advisory Group provided inputs at these key steps throughout the project. Its role included providing review of interim deliverables, which was instrumental in developing the final prioritization framework.

Table 1. Members of the Advisory Group

Name	Agency / Entity
Christina Kereki	Kitsap County, Department of Community Development (project manager)
Brenda Padgham	Bainbridge Island Land Trust
Chris Waldbillig	Washington Department of Fish and Wildlife
Kathlene Barnhart	Kitsap County, Department of Community Development
Kathy Peters	Kitsap County, Department of Community Development
Kirstin Moerler	City of Bremerton
Lynn Wall	US Naval Base Kitsap
Marty Ereth	Pierce County
Renee Scherdnik	Kitsap County, Public Works
Scott Pascoe	Great Peninsula Conservancy
Steve Todd	Suquamish Tribe

2.0 INTEGRATION AND SYNTHESIS OF PRIORITY AREAS

An initial step in the project was to integrate the results of earlier assessments to provide a comprehensive map of priority areas. No new analysis was conducted in this project to identify priority areas; rather, the recommended priority areas of earlier efforts were compiled and integrated. The priority areas are locations recommended for identifying additional projects beyond the set of existing project opportunities initially addressed in this analysis. In subsequent steps of this analysis, the priority areas were used as a criterion for the prioritization framework, and projects in the priority areas were assigned higher scores.

Several previous habitat inventories and assessments have been conducted in the project area. These studies provided the best available information to characterize nearshore conditions. Several of these assessments identify priority areas for restoration/protection or recommended management strategies (e.g., restore, protect, or enhance) for shoreline reaches based on existing conditions. Several previous assessments have been completed in all or part of the current project area. Each assessment provides a strong technical basis for the recommendations it identified, though the methods, goals, and objectives of the assessments varied. The need to integrate the existing assessments stemmed from the fact that the studies were conducted in different parts of the project area and had different target resources or objectives, and/or different types of output recommendations.

This section describes the approach taken to synthesize and integrate the recommendations of the previous assessments into one comprehensive map of priority juvenile Chinook restoration and protection areas in the project area. The previous assessments provided science-based analyses that remain technically valid. Since the assessments focused on different areas and different components of a healthy nearshore ecosystem, the integration primarily focused on overlaying the priority areas into one comprehensive map. The following sub-sections describe the assessments available for use in the identification of priorities areas, then the sequential steps taken to develop a comprehensive map of priority areas.

2.1 Previous Assessments in West Sound

Since the early 2000s, several assessments have been conducted for all or part of the West Sound project area. As part of the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP), a prioritization analysis was conducted for all of Puget Sound, including the entire West Sound project area. Otherwise, all other available assessments focused on only a portion of the project area. Table 2 lists the existing assessments and identifies the geographic area, analysis overview, and type of recommendations provided. The assessments characterized conditions at different spatial scales that are nested within each other. Full citations of the assessments are provided in the reference section.

Table 2. Previous Habitat Inventory and Restoration Assessments in West Sound

Study	Year	Geographic Area	Overview	Type of Recommendations
Key Peninsula, Gig Harbor, and Islands Watershed Nearshore Salmon Habitat Assessment (Pentec 2003)	2003	Pierce County portion of project area, as well as entire Pierce County portion of Key Peninsula	Salmon-focused assessment of marine nearshore habitat conditions	Identifies relative habitat quality of shoreline assessment units
Kitsap Salmonid Refugia Report (May and Peterson 2003)	2003	All of Kitsap County, including West Sound and Hood Canal areas	Salmonid-focused assessment of freshwater and marine nearshore conditions	Categorizes the quality of freshwater and marine nearshore habitat as potential refuge areas for salmon; nearshore recommendations are at the scale of drift cells
Bainbridge Island Nearshore Habitat Characterization and Assessment (Williams et al. 2004)	2004	Bainbridge Island	Assessment focused on controlling factors and nearshore processes affecting habitat structures and ecological functions of the marine nearshore	Categorizes the relative level of impact at the scale of management areas and reaches; a follow-up analysis conducted as part of EPA grant identifies the management recommendations by assessment unit
East Kitsap County Nearshore Habitat Assessment and Restoration Prioritization Framework (Borde et al. 2009)	2009	Eastern portion of Kitsap County from Foulweather Bluff in north to the county line near Olalla in Colvos Passage, excluding Bainbridge Island	Assessment focused on controlling factors and nearshore processes affecting habitat structures and ecological functions of the marine nearshore	Categorizes the relative level of impact at the scale of management areas and reaches; a follow-up analysis conducted as part of EPA grant identifies the management recommendations by assessment unit
Bainbridge Island Current and Historic Coastal Geomorphic/Feeder Bluff Mapping (CGS 2010)	2010	Bainbridge Island	Assessment focused on mapping and prioritizing feeder bluff sediment sources along the marine nearshore	Priority sediment source reaches and drift cells for restoration and conservation
Strategies for Nearshore Protection and Restoration in Puget Sound (Cereghino et al. 2012)	2012	Puget Sound	Assessment of degradation, ecological restoration potential, and risk (i.e., watershed development) by shoreform	Management strategy recommendations for beaches, embayments, and coastal inlets at scale of drift cell for beaches and smaller assessment unit scale for other shoreforms
Restoration Feasibility and Prioritization Analysis of Sediment Sources in Kitsap County (Qwg Applied Geology et al. 2012)	2012	All of Kitsap County, including West Sound and Hood Canal areas	Assessment focused on prioritizing sediment sources (e.g., feeder bluffs and deep-seated landslides) along the marine nearshore	Priority sediment source reaches and drift cells for restoration and conservation

2.2 Integration of Previous Assessments

At the outset of the review of previous assessments, it was expected that the Bainbridge Island and East Kitsap County nearshore assessments (Williams et al. 2004, Borde et al. 2009) would provide priority area recommendations that would serve as the foundation for the development of a comprehensive map of priorities. These assessments provided a detailed analysis of overall ecological conditions in the nearshore. The assessments also identified recommendations for management options (i.e., restore, protect, conserve, and enhance) for each analysis reach identified for the project. However, the assessments did not identify priority areas across reaches where efforts should be focused, and therefore were not used in this effort to comprehensively identify priority areas in the project area.

Instead, the approach to identifying and integrating priority recommendations relied on other assessments that focused on specific aspects of the nearshore ecosystem. The other assessments could be organized into three types: sediment supply and transport conditions, embayment conditions, and salmon-focused habitat availability. The development of a comprehensive map of priority areas in the project area provided a measure of the relative intactness of specific processes (e.g., sediment supply and transport) or shoreforms (e.g., barrier embayments) known or thought to impact the ecological needs of juvenile Chinook. This approach was conducted sequentially using GIS map overlays, such that a comprehensive map of sediment source priorities was developed, then supplemented with recommendations focused on other shoreforms and nearshore rearing areas.

2.2.1 Beach Sediment Source Priorities

In the marine nearshore of Puget Sound, the beach habitats are formed and maintained by the delivery, transport, and deposition of sediments. Much of the sediments in the beach environments are derived from the bluffs lining many parts of the shoreline (Johannessen and MacLennan 2007). Along the shoreline, there are areas, often called feeder bluffs that supply sediment (sand, gravel, and cobble) to the beaches through natural erosion processes. Given the redistribution of sediments on the beach as wind and waves transport material, feeder bluffs often provide sediment to areas far beyond where the sediment originally fell onto the beach. The protection of feeder bluffs that currently provide sediment to long stretches of shoreline is generally considered to be more important because these bluffs make larger contributions to the availability of productive juvenile Chinook habitat than other parts of the beach. Likewise, the restoration of feeder bluffs (e.g., removal of bulkheads or other anthropogenic features that interrupt the delivery of sediments to the beach) that would provide sediment to long stretches of shoreline is generally considered to be more important because these bluffs make larger contributions to the availability of productive juvenile Chinook habitat than other parts of the beach. Priority area recommendations for sediment sources were identified from the Kitsap County Sediment Source Prioritization (Qwg Applied Geology et al. 2012) and the Bainbridge Island Feeder Bluff Prioritization (CGS 2010). The PSNERP Strategies Report (Cereghino et al.

2012) included a beach analysis that was not included because the other studies provide a more detailed analysis of sediment source priorities. As it turned out, the PSNERP beach strategy recommended priority areas were encompassed by the priority areas identified by the other studies. As such, it was also redundant to use the PSNERP beach strategy recommended priority areas.

The Kitsap Sediment Source Prioritization (Qwg Applied Geology et al. 2012) applied a scoring system to characterize the potential sediment input of source areas along the shoreline and the reduction in sediment inputs caused by shoreline modifications disconnecting the sediment sources from the shoreline. This information was used to identify priority drift cells and priority reaches for restoration and protection of sediment sources. A priority drift cell spanning the Kitsap-Pierce counties border was extended into Pierce County to fully encompass the drift cell.

For the Bainbridge Island Prioritization (CGS 2010), a similar comparison of the potential and existing sediment input conditions was used to identify sediment source priority areas along the shoreline. Each drift cell on Bainbridge Island was assigned to one of five prioritization categories ranging from “low” to “highest.” Prioritization categories were assigned separately for restoration and conservation. For the purposes of this integration effort, only those drift cells in the top two categories (highest and moderately high) for restoration or conservation were interpreted to be priority areas analogous to those identified in the Kitsap Sediment Source Prioritization. The Bainbridge Island Prioritization also identified priority feeder bluff sediment source areas. The lengths of these priority reaches varied depending on the bluff length, but were typically shorter than the reach lengths identified as priorities in the Kitsap Sediment Source Prioritization.

2.2.2 Embayment Priorities

Embayment habitats are protected estuaries and lagoons that provide low energy habitat that is both beneficial for juvenile Chinook rearing and for producing abundant prey resources. Embayments are tidally dominated systems that typically have complex shorelines and are often associated with coastal wetlands. In the PSNERP Strategies Report, Cereghino et al. (2012) evaluated two classes of embayments for the purpose of conservation planning. Barrier embayments are those embayments sheltered by a barrier beach or spit which is formed through the sediment supply, transport, and deposition processes of beaches. Coastal inlets are embayments formed in drowned stream valleys or other post-glacial landforms.

The PSNERP Strategies Report (Cereghino et al. 2012) assessed the potential and relative degradation of ecosystem services of embayments and coastal inlets. Degradation is the relative loss of historic ecosystem services through shoreline modifications. In some locations, embayments and coastal inlets have been so completely modified through fill and armoring that they have been “lost”; that is, they no longer exist as that type of shoreform. PSNERP also assessed the potential risk factors that could compromise the efficiency or effectiveness of

restoration, protection, or enhancement at each site. Risk was evaluated based on the presence/absence of multiple modifications on the shoreline and in the contributing watershed. The PSNERP Strategies Report assigned each embayment system and coastal inlet to one of six categories: Restore High, Restore, Protect High, Protect, Enhance High, and Enhance. Protection was recommended for sites with low degradation and substantial ecosystem services. Restoration was recommended for degraded sites where there is an opportunity to substantively increase ecosystem services in a self-sustaining way. Enhancement was recommended for degraded sites where there is limited ability to restore self-sustaining ecosystem services because the degradation is so complex or intense. Enhancement refers to actions that improve habitat structures at a site, but are not as sustainable or beneficial as restoration that address the habitat-forming processes.

Embayments and coastal inlets identified in the PSNERP Strategies Report as Restore High, Restore, Protect High, and Protect were included as priority areas in this integration to develop a comprehensive map of priorities. In some locations, these priority areas coincided with or expanded the priority areas identified through the sediment input assessments. This relationship between the embayment and sediment priorities is advantageous because of the dependence of barrier estuaries and barrier lagoons on the sediment input and transported along the beaches. The sediment sources provide the sediment that forms the barrier beaches.

2.2.3 Salmon Habitat Focused Priorities

The last step in identifying priority areas was to use information from two salmon-focused habitat assessments. One, the Key Peninsula Assessment (Pentec 2003), added recommendations for the approximately 6-mile-long Pierce County portion of the study area. The other, the Salmonid Refugia Report (May and Peterson 2003) added salmon-specific priority areas.

Using the Key Peninsula Assessment, shoreline priorities were identified using relative habitat quality, sediment source information, and shoreline armoring locations. Relative habitat quality was characterized using a scoring system based on the presence/absence of numerous habitat parameters (e.g., eelgrass and freshwater inputs) and modifications (e.g., bulkheads and overwater structures). The Pierce County portion of the project area includes two full drift cells that converge at Point Richmond and the southern end of a drift cell that continues an extended distance into Kitsap County. The southern end of the drift cell continuing into Kitsap County was identified in this integration effort as a priority in order to make the entire drift cell a priority. The drift cell south of Point Richmond was also identified as a priority. It is the longest drift cell in the Pierce County portion of the project area. It includes long stretches of active feeder bluffs with variable amounts of existing shoreline armoring. Reach priorities were identified where active feeder bluffs are located and in a reach north of Point Roberts where extensive fill interrupts sediment transport along the beach.

The Salmonid Refugia report identified potential salmonid conservation and restoration areas in Kitsap County. The project's emphasis was on identifying high-quality habitat most worthy of protection. The study identified only a limited number of nearshore refugia in the West Sound portion of Kitsap County and many more were identified in the Hood Canal portion of the County. One reach near Point No Point was identified as having excellent habitat and two reaches along the northeast portion of Bainbridge Island were identified as having good quality habitat. All other portions of the shoreline were identified as degraded or were not characterized in the report maps. The excellent and good reaches were used to inform the West Sound integration of priorities, although these recommended areas were almost entirely also identified by the sediment assessments described above.

2.3 Identification of Priority Areas for Restoration and Protection

To support the subsequent project steps of identifying and ranking project opportunities, the priority reaches and drift cells identified through the integration (Section 2.3) described above were converted to the nearshore assessment units (NAUs) of two studies by Battelle: East Kitsap Habitat Inventory (Borde et al. 2009) and Bainbridge Island Nearshore Habitat Characterization (Williams et al. 2004). The Battelle studies were previously combined into one geodatabase for the entire Kitsap County portion of the study area. These NAUs are part of a geodatabase that includes the habitat inventory and modification information from the field investigations conducted as part of those two assessments. Since the NAUs do not completely align with the reach breaks identified in the sediment studies, this conversion resulted in some expansion in the size of the priority reaches. For the Pierce County portion of the project area, the Key Peninsula Assessment delineated assessment units (AUs) are analogous to the NAUs delineated in the Kitsap portion of the project area.

The maps showing the integrated priority drift cells and priority reaches are provided in Figures 2 and 3. The high-priority and moderate-priority drift cells shown in Figure 2 are the recommended areas to target recovery efforts addressing sediment supply and transport. The priority reaches shown in Figure 3 are a mix of the more specific sediment supply and transport priority areas, embayments, and salmon-focused target areas. As described earlier, the priority areas are locations recommended for identifying additional projects beyond the existing set of project opportunities initially addressed. The prioritization framework was developed with the integrated priority areas as a criterion for project evaluation, and project opportunities in priority areas were assigned higher scores.

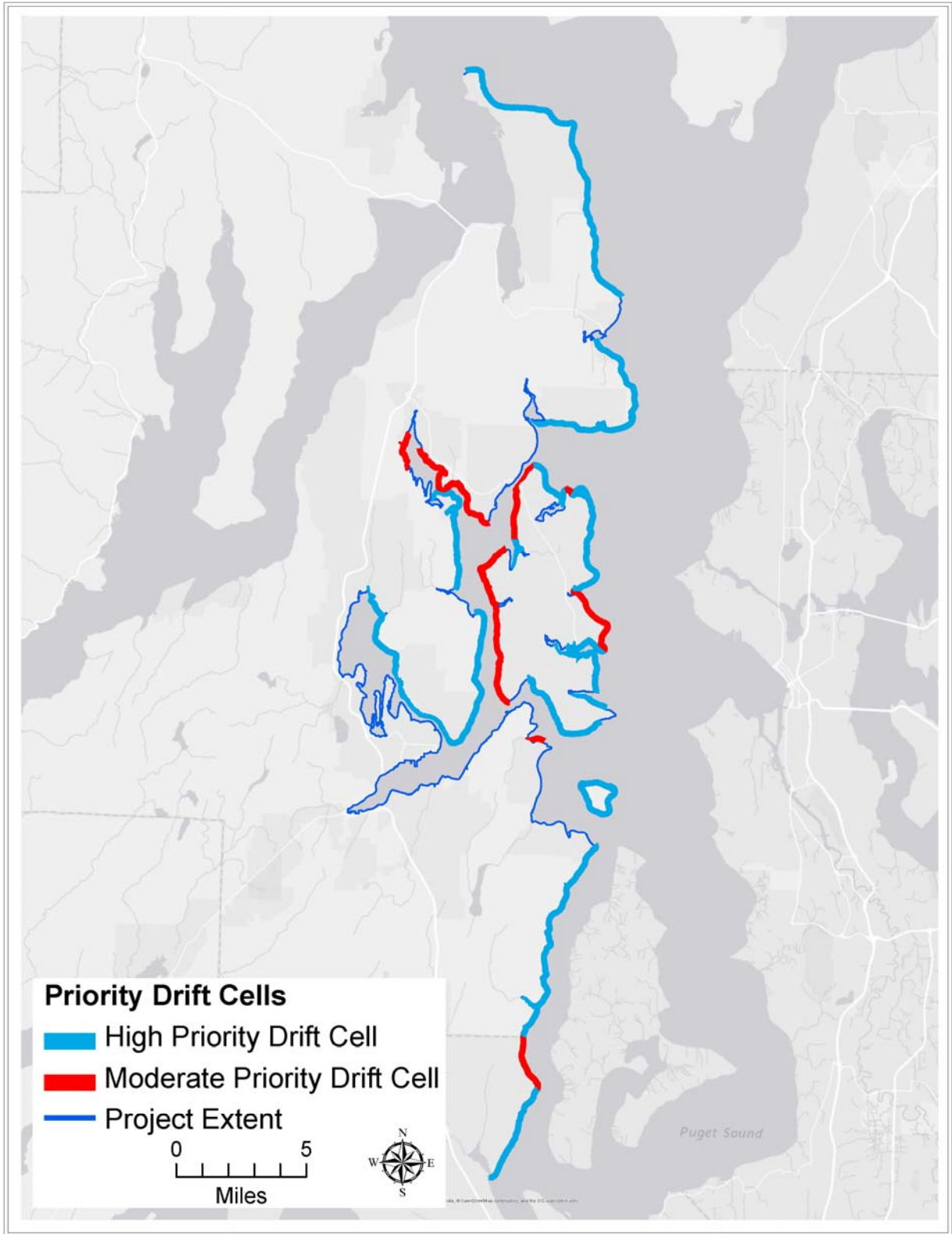


Figure 2. Priority Drift Cells in West Sound

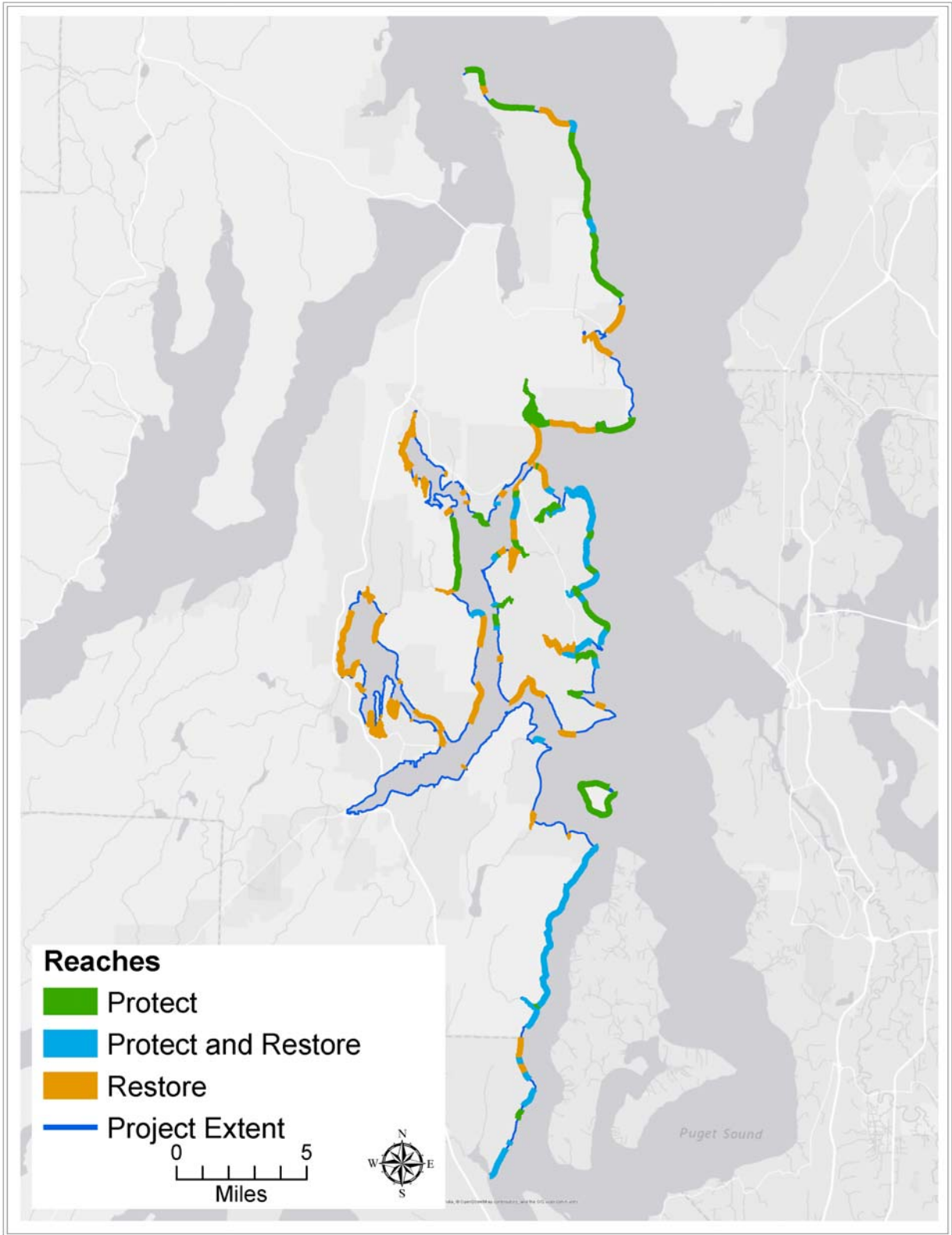


Figure 3. Priority Reaches in West Sound

3.0 COMPILATION OF PROJECT OPPORTUNITIES

Existing project opportunities were compiled from multiple data sources including Shoreline Master Program updates and Public Works transportation improvement lists. These data sources included:

- Shoreline Master Program Restoration Plans
 - Kitsap County
 - City of Bainbridge Island
 - City of Bremerton
 - City of Port Orchard
 - City of Poulsbo
- Transportation and Capital Improvement Projects
 - Kitsap County
 - City of Bremerton
 - City of Port Orchard
 - City of Poulsbo
- Kitsap County Public Works Draft Intertidal Restoration Projects

Existing project opportunities on the marine shoreline or on creek locations within 650 feet of the shoreline were included in the database. As described previously, these areas are known to provide rearing habitat for natal and non-natal juvenile Chinook salmon in Puget Sound.

Within these areas, the degree of intactness of sediment supply, sediment transport, and tidal flow processes, as well as fish passage, were considered the most significant factors affecting the quality and quantity of rearing habitat available for juvenile Chinook. The PSNERP Strategic Needs Assessment (Schlenger et al. 2011) showed that the condition of sediment input and tidal flow processes were the main drivers of overall nearshore process degradation. Projects in the West Sound project area that address the restoration or protection of sediment and tidal flow processes, as well as fish passage, were included in the database, because of the key role these processes have in shaping and maintaining nearshore habitats and biological functions. Intact nearshore processes shape and sustain coastal landforms and drive the formation of ecosystem structure that in turn supports nearshore habitats. Process-based restoration addresses the impacts to nearshore processes caused by stressors and aims to return the landscape to its near pre-disturbance, self-sustaining state (Van Cleve et al. 2004).

Projects that primarily address structural elements, such as overwater structure and derelict pile removal, beach nourishment, and revegetation, were not included as standalone projects. They are recognized as additional, site-specific actions that should be included, as possible, in process-focused restoration projects. For example, a restoration project to remove restrictions to tidal flow should include revegetation of the marine riparian corridor to also achieve the multiple benefits the vegetation can provide.

The project database identifies projects at the parcel scale. Parcels were identified as the preferred unit of analysis for projects because it represents an implementable unit from which all other work can scale up. For each project opportunity identified, all parcels comprising the opportunity were included.

The dataset of compiled existing opportunities was more limited in number and type than expected. Many projects listed in the data sources were not process-based opportunities that could substantially benefit the marine nearshore. Protection project opportunities did not exist within the data sources and consequently were absent in the compiled database. To supplement the project opportunity list, a GIS-guided remote reconnaissance of the study area was performed by reviewing Ecology's shoreline oblique images and T-Sheets. New project identification focused on opportunities to restore and/or protect nearshore processes that create and maintain nearshore habitats; specifically, sediment supply, sediment transport, tidal inundation, and cross-shore connectivity. The project identification also looked for opportunities to remove barriers to fish passage at or near the mouths of streams. Many of the project opportunities could address multiple project types (e.g., a fish passage barrier removal project that improves tidal flow). Following is a brief description of each project type:

- Sediment supply (SS) – project addresses the connection of feeder bluffs and the aquatic zone of the nearshore by removing/preventing shoreline armoring along shorelines with sediment sources.
- Sediment transport (ST) – project addresses the movement of sediment alongshore by removing/preventing impediments along beaches not identified as being sediment source areas.
- Cross-shore connectivity (XS)– project addresses impediments to the connection between upland and aquatic habitats in areas delineated as having no appreciable drift of sediment.
- Tidal flow (TF) – project addresses the extent of tidal inundation and the hydraulic connection between salt marshes and the adjacent beaches by removing/preventing fill, armoring, or constrictions at the outlet of embayments.
- Fish passage (FP) – project addresses identified barriers to fish passage in streams.

Many project opportunities could address multiple project types (e.g., a fish passage barrier removal project that improves tidal flow). It is anticipated that many projects in the database will also offer additional elements such as additional project types, other improvements (e.g., revegetation), and combination elements (e.g., restoration and protection).

GIS data used in the project identification included: stressor data (e.g., from assessments described above), shoreform mapping (PSNERP), historical T-sheets, and restoration prioritization data (e.g., from assessments described above). GIS queries were developed to target the identification of specific types of restoration opportunities. Linkages between nearshore processes and stressors documented by PSNERP guided the decision making for the projects identification process in GIS (Simenstad et al. 2006). Nearshore stressors, such as shore armor, fill, and tidal barriers, impact different nearshore processes in different shoreline environments or shoreforms (Table 3; Schlenger et al. 2011).

Table 3. Linkages between PSNERP Nearshore Processes and Stressors

Stressor (Change Analysis Categories [Tiers])	PSNERP Nearshore processes										
	Sediment Input	Sediment Transport	Erosion/Accretion of Sediment	Tidal Flow	Tide Channel Formation and Maintenance	Distributary Channel Migration	Freshwater Input	Detritus Import and Export	Exchange of Aquatic Organisms	Physical Disturbance	Solar Incidence
Shoreline Armoring (2)	✓	✓	✓	o	o	✓	o	✓	✓	✓	o
Breakwaters and Jetties (2)	o	✓	✓			o		o	✓	✓	o
Tidal Barriers (2)		✓	✓	✓	✓	✓		✓	✓	o	
Nearshore Fill (2)	✓	✓	✓	✓	✓	✓	o	✓	✓	✓	o
Roads (2, 3, 4)	✓	o	✓	✓	o		o	✓	✓	✓	o
Overwater Structures (2)	o	o	o					o	✓	o	✓
Marinas (2)	o	✓	✓	o	o		o	o	✓	✓	✓
Railroads (2, 3, 4))	✓	o	✓	✓	o	o	o	✓	✓	✓	o
Land Cover Development(3, 4)	o		o			o	o	✓			✓
Impervious Surface (3, 4)	o						✓	o			✓
Stream Crossings (3, 4)			o					o	✓		✓
Dams (4)	✓	✓	o			✓	✓	o	✓	o	

Note: ✓ denotes a direct connection, or impact on process resulting from stressor
 o denotes indirect or partial impact on process resulting from stressor

Source: Schlenger et al. (2011)

Projects were identified and attributed based on the types of nearshore processes that would be restored or protected. Table 4 describes the types of actions, the feasibility considerations applied, and the GIS queries run to inform the identification of each project type.

Some subjectivity and professional judgment were applied to the project identification process. A coarse feasibility filter was applied to ensure that high-risk projects with likely liabilities would not be recommended. For example, armor removal projects were only included when

nearshore structures and/or improvements were of adequate distance from the crest of the bluff or shoreline such that they would not likely be threatened by erosion if the armor was removed.

Table 4. Linkages between Nearshore Processes Being Restored, Project Objectives, Feasibility Filters, and GIS Queries Used to Identify Potential Projects

Nearshore Process Restored (Abbreviation)	Description or Objective	Feasibility Filter	GIS Queries Used to Identify
Sediment Supply (SS)	Remove armor from bluff backed beach. Restore bluff erosion in a drift cell.	Improvements must be at least 40 feet from bluff crest. Typically excluded sites with major hardscaping due to prohibitive costs.	Bluffs with waterward shoreline armor and air photo review.
Sediment Transport (ST)	Remove armor from non-bluff shore. Restore beach profile using beach nourishment. Must be in drift cell.	Improvements must be at least 40 feet from the WDNR shoreline.	Groins and shore armor (not feeder bluffs).
Cross-Shore (XS)	Restore connectivity between the upland and marine areas.	Remove armor and restore marine riparian gradient.	Armor and fill within protected shores where there is no risk of erosion. Intertidal habitat loss.
Tidal Flow (TF)	Remove fill, debris, tide gate/culvert or obstruction to tidal flushing. Restore tidal channel.	Restoration will not result in substantial flooding.	Lost embayment, lost historical wetlands.
Fish Passage (FP)	Restore fish passage.	Remove or daylight a partial or full barrier to fish passage.	Select parcels that encompass fish passage barriers.

This coarse-level feasibility screening should not and cannot take the place of a comprehensive feasibility assessment, which would typically be conducted prior to project design development. For example, critical elements of feasibility that were not explored in this screening process included landowner willingness, cost, and implications of climate change. Project opportunities were identified for public and private parcels. Inclusion in the database does not suggest or imply landowner willingness. Having willing landowner(s) is a necessary first step for advancing projects to design and implementation. Project opportunities identified for the database were reviewed by Kitsap County and some members of the Advisory Group and refined as needed.

A separate effort was completed to identify restoration projects entailing the removal or relocation of shoreline roads. Road opportunities were identified based on the road's proximity to the shoreline, location within the FEMA Floodplain, and consideration of feasibility. Feasibility was assessed remotely using aerial imagery to evaluate the potential for alternate routes or road removal with minimal rerouting of traffic flow. The presence of shoreline houses and businesses located along the road was a primary factor for not identifying roads as feasible project opportunities. In total, 12 shoreline roads projects were included as restoration opportunities in the projects database. While some or most of these identified road

opportunities may appear unrealistic today, the degree of willingness to consider them as possible projects may change in the future as conditions change (e.g., sea level rise and flood risk).

The resulting database of compiled and new project opportunities contains 333 restoration projects, 84 protection projects, and 3 combination projects that include restoration and protection elements. The opportunities throughout the project area are shown on the next page in Figure 4 (the 3 projects that include restoration and protection actions are shown as protection projects). A map portfolio of the project locations is provided in Appendix A. In addition, interactive maps showing project location and project details are available at ArcGIS Online (search West Sound Nearshore) and through Kitsap County Department of Community Development. These 420 projects span 1,222 parcels. For context, the 1,222 project parcels were approximately 5% of the total number of shoreline parcels in the project area. The number of projects and parcels of each project type is summarized in Table 5.

Table 5. Summary of the Number of Projects and Parcels included in the Project Database

Project Type	Restoration		Protection		Combined Restoration and Protection	
	# Projects	# Parcels	# Projects	# Parcels	# Projects	# Parcels
Sediment Supply	67	177	35	116	0	0
Sediment Transport	112	417	15	47	0	0
Cross-Shore Connectivity	28	69	3	4	0	0
Tidal Flow	17	29	23	88	0	0
Fish Passage	66	67	0	0	0	0
Multiple Processes	43	146	8	42	3	20
TOTAL	333	905	84	297	3	20

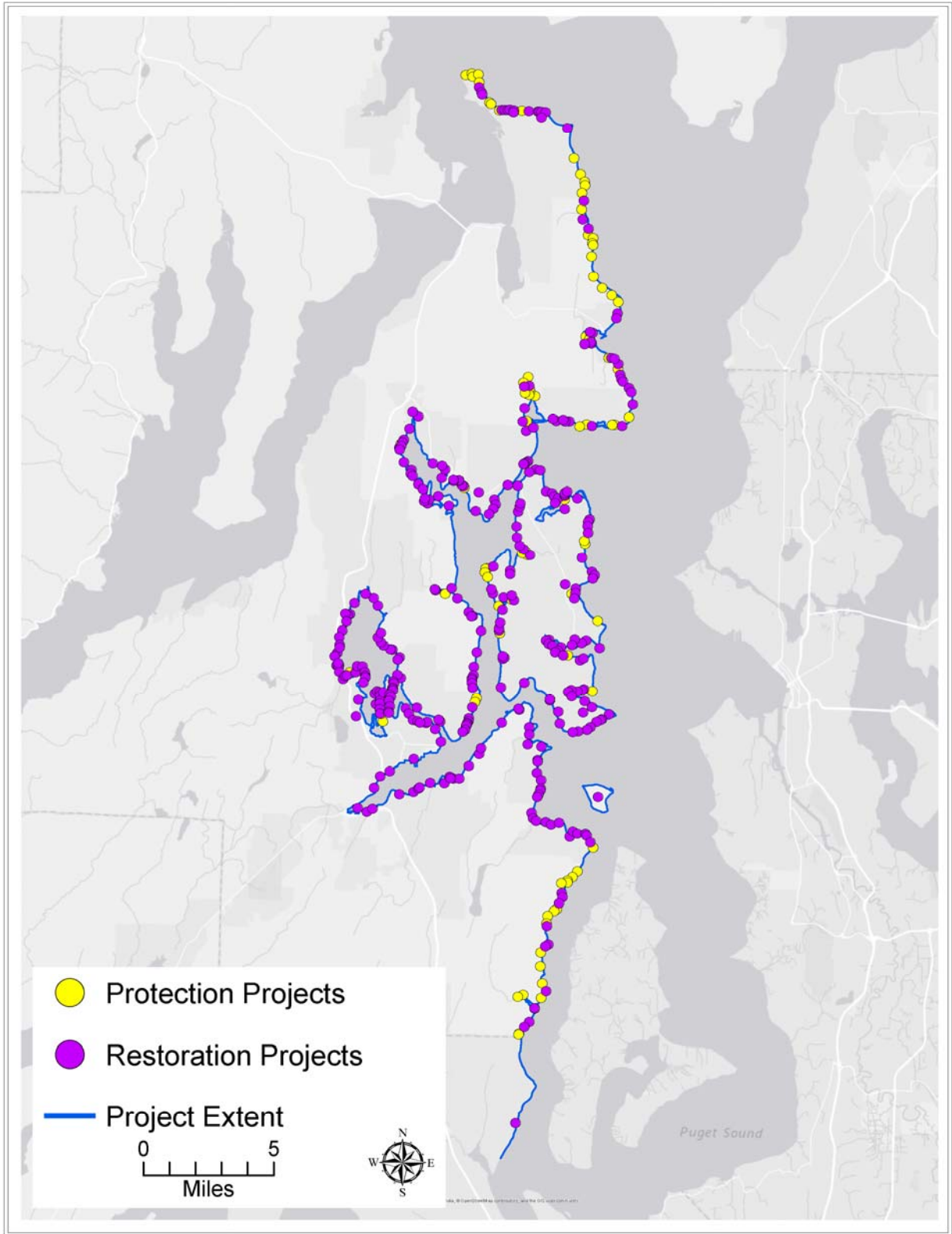


Figure 4. Distribution of 420 Restoration and Protection Projects Evaluated in West Sound

4.0 PRIORITIZATION FRAMEWORK METHODS

The basis of the prioritization is a numerical framework that assigns scores to each project opportunity. The purpose of developing a prioritization framework is to provide a structured accounting system for estimating the anticipated process-based benefits that a project would provide for juvenile Chinook in the project area. Specifically, the framework evaluates how projects contribute to the protection or restoration of the habitats the fish use while rearing and migrating along the nearshore. The prioritization framework focuses on characterizing the benefits based on best available science with the expectation that subsequent steps towards project implementation will consider feasibility issues such as landowner willingness and cost.

To inform the development of the prioritization framework, previous nearshore assessments and prioritizations in Puget Sound were considered. The intent was to incorporate applicable analysis elements, given the project objectives and that could be supported by the available data. The assessments most relied upon were the East Kitsap County Nearshore Habitat Assessment and Restoration Prioritization Framework (Borde et al. 2009), the WRIA 1 Nearshore and Estuarine Assessment and Restoration Prioritization (MacLennan et al. 2013), and the Puget Sound Nearshore Ecosystem Restoration Project Ecological Output Model (Jackels et al. 2012) (Table 2). Each of these assessments developed a framework for assessing the benefits of specific projects, whereas many other nearshore assessments have stopped at the identification of priority areas. Each of the assessments also assigned the highest scores for projects providing process-based benefits.

The conceptual models were similar among the three assessments and include physical processes, habitat structure, and biological functions. The conceptual model in MacLennan et al. (2013) presented in Figure 5 depicts the relationship between process, structure, and function. Processes are the natural flow, fluxes, and transformations that occur within or between ecosystems that influence the structure of the nearshore and its biological functions (Cereghino et al. 2012). Processes not only shape structure, but respond to ecosystem structure (e.g., the presence of eelgrass structure can locally influence sediment transport and deposition processes). Processes and structures both strongly dictate the biological functions supported in an area.

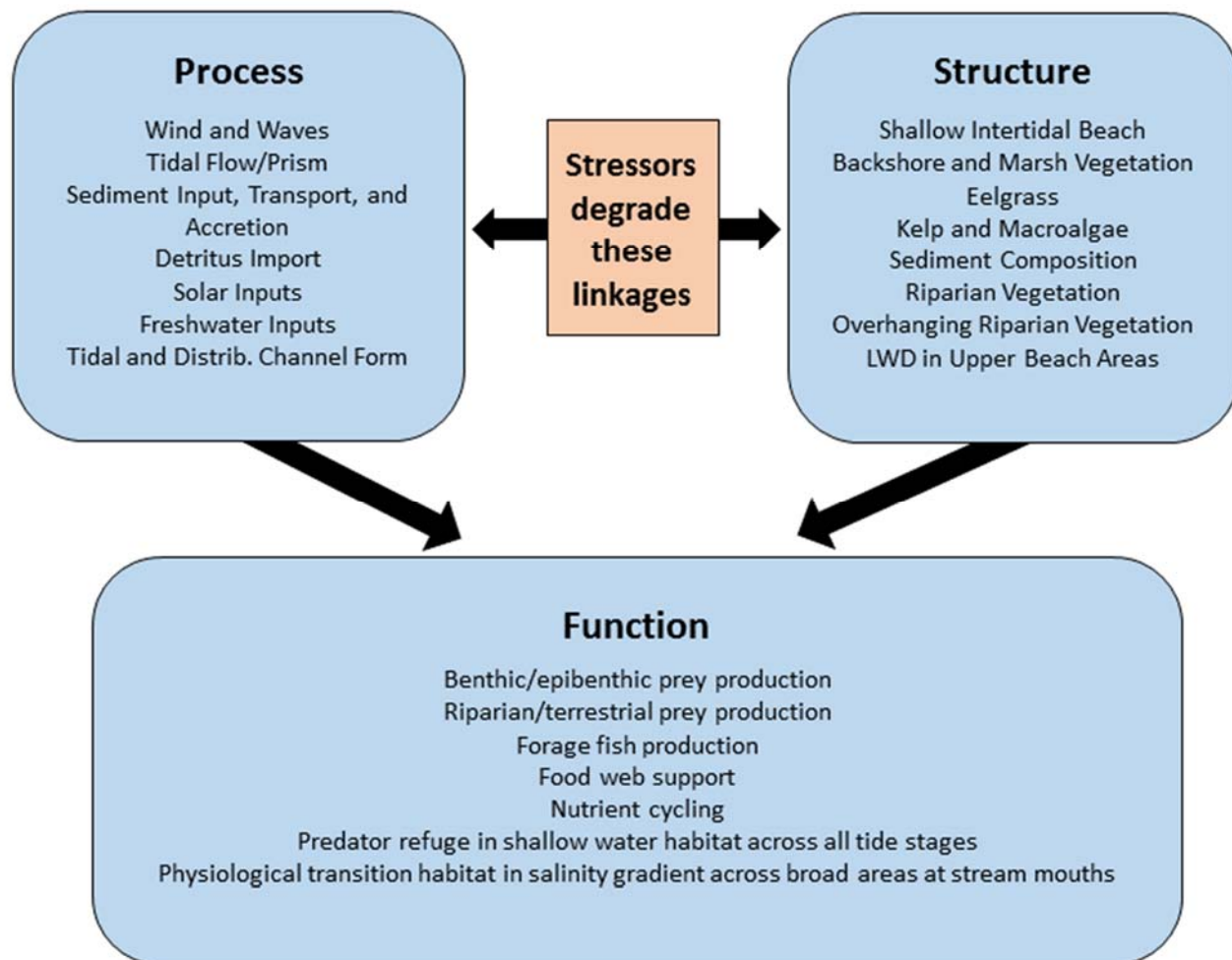


Figure 5. Conceptual Model Depicting the Linkages between Process, Structure, and Function, including the Effects of Stressors

Process-based restoration and protection provides more certainty of long-term success than structural restoration, because it addresses the underlying factors influencing the structures and functions of the ecosystem. As noted in PSNERP documentation, restoration of degraded physical processes will maximize the sustainability and resilience of a complex nearshore ecosystem structure (Cereghino et al. 2012, Goetz et al. 2004, Greiner 2010). A complex and dynamic nearshore ecosystem with intact processes is more likely to continue to provide beneficial functions into the future, as compared to systems with degraded processes.

4.1 Input from Advisory Group on Comparative Benefits of Project Types

Science informs our knowledge of the relationships between nearshore processes, habitats, and functions, and the impacts modifications can have on them. However, nearshore science is not advanced enough to empirically assess the benefits of one project type versus another (i.e., sediment supply versus tidal flow restoration) or how project size may affect the ranking of

these project types against each another. Therefore, some professional judgment and subjectivity is involved in comparing the various sizes and types of projects in the list of project opportunities.

To help inform decisions about how the prioritization framework should evaluate and score different project types and varied sizes of projects, the Advisory Group was polled in a survey. The survey sought input on three topics: the relative benefits of several types of projects, the relative benefits of different types and sizes of projects, and the relative benefits of restoration versus protection.

Eleven Advisory Group members responded to the survey. In response to the question about the relative benefits of different project types, tidal flow restoration projects were identified as the most beneficial, followed by fish passage restoration and sediment supply reconnection (Figure 6). Figure 6 presents the average score, with the error bars indicating the range of all scores received. Those three project types received votes among survey responses as the highest-ranking project type. Cross-shore connectivity restoration received the lowest ranking.

The next question factored in size of the projects with respect to the top three project types. Without additional contextual information about the projects, large (>2.5 acre) tidal flow reconnection projects ranked the highest (Figure 7). Figure 7 presents the average score, with the error bars indicating the range of all scores received. Large (>1,000 ft) sediment supply reconnection projects ranked second, followed by restoration of fish passage past a partial barrier to more than one mile of habitat. Interestingly, large sediment supply reconnection projects received the most top-ranking votes, but the tidal flow reconnection projects were more consistently ranked among the top two, so the average score was higher. The mid-sized sediment supply reconnection and tidal flow restoration projects were in the next ranking tier and averaged about the same score. The small sediment supply reconnection and tidal flow restoration projects ranked the lowest and averaged the same score.

In response to the question about whether restoration or protection projects rank higher, the responses were evenly split. Four responses leaned toward restoration being more beneficial and four responses were for protection. Three responses indicated the benefits were about equal and prioritization would depend on other important contextual information.

4.2 Prioritization Framework Formula and Scoring

One objective for this prioritization framework was to make it applicable for restoration and protection actions, as well as across multiple project types that benefit juvenile Chinook salmon. The intent was to provide a framework that would allow for comparison of the relative merits of different projects to help inform where efforts should be focused to provide the greatest gains in recovering Chinook salmon.

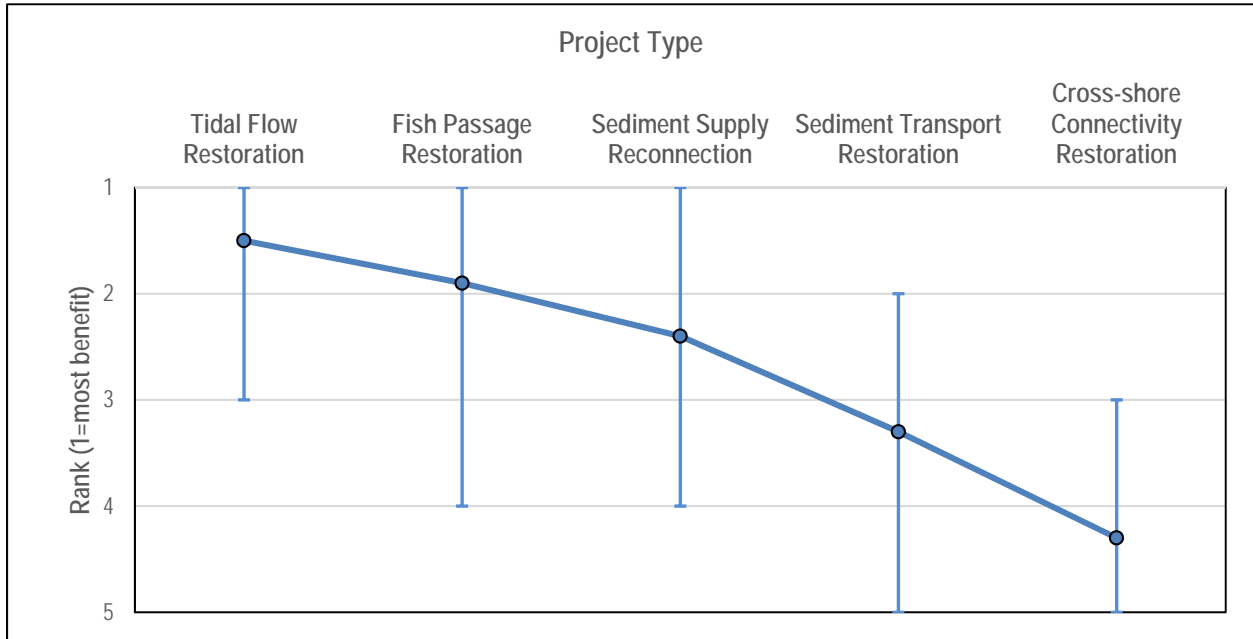


Figure 6. Ranking of Project Type Benefits based on Input from Advisory Group

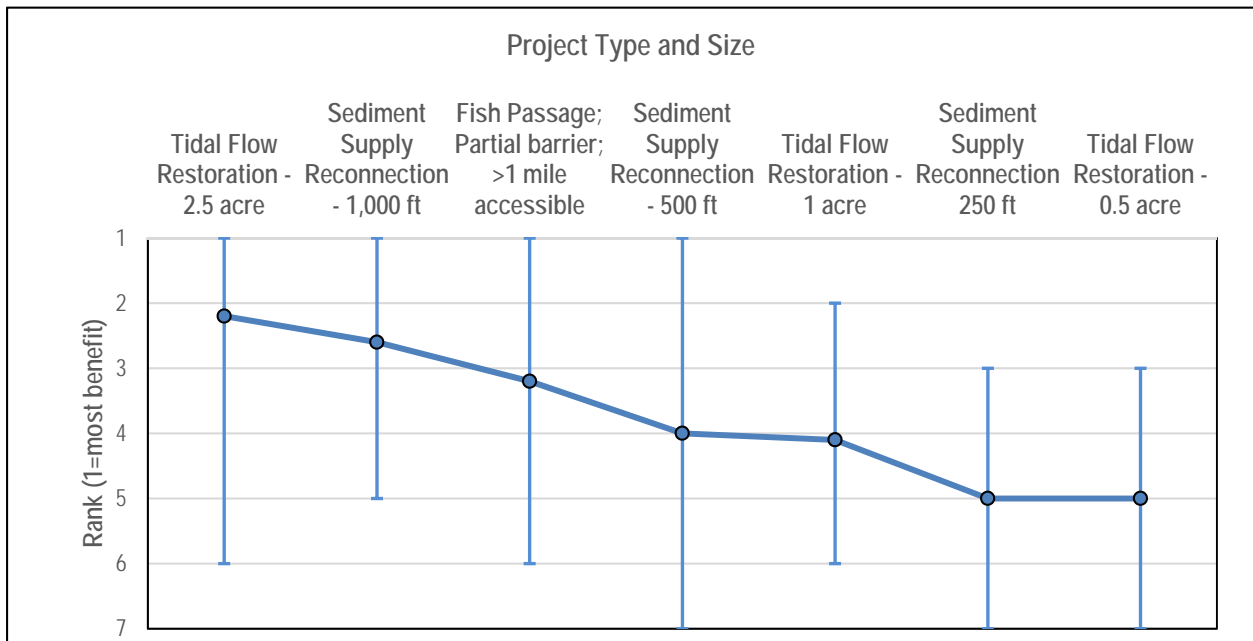


Figure 7. Ranking of Project Type and Size Benefits based on Input from Advisory Group

The development of a prioritization framework includes both the identification of parameters to include in the analysis and the scoring system of those parameters. Both aspects of the development were informed by the conceptual model of how nearshore systems work (see Figure 5), the ecological needs of juvenile Chinook in the nearshore, and the available data for the project area. The Advisory Group input from the survey was considered in interpreting

initial iterations of the framework and refining the scoring system. A recommended prioritization framework was developed through an iterative development process.

The framework includes four components:

- benefits to process,
- site suitability,
- benefits to structure and function, and
- size.

Each component includes multiple contributing metrics. The formula for the framework is:

$$\text{Score} = [(\text{Process} * \text{Suitability}) + (\text{Structure and Function})] * \text{Size}$$

The first two terms in the formula, Process and Suitability, are multiplied together to significantly contribute to the overall score. Process benefits are indicative of true restoration that will support and maintain natural nearshore conditions. Suitability indicates that the project opportunity is “the right project in the right place” for both addressing priority needs and in a location where the project will be sustainable. Structure and Function have a lesser contribution to the formula relative to Process because of the importance of processes in forming structure and, in turn, function. Size is multiplied by all other terms because of the importance of project size to the scale of the potential benefits and the fact that larger projects are more likely to be successful than smaller ones.

The scoring for each component of the formula is different depending on project type. The scoring rules for the Process and Suitability components are described in Tables 6 and 7, respectively. The scoring rules for Structure and Function are described in Table 8 and the scoring for the Size component is described in Table 9. The formula applies to restoration and protection projects. Each input parameter is input for restoration and protection projects. The input for size differs between restoration and protection, as restoration size is based on the modification size (e.g., length of armoring) whereas the protection size is based on the length or area without modifications (e.g., length of parcel along shoreline). The formula also can be used to evaluate projects that are more structural focused. The projects are referred to as “other project types.” Currently, there are no other project types in the database, but the framework can be used in the future to score those projects.

The recommendation prioritization framework is the outcome of an iterative development process. For each iteration, the scoring outputs were evaluated on whether the points assigned to different types of projects resulted in satisfactory relative scores. Also considered in the evaluation of scoring outputs was the Advisory Group input on the relative benefits of different project types. Adjustments were made in the scoring assignments and scoring elements included, after examining the results of each subsequent iteration (totaling seven iterations).

Table 6. Scoring Rules for the Process Component of the Prioritization Framework

Process Score by Project Type	Scoring	Data Sources Used to Inform Scoring
Sediment Supply (SS)	2	Used Ecology drift cell data (Shipman et al. 2014) and calculated site location within drift cell. Priority drift cells based on integrated priorities described in Section 2.0.
	+	
	(3 * proportion of drift cell length located downdrift of project in a priority drift cell)	
	+	
	(1 * proportion of drift cell length located downdrift of project in a moderate priority drift cell)	
+		
	1 if project benefits accretion shoreform protecting an embayment	Used MacLennan et al. (2013) feeder bluff mapping which included identification of accretion shoreforms
Sediment Transport (ST)	1	Used Ecology drift cell data (Shipman et al. 2014) and calculated site location within drift cell. Priority drift cells based on integrated priorities described in Section 2.0.
	+	
	(1.5 * proportion of drift cell length located downdrift of project in a priority drift cell)	
	+	
	(0.5 * proportion of drift cell length located downdrift of project in a moderate priority drift cell)	
+		
	1 if project benefits accretion shoreform protecting an embayment	Used MacLennan et al. (2013) feeder bluff mapping which included identification of accretion shoreforms
Tidal Flow (TF)	3	PSNERP mapping (Simenstad et al. 2011) and aerial imagery interpretation
	+	
	1 if project restores tidal connectivity to an existing embayment	
Fish Passage (FP)	6 if project addresses full barrier on salmon-bearing stream	Presence of barrier and degree of fish passage blockage based on the WDFW Fish Passage Barrier database (WDFW 2016) and Wild Fish Conservancy (2014) Water Typing inventory of barriers. Fish use information is based on the WDFW and NWIFC Statewide Washington Integrated Fish Distribution database (2014) and Wild Fish Conservancy Water Typing inventory of fish presence.
	4 if project addresses partial barrier on salmon-bearing stream	
	3 if project addresses full barrier on cutthroat trout stream	
	2 if project addresses partial barrier on cutthroat trout stream	
	1 if project addresses full barrier on non-salmon-bearing stream	
	1 if project addresses partial barrier on non-salmon-bearing stream	
Cross-Shore Connectivity (XS)	1	
Other Project Types	1	

Table 7. Scoring Rules for the Suitability Component of the Prioritization Framework

Suitability Metric for All Project Types	Scoring	Data Sources Used to Inform Scoring
Match to Management Strategy	3 if restoration action in restoration priority reach for that type of project	Priority reaches based on integrated priorities described in Section 2.0.
	3 if protection action in protection priority reach for that type of project	
	1.5 if restoration action in protection priority reach for that type of project	
	1.5 if restoration action in restoration priority reach for a different type of project	
	1.5 if protection action in restoration priority reach for that type of project	
	1.5 if protection action in protection priority reach for a different type of project	
	1 if not in a priority reach	
Match to Nearshore Assessment Management Recommendation	1 if project prescription (e.g., protect, restore) matches assigned management recommendation or addresses an identified fish passage barrier	Management recommendations from East Kitsap Nearshore Inventory (EKNI; Borde et al. 2009), City of Bainbridge Island Nearshore Inventory (Williams et al. 2004), and Key Peninsula Nearshore Inventory (Pentec 2003)
Sustainability in Area	1 if drift cell score in EKNI study = 1 (i.e., low degradation of drift cell)	Drift cell degradation analysis in EKNI (Borde et al. 2009), City of Bainbridge Island Nearshore Inventory (Williams et al. 2004) and interpreted from analysis in Key Peninsula Nearshore Inventory (Pentec 2003)
	0.5 if drift cell score in EKNI study = 2 (i.e., moderate degradation of drift cell)	
	0 if drift cell score in EKNI study = 3 (i.e., high degradation of drift cell)	

Table 8. Scoring Rules for the Structure and Function Component of the Prioritization Framework

Structure & Function Score by Project Type	Scoring	Data Sources Used to Inform Scoring
Sediment Supply, Sediment Transport, or Cross-Shore Connectivity	1 if eelgrass is onsite and an additional 0.5 if eelgrass is downdrift	WDNR ShoreZone Inventory (2001) with analysis of downdrift eelgrass within drift cell
	+	
	1 for each forage fish species (surf smelt, Pacific sand lance, and Pacific herring) documented spawning at project site	WDFW Forage Fish Spawning database (2016) with analysis of downdrift spawning within drift cell
	+	
	0.5 for each forage fish species (surf smelt, Pacific sand lance, and Pacific herring) documented spawning downdrift of the project site and an additional 0.5 points if spawning has been documented in multiple sites downdrift	
+		

Structure & Function Score by Project Type	Scoring	Data Sources Used to Inform Scoring
	1 if closed canopy and other natural vegetation occurs in more than 50% of the 200 ft shoreline buffer	Point No Point Treaty Council (PNPTC) Riparian Land Cover Vegetation Study (2015) for Kitsap County areas and analysis of aerial imagery to characterize riparian vegetation in Pierce County
Tidal Flow	1 if eelgrass is onsite	WDNR ShoreZone Inventory (2001) with analysis of downdrift eelgrass within drift cell
	+	
	1 for each forage fish species (surf smelt, Pacific sand lance, and Pacific herring) documented spawning at project site	WDFW Forage Fish Spawning database (2016) with analysis of downdrift spawning within drift cell
	+	
Fish Passage	2 if documented freshwater wetlands within 650 ft upstream of barrier	U.S. Fish and Wildlife Service National Wetland Inventory data (2016) and wetland data from Kitsap County and Pierce County
	+	
	2 if documented tidal wetlands within 650 ft upstream of barrier	PSNERP current tidal wetlands data (Simenstad et al. 2011)
	+	
Other Project Types	1 if eelgrass is onsite and an additional 0.5 if eelgrass is downdrift	WDNR ShoreZone Inventory (2001) with analysis of downdrift eelgrass within drift cell
	+	
	1 for each forage fish species (surf smelt, Pacific sand lance, and Pacific herring) documented spawning at project site	WDFW Forage Fish Spawning database (2016) with analysis of downdrift spawning within drift cell
	+	
	1 if closed canopy and other natural vegetation occurs in more than 50% of the 200 ft shoreline buffer	PNPTC Riparian Land Cover Vegetation Study (2015) for Kitsap County areas and analysis of aerial imagery to characterize riparian vegetation in Pierce County

Table 9. Scoring Rules for the Size Component of the Prioritization Framework

Size by Project Type	Scoring	Data Sources Used to Inform Scoring
Sediment Supply, Sediment Transport, or Cross-shore Connectivity	1 + (shoreline armor removal length/500 ft); maximum score of 6	Armor dataset compiled by Kitsap County for restoration projects and shoreline length for protection projects
Tidal Flow	1 + (tidal inundation area/1 acre); maximum score of 6	PSNERP tidal wetland area (Simenstad et al. 2011) with interpretation of realistic project area based on infrastructure
Fish Passage	1	
	+	
	2 if there are no other barriers within the lowermost 650 ft of the creek	WDFW Fish Passage Barrier database and Wild Fish Conservancy Water Typing inventory of barriers.
	+	
	2 if the barrier is at creek mouth and (thus restricting access to entire estuary) and/or restricts the size of the estuary	Interpretation of aerial imagery
Other project types	1	

The project database is organized by parcel rather than by project. Projects that span multiple parcels will have a database entry for each parcel. Projects that span multiple parcels may have more than one project type, yet those project types may not be represented in each contributing, individual parcel. For the scoring of the size component, the total project size was used, rather than the size of the action on an individual parcel. The overall project score is the sum of the highest score assigned to each project type among all contributing parcels. For example, the score of a sediment supply and tidal flow restoration project that extends across three parcels will be the sum of the highest sediment supply score across all contributing parcels plus the highest tidal flow score across all contributing parcels. Ideally, one would compare projects in the database as they have been defined by their entire project extent.

It is recognized on a practical level that opportunities to implement projects do not always present themselves in their entirety, i.e., there may be landowner willingness for only one parcel out of a defined project extent of multiple parcels. The project database also includes scores for each parcel to show the relative benefits of the if the action was only conducted on that one parcel. The parcel scores are calculated separately from the project scores and apply the parcel-specific size data rather than the full project size. Similarly, calculations could be made for any subset of the parcels in the “project” by calculating the size based on participating parcels and applying it to the formula.

A user guide explaining the organization of the geodatabase is provided in Appendix B.

Several additional scoring parameters were considered but not included in the database due to incomplete or inconsistent information across the project area. Many of the data limitations were associated with information to characterize creek and estuary habitats, including water quality, water quantity, and sediment chemistry quality.

5.0 PRIORITIZATION FRAMEWORK RESULTS

5.1 Scoring Results

Scores of the 420 projects evaluated ranged from 1.1 to 197.7. Among all projects, the mean score was 24.4 and the median was 16.3. Only eight projects received scores greater than 100.

Figure 8 presents the rank of project scores from 1 to 420. A summary of the project scores, including the entries on process, suitability, structure and function, and size for each action type is provided in Appendix C. There tended to be a steep drop-off in scores among the top

projects, then a progressively more gradual slope among lower scores. The gradual slope indicates more projects with similar scores for the remainder of the project list.

As described in Section 4.2, project scores were calculated by computing the score of each of the project types contributing to the overall project. This allows for evaluation of the scores of each project type even among projects that address multiple project types. The scores of the benefits of individual project types ranged from 1.1 to 143.0. Figure 9 shows the scores assigned to each project type. Based on the average scores of each project type, protection projects tended to score higher than restoration projects of the same

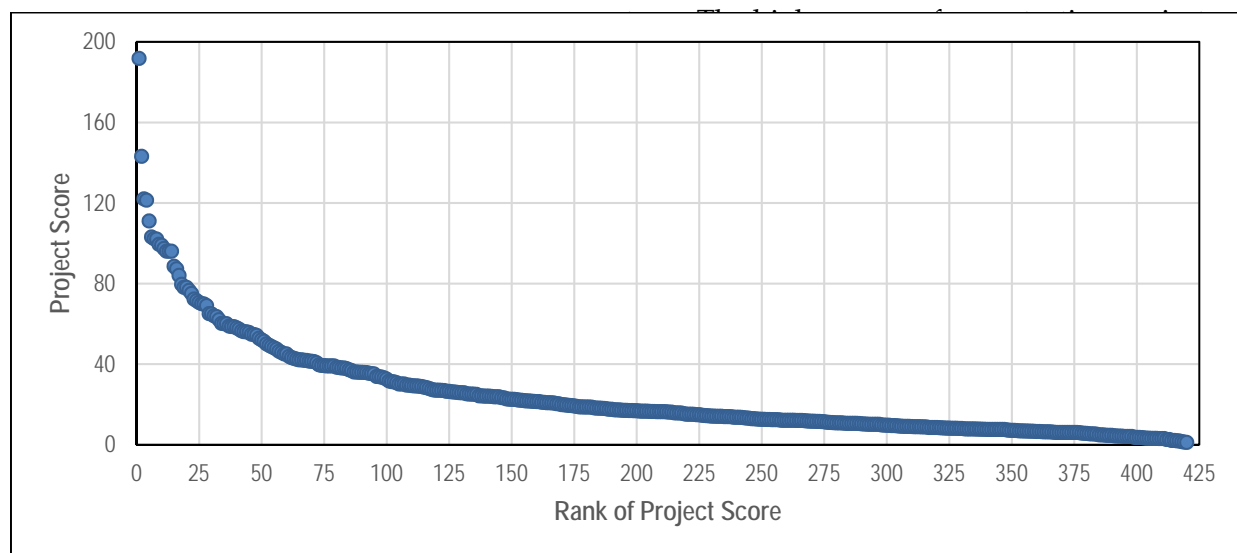


Figure 8. Project Scores Displayed by Ranking within Project Database

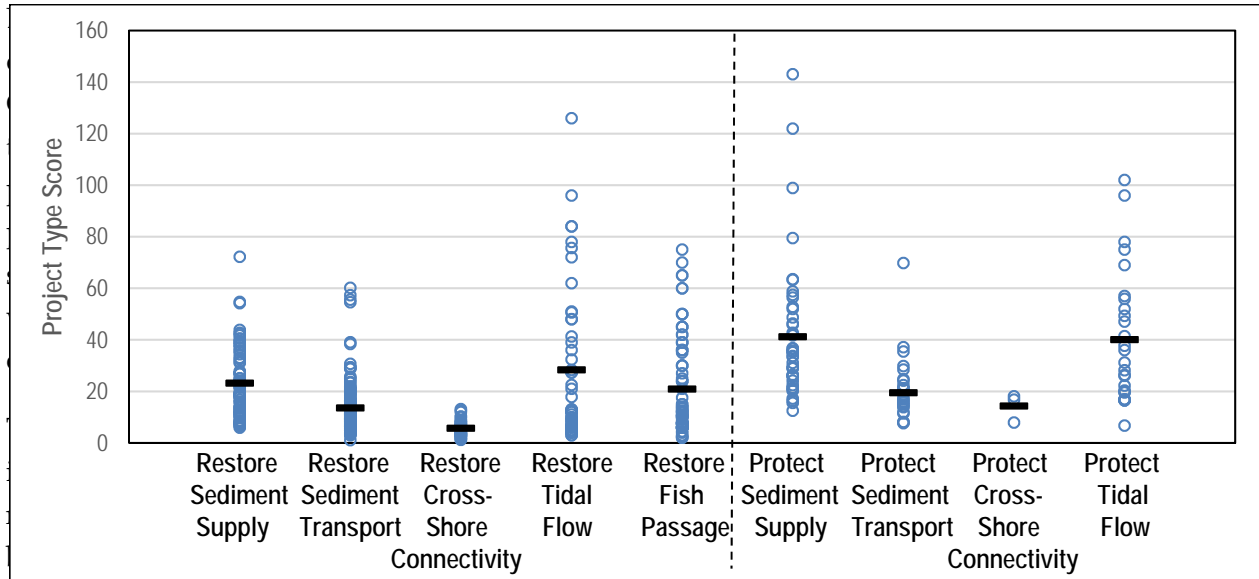


Figure 9. Individual Project Type Scores (circles) and Average Scores (bar) By Project Type
 For this reason, it is possible for a project to be on the list more than once.

Table 10. Name and Project ID Number of the Top 10 Projects of Each Project Type

Rank	Project Type		
	Sediment Supply Restoration	Sediment Transport Restoration	Cross-Shore Connectivity Restoration
1	North Kingston (2020)	North of Harper (2239)	Point No Point (2016)
2	North of Port Madison Creek at Manor Ln (2281)	Jackson Park (2163)	Annapolis Beach Park (2210)
3	Agate Point (2267)	Rolling Bay Walk (2285)	Gorst (2199)
4	Point Jefferson Boat Ramp (2034)	Blake Island State Park (2383)	Restoration Point (2322)
5	Skiff Point (2286)	North Marine Drive (2170)	Appletree Cove (2022)

6	West Dyes Inlet Chico (2145)	Suquamish (2042)	Pritchard Park (2312)
7	Manzanita (2361)	Crystal Springs Rd South (2336)	Silverdale at Bucklin Hill Rd (2131)
8	Northeast Port Madison at Euclid Ave (2277)	Enetai (2104)	Gilberton at Grahns Ln NE (2094)
9	NAD Marine Park (2164)	Country Club Rd and Area (2321)	East Rocky Point Bass Point (2179)
10	North of Sunny Cove (2255)	Sandy Hook (2050)	East Port Madison (2273)
Rank	Project Type		
	Tidal Flow Restoration	Fish Passage Restoration	Sediment Supply Protection
1	Point No Point (2016)	Sunny Cove Dr (south of Olalla) (2256)	N of Sandy Beach Ln (1021)
2	Bremerton Yacht Club (2186)	Brownsville (2089)	S of Sunrise Beach Dr (1020)
3	Rocky Point (2185)	Steele Creek (2091)	Loki Bluff Dr (1010)
4	Harper Estuary (2240)	Chico (2153)	West Foulweather Bluff (1001)
5	Olalla at Crescent Valley Rd SE (2254)	Annapolis Beach Park (2212)	South of Rose Point (1016)
6	Silverdale at Mickleberry Rd (2130)	Cooper Creek (head of Eagle Harbor) (2304)	South of Command Point (1063)
7	Little Clam Bay (2224)	Wright Creek on north side of Sinclair Inlet (2198)	East Foulweather Bluff (1004)
8	South Foulweather Bluff at Beach Cabin Wy (2002)	Beach Dr (2217)	Newellhurst Creek (1028)
9	Beaver Creek (2223)	Point No Point (2016)	Eglon (1015)
10	Rose Pt (2019)	Tie between West Dyes Inlet South Chico Way NW (2143) and Duncan Creek (2228)	N of Fragaria (1061)
Rank	Project Type		
	Sediment Transport Protection	Cross-shore Connectivity Protection	Tidal Flow Protection
1	N of Anderson Point County Park (1064)	Point Monroe Lagoon (1090)	Manzanita Creek (1077)
2	Battle Point Light (1081)	Port Blakely (1086)	Murden Creek (1087)
3	South of Command Point (1063)	Manzanita Bay at NE Bayview Blvd (1078)	Point Jefferson (1030)
4	East Port Madison at Euclid Ave (1091)	n/a	West side mouth of Miller Bay (1042)
5	North of Manzanita Creek (1076)	n/a	Burke Bay (1046)
6	East Foulweather Bluff (1005)	n/a	Apple Cove Point (1024)
7	Fletcher Bay (1084)	n/a	Fletcher Bay (1083)
8	North of Fragaria Creek (1059)	n/a	Embayment near Chico (1049)
9	Southworth (1053)	n/a	West Rocky Point South Mud Bay (1051)

10	North of Fragaria Creek (1060)	n/a	Olalla Creek at Olalla Valley Rd (1067)
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5.2 Prioritization of Projects Based on Framework Scores

The framework scores were used to prioritize projects into tiers based on anticipated benefits to juvenile Chinook salmon. Targeting four tiers of project priorities, there were no clear breaks for differentiating prioritization categories. Projects were divided into four tiers of priority: 1 (highest), 2, 3, and 4. The top 50 scores were assigned to Tier 1 with the remaining 370 projects divided evenly among Tiers 2, 3, and 4. Fewer projects were assigned to Tier 1 so that it is a small, select subset of the most beneficial projects. The number of projects in Tier 1 was intended to be large enough to provide several project opportunities to pursue implementation while recognizing that some of the most beneficial projects may have feasibility challenges that may prevent implementation in the near future. The Tier 1 project scores range between 52.0 and 191.7. The Tier 1 projects are listed in Table 11 and mapped in Figure 10.

Tier 2 project scores range between 19.4 and 51.3. The Tier 2 projects are listed in Table 12 and mapped in Figure 11. Tier 3 project scores range between 10.0 and 19.3. The Tier 3 projects are listed in Table 13 and mapped in Figure 12. Tier 4 project scores range between 1.1 and 9.7. The Tier 4 projects are listed in Table 14 and mapped in Figure 13.

Table 11. Tier 1 Priority Projects

Tier 1 Project Name	Action Type(s)	Project ID	Rank	Score
Point No Point	Rest-ST-XS-TF-FP	2016	1	191.7
N of Sandy Beach Ln	Prot-SS	1021	2	143.0
S of Sunrise Beach Dr	Prot-SS	1020	3	121.9
Harper Estuary	Rest-ST-FP-TF	2240	4	121.3
Little Clam Bay	Rest-FP-TF	2224	5	111.0
Beaver Creek	Rest-ST-FP-TF	2223	6	103.0
Brownsville	Rest-ST-TF	2089	7	102.2
Manzanita Creek	Prot-TF	1077	8	102.0
South of Command Point	Prot-SS-ST	1063	9	99.4
Loki Bluff Dr	Prot-SS	1010	10	98.9
Olalla at Crescent Valley Rd SE	Rest-ST-TF	2254	11	97.3
Murden Creek	Prot-TF	1087	12	96.0
Bremerton Yacht Club	Rest-TF	2186	13	96.0
Silverdale at Mickleberry Rd	Rest-ST-TF	2130	14	96.0
West Foulweather Bluff	Prot-SS	1001	15	90.8
Sunny Cove Dr (south of Olalla)	Rest-FP-TF	2256	16	87.2
Rocky Point	Rest-TF	2185	17	84.0
South of Rose Point	Prot-SS	1016	18	79.5
Steele Creek	Rest-FP	2091	19	78.0
Eglon	Rest-SS, Prot-SS	1015	20	76.5

Tier 1 Project Name	Action Type(s)	Project ID	Rank	Score
Point Jefferson	Prot-TF	1030	21	75.0
North Kingston	Rest-SS	2020	22	72.2
Battle Point Light	Prot-ST-TF	1081	23	71.4
Rose Pt	Rest-ST-TF	2019	24	70.6
N of Fragaria	Prot-SS-ST	1061	25	69.9
N of Anderson Point County Park	Prot-ST	1064	26	69.8
Beach Dr at Sacco	Rest-ST-FP-TF	2214	27	68.5
Chico	Rest-FP	2153	28	65.0
Apple Cove Point	Rest-ST, Prot-TF	1024	29	64.8
South of President Point	Rest-SS-TF	2033	30	63.9
East Foulweather Bluff	Prot-SS	1004	31	63.5
South Foulweather Bluff at Beach Cabin Wy	Rest-TF	2002	32	62.0
West side mouth of Miller Bay	Prot-TF	1042	33	55.9
North of Harper	Rest-ST	2239	34	60.2
Burke Bay	Prot-TF	1046	35	69.0
Annapolis Beach Park	Rest-FP	2212	36	60.0
Cooper Creek (head of Eagle Harbor)	Rest-FP	2304	37	60.0
Newellhurst Creek	Prot-SS	1028	38	58.8
West Rocky Point South Mud Bay	Prot-ST-TF	1051	39	58.5
Finn Creek	Rest-FP-TF	2015	40	58.5
Keyport	Rest-ST-TF	2088	41	58.0
Jackson Park	Rest-ST	2163	42	57.3
Wright Creek on north side of Sinclair Inlet	Rest-FP-TF	2198	43	56.0
Rolling Bay Walk	Rest-ST	2285	44	55.6
North of Port Madison Creek at Manor Ln	Rest-SS	2281	45	54.7
Blake Island State Park	Rest-ST	2383	46	54.6
Agate Point	Rest-SS	2267	47	54.2
South of Illahee State Park Ridgeview Dr	Prot-SS	1048	48	52.8
Fletcher Bay	Prot-TF	1083	49	52.0
East Foulweather Bluff	Prot-SS-ST	1005	50	51.3

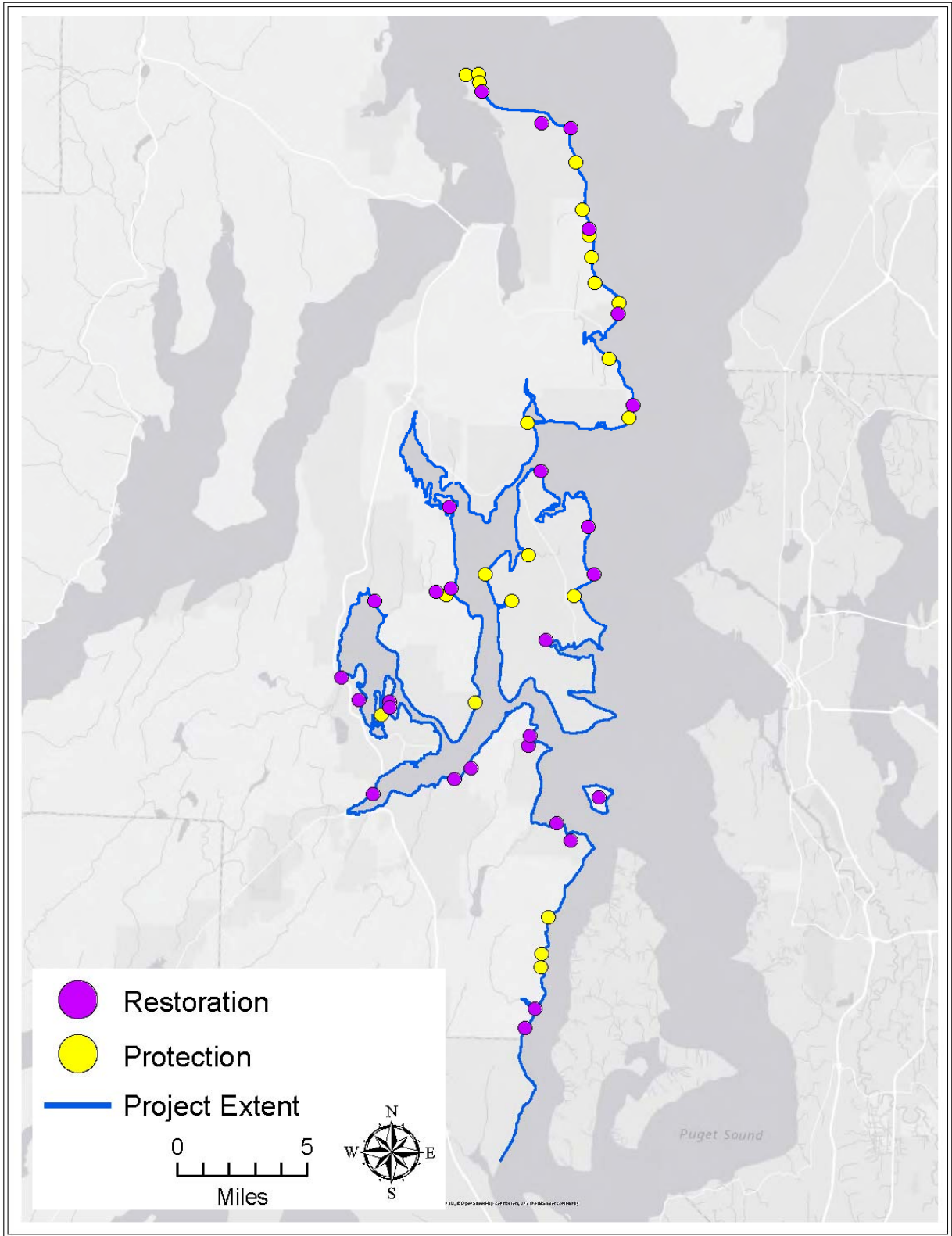


Figure 10. Distribution of West Sound Tier 1 Priority Projects

Table 12. Tier 2 Priority Projects

Tier 2 Project Name	Action Type(s)	Project ID	Rank	Score
Embayment near Chico	Prot-TF	1049	51	78.0
Beach Dr	Rest-FP	2217	52	50.0
Point Jefferson Boat Ramp	Rest-SS	2034	53	42.7
Foulweather Bluff	Prot-SS	1002	54	48.7
West of Norwegian Point	Rest-TF	2014	55	48.0
Ross Creek	Rest-TF	2203	56	47.3
Foulweather Bluff	Prot-SS	1003	57	46.4
Wilson Cr Rd SE South of Southworth	Prot-SS-ST	1055	58	45.7
West Dyes Inlet South Chico Way NW	Rest-FP	2143	59	45.0
Duncan Creek	Rest-FP	2228	60	45.0
Skiff Point	Rest-SS	2286	61	43.8
Silver Creek at Eglon	Rest-ST-TF	2018	62	43.1
West Dyes Inlet Chico	Rest-SS	2145	63	42.3
Cowling Creek at Miller Bay Rd	Rest-FP	2040	64	30.0
Murden Creek at State Hwy 305 NE	Rest-FP	2289	65	42.0
North Fletcher Bay Creek	Rest-FP	2348	66	42.0
Manzanita	Rest-SS	2361	67	41.8
Prospect Point North	Prot-SS	1065	68	41.7
Olalla Creek at Olalla Valley Rd	Prot-TF	1067	69	41.4
President Pt embayment	Rest-TF	2031	70	41.3
Pilot Point North	Prot-SS-ST	1011	71	41.2
Northeast Port Madison at Euclid Ave	Rest-SS	2277	72	40.6
NAD Marine Park	Rest-SS	2164	73	39.5
North of Sunny Cove	Rest-SS	2255	74	39.2
North of Manzanita on Henderson Rd NE	Rest-SS	2363	74	39.2
North Marine Drive	Rest-ST	2170	76	39.0
Crabapple Creek	Rest-FP	2025	76	39.0
Southeast Lemolo Sam Snyder Creek	Rest-FP	2055	76	39.0
South Manitou Beach	Rest-TF	2288	76	39.0
Suquamish	Rest-ST	2042	80	38.4
Westwood	Rest-SS-ST	2339	81	38.2
North of Manzanita at Silven Ave NE	Rest-SS	2362	82	38.0
Arbor Fund	Rest-SS	2268	82	38.0
Northwest Miller Bay	Prot-TF	1039	84	37.7
Manitou Beach	Rest-SS	2287	85	37.1
Central Sunrise Beach	Prot-SS	1018	86	36.7
Mac's Dam Creek	Rest-FP	2317	87	36.0
Kitsap Creek at Kingston St	Rest-FP	2372	87	36.0
North of Port Madison Creek at Sunrise Bluff Ln	Rest-SS	2280	89	35.9
Enetai	Rest-ST-TF	2104	90	35.8

North Skunk Bay at Twin Spits Rd	Prot-SS	1006	91	35.7
South Sunrise Beach	Prot-SS	1019	92	35.6
Rolling Bay	Prot-SS	1089	93	35.3
Olalla Creek	Prot-TF	1068	94	28.2
North Sunrise Beach	Prot-SS	1017	95	35.2
Westwood	Rest-SS-ST	2340	96	35.0
Carpenter Cr estuary	Prot-TF	1027	97	49.3
Southworth	Prot-SS-ST	1053	98	33.8
NE Marine View Dr	Prot-SS	1031	99	33.7
NE Marine View Dr	Prot-SS	1032	100	33.4
North Kingston	Rest-SS	2021	101	33.1
Fragaria	Rest-SS	2249	102	32.5
West of Doe-Keg-Wats at NE Shore Dr	Rest-SS	2035	103	31.5
Grovers Creek	Prot-TF	1038	104	31.2
North of Manzanita on Henderson Rd NE	Rest-SS	2364	105	31.0
Crystal Springs Rd South	Rest-ST	2336	106	30.7
Little Scandia Creek at NW Scandia Rd	Rest-FP	2079	107	30.0
Ravine Creek	Rest-FP	2315	108	30.0
West Miller Bay Sid Price Rd	Rest-XS, Prot-TF	1040	109	29.5
Pilot Point South	Prot-SS	1013	110	29.5
Country Club Rd and Area	Rest-ST	2321	111	29.2
East of Indianola at NE Shore Dr	Prot-SS	1033	112	29.1
Sandy Hook	Rest-ST	2050	112	29.0
Skunk Bay at Hood Canal Dr	Prot-SS	1008	114	29.0
Illahee State Park	Rest-ST	2103	115	28.8
East Port Madison at Euclid Ave	Prot-ST	1091	116	28.5
South of Command Point	Rest-SS	2251	117	27.9
Point White Dr	Rest-TF	2335	118	27.4
Dogfish Bay Daniels Creek	Rest-FP	2086	119	27.0
Jefferson Pt. Rd	Rest-SS	2030	120	26.9
South of Driftwood Cove View Park	Rest-SS	2246	120	26.9
Port Orchard Bay	Rest-SS	2096	120	26.9
Lebo	Rest-SS-ST-FP	2117	123	26.8
Southeast Lemolo North of Sam Snyder Creek	Prot-TF	1043	124	26.4
Pilot Point at Pilot Point Rd	Prot-SS	1014	124	26.4
Sandy Beach Ln	Prot-SS	1022	126	26.2
North Skunk Bay at Twin Spits Rd	Prot-SS	1007	127	26.0
Blakely Harbor	Rest-FP-TF	2318	128	26.0
End of NE Day Rd East	Prot-SS	1088	129	25.9
North of Sandy Hook	Rest-SS-ST	2049	130	25.7
Windy Point	Rest-ST	2126	130	25.7
Johnson Creek	Rest-ST-TF	2073	130	25.7

South Erlands Point at NW Paul Benjamin Rd	Rest-ST	2162	133	25.2
Port Madison	Rest-SS	2269	134	25.1
Illahee Creek	Rest-FP	2098	135	25.0
North of COBI Ferry Dock	Rest-SS	2295	135	25.0
South of Driftwood Cove Jodyann Ct	Rest-ST	2247	137	24.9
Skunk Bay at Bear Berry Pl NE	Prot-SS	1009	138	24.2
North of Port Madison Creek at NE Puget Bl Ln	Rest-SS	2279	139	24.1
East Lemolo Shore Dr NE	Rest-FP	2060	140	24.0
Bjorgen Creek	Rest-FP	2062	140	24.0
Enetai Creek	Rest-FP	2108	140	24.0
Dogfish Bay SR 308	Rest-FP-TF	2084	143	23.8
Agate Point	Rest-SS	2266	144	23.7
Indianola at Madrona St NE	Rest-SS	2036	144	23.7
Lemolo Fjord Dr NE	Rest-ST	2066	144	23.7
West Dyes Inlet Chico	Rest-ST	2142	147	23.3
Evergreen Park	Rest-ST-XS	2195	148	23.1
Washington Avenue	Rest-SS	2196	149	22.7
Annapolis Olney Creek and Karcher Creek at Beach Dr	Rest-TF	2390	150	22.5
North of Manzanita Creek	Prot-ST	1076	151	22.4
Pilot Point Central	Prot-SS	1012	151	22.4
Oyster Bay	Prot-TF	1050	153	22.3
Skunk Bay at Blackmouth Pl	Rest-SS	2004	154	21.9
North of Big Scandia Creek	Rest-ST	2077	155	21.7
West Bainbridge South of Bridge	Rest-SS	2366	156	21.6
Port Madison Creek	Rest-SS	2282	157	21.5
Colvos Passage Kitsap	Prot-SS	1070	158	21.4
Fletcher Bay	Prot-ST	1084	158	21.4
North of Fragaria Creek	Prot-ST	1059	160	21.3
Colvos Passage Kitsap	Prot-SS	1071	160	21.3
Newellhurst Creek	Rest-TF	2026	162	21.0
South of Johnson Creek	Rest-ST	2076	163	20.9
Colvos Passage	Prot-SS	1056	164	20.7
West Bainbridge Hansen Rd NE	Rest-SS-ST	2343	164	20.7
Silverdale at Bucklin Hill Rd	Rest-XS-TF	2131	164	20.7
Point Monroe Lagoon	Prot-XS	1090	167	20.6
South of Driftwood Cove Goat Trail Rd	Rest-ST	2248	167	20.6
South of Jefferson Point	Prot-SS	1029	169	20.2
Wilson Creek	Prot-TF	1058	170	19.8
Newberry Hill	Rest-SS	2138	171	19.7
Olalla Bay South	Prot-TF	1069	172	19.6
Old Man House Suquamish North	Rest-ST	2043	173	19.4
West Mud Bay at Fitz Dr	Rest-ST	2173	156	21.6

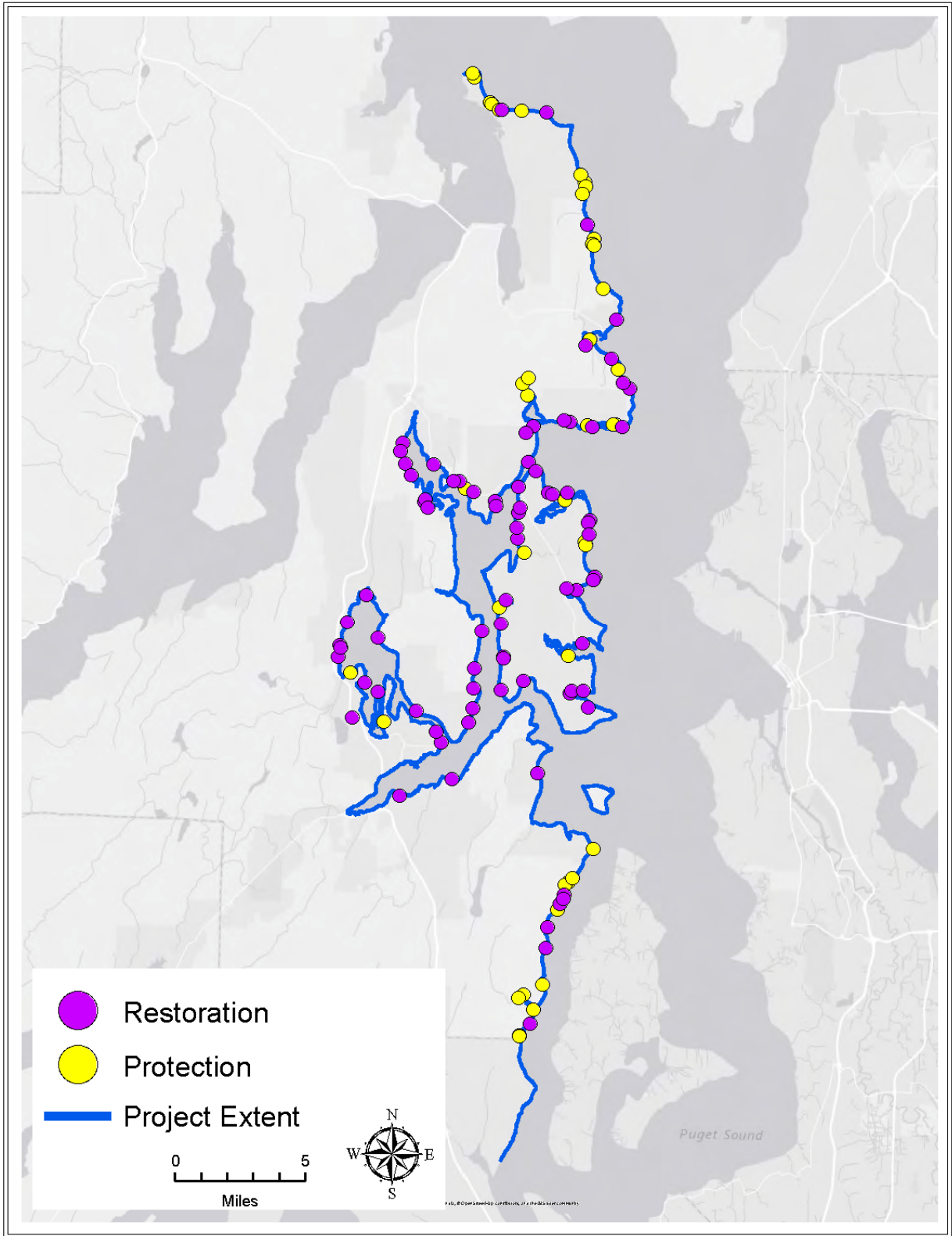


Figure 11. Distribution of West Sound Tier 2 Priority Projects

Table 13. Tier 3 Priority Projects

Tier 3 Project Name	Action Type(s)	Project ID	Rank	Score
North of Windy Point	Rest-SS	2127	174	19.3
West of Buck Lake Outlet	Rest-SS	2010	175	19.2
West Mud Bay at Fitz Dr	Rest-ST	2173	176	18.9
East Park	Rest-SS	2116	177	18.9
West Bainbridge Henderson Rd NE	Rest-SS	2365	178	18.7
North of Sunrise Beach	Rest-ST-TF	2263	179	18.7
Skunk Bay East of Prospect St	Rest-SS	2007	180	18.6
Tracyton Mosher Creek	Rest-ST	2119	181	18.6
Skunk Bay West of Prospect St	Rest-SS	2006	182	18.6
Jefferson Pt. Rd	Rest-SS	2029	183	18.5
Lemolo Shore Dr NE	Rest-ST	2065	184	18.2
North Eglon	Rest-SS	2017	185	18.1
South Beach	Rest-SS	2330	186	17.9
Skunk Bay West of Florence St NE	Rest-SS	2009	187	17.9
West of Kitsap Creek	Rest-ST	2038	188	17.7
west side of Miller Bay	Rest-FP	2373	189	17.5
North of Fragaria Creek	Prot-ST	1060	190	17.5
North of Enetai Creek	Rest-ST	2105	191	17.2
North of Wilson Creek	Prot-SS	1057	192	17.2
Gilberton at Grahns Ln NE	Rest-XS-TF	2094	193	17.1
Gorst	Rest-TF-XS	2199	194	17.0
West Miller Bay Sid Price Rd	Prot-TF	1041	195	16.9
West Miller Bay Miller Bay Rd	Prot-TF	1092	196	16.9
Sandy Hook Rd	Rest-ST	2051	197	16.9
North of Olalla	Prot-ST	1066	198	16.8
Port Blakely	Prot-XS	1086	199	16.8
East Park	Rest-SS	2115	200	16.8
South Colby	Rest-SS-ST	2237	201	16.6
East Miller Bay Seacrest Ave NE	Prot-TF	1035	202	16.5
East Miller Bay South Lera Ln	Prot-TF	1036	203	16.5
East Miller Bay North Lera Ln	Prot-TF	1037	204	16.5
North Gazzam Preserve Shoreline North	Rest-ST	2342	205	16.5
East of Indianola at NE Shore Dr	Prot-SS	1034	206	16.4
Newberry Hill Koch Creek Shoreline	Rest-ST-TF	2133	207	16.4
Port Madison at Broom St	Rest-ST	2271	208	16.3
US Navy at Orchard Point	Rest-ST-XS	2225	209	16.3
West of Kitsap Creek at NE Seaview Ave	Rest-ST	2039	210	16.3
West Chico Bay	Rest-ST	2149	211	16.2
SE Olympiad Dr	Rest-ST-FP	2242	212	16.1
North of Apple Cove Point	Prot-ST	1023	213	16.1

Tier 3 Project Name	Action Type(s)	Project ID	Rank	Score
West Hansville	Rest-SS	2011	214	15.7
Pleasant Ln NE Rd End	Prot-ST	1093	215	15.7
Prospect Point	Rest-ST	2252	216	15.7
South of Illahee State Park	Prot-SS	1047	217	15.5
Upper Eagle Harbor	Rest-XS-FP	2305	218	15.2
Viking Way	Rest-FP	2074	219	15.0
Newberry Hill Koch Creek at Chico Way	Rest-FP	2134	220	15.0
Beach Dr South	Rest-FP-TF	2215	221	15.0
Port Madison at Gordon Dr NE	Rest-ST-TF	2270	222	14.8
East of Harper	Rest-ST	2241	223	14.7
Gilberton	Rest-ST-XS	2095	224	14.5
Bjorgen Creek	Rest-ST-TF	2061	225	14.4
West Rocky Point	Prot-ST	1052	226	14.3
NE Port Madison at Washington Ave NE South	Rest-ST	2274	227	14.2
North Erlands Point	Rest-ST	2158	228	14.1
Tracyton, Dyes	Rest-SS	2125	229	14.1
Carpenter Cr estuary	Prot-TF	1026	230	14.0
North of Curley Creek	Rest-ST-TF	2234	231	14.0
Issei Creek (Fletcher Bay)	Rest-FP	2346	232	14.0
WF Issei Creek (Fletcher Bay)	Rest-FP	2349	233	14.0
North Gazzam Preserve Shoreline	Prot-ST	1085	234	13.9
Jefferson Point	Rest-SS	2027	235	13.8
Northwest Mud Bay	Rest-ST	2172	236	13.8
Command Point	Rest-ST	2250	237	13.8
South of Jefferson Point	Rest-SS	2028	238	13.8
Thompson-Kleabel Creek	Rest-SS	2047	239	13.5
Winslow Ave	Rest-FP	2297	240	13.5
Northwest Miller Bay	Rest-FP	2375	241	13.5
Tracyton	Rest-ST	2118	242	13.5
NE Port Madison at Washington Ave NE North	Rest-ST	2276	243	13.3
West of unnamed creek East of Bjorgen Creek	Rest-ST-TF	2058	244	13.1
Lemolo Johnson Way NE	Rest-ST-XS	2064	245	13.1
West of Hawley Creek	Rest-ST	2294	246	12.8
Silverdale at Tracyton Blvd	Rest-ST	2129	247	12.8
West Rocky Point NW Swiftshore CT	Rest-ST	2177	248	12.7
Annapolis Beach Park	Rest-XS	2210	249	12.5
Whiskey Creek	Rest-FP	2311	250	12.5
Battle Point North at Olallie Ln NE	Prot-SS	1079	251	12.5
Southside Port Washington Narrows 19th St	Rest-SS	2191	252	12.4
Beach Dr Waterman	Rest-TF	2218	253	12.4
North of Jefferson Point	Rest-ST	2370	254	12.4
Olympus Beach Rd NE	Rest-SS	2350	255	12.3

Tier 3 Project Name	Action Type(s)	Project ID	Rank	Score
North Eagle Harbor Community Center	Rest-ST	2300	256	12.3
Southeast Lemolo North of Sam Snyder Creek	Rest-ST-TF	2056	257	12.3
East Bay Street	Rest-ST	2209	258	12.0
Newberry Hill Koch Creek	Rest-FP	2135	259	12.0
West Dyes Inlet Hwy 3	Rest-FP	2144	260	12.0
Anderson Creek	Rest-FP	2200	261	12.0
Peterson Hill Rd NE	Rest-FP	2356	262	12.0
South of Point Richmond	Rest-TF	2384	263	12.0
Fragaria	Prot-ST	1062	264	11.9
Little Scandia Creek at NW Lindquist Ln	Rest-ST	2080	265	11.9
West of Agate Point	Rest-SS	2367	266	11.9
South Foulweather Bluff Skunk Bay Rd	Rest-ST	2001	267	11.8
North of Southworth at SE Bean Rd	Rest-SS	2243	268	11.7
East Rocky Point NW Sparrow Wy	Rest-ST	2182	269	11.6
Pearson Point	Rest-ST	2083	270	11.6
East Rocky Point	Rest-ST	2183	271	11.6
South Foulweather Bluff	Rest-ST	2003	272	11.5
NE Port Madison at Washington Ave NE Mid	Rest-ST	2275	273	11.5
North Marine Drive	Rest-ST	2171	274	11.4
North of Illahee State Park at Loretta Ln	Rest-ST	2101	275	11.3
Tracyton Vanishing Way	Rest-ST	2120	276	11.0
Manzanita	Rest-ST	2359	277	11.0
Manchester	Rest-ST	2226	278	10.9
South Beach	Rest-ST	2331	279	10.8
Little Scandia Creek Eastern Point	Rest-ST	2078	280	10.8
Old Man House Suquamish at Angeline Ave S	Rest-SS	2045	281	10.8
Old Man House Suquamish at NE McKinstry St	Rest-ST	2044	282	10.7
North of Tracyton	Rest-SS	2122	283	10.5
Lafayette Ave	Rest-FP	2278	284	10.5
Sportsmans Club Creek	Rest-FP	2302	285	10.5
Foster Rd	Rest-FP	2344	286	10.5
Skunk Bay at NE Admiralty Wy	Rest-FP	2385	287	10.5
Point Bolin	Rest-ST	2054	288	10.5
Yukon Harbor	Rest-SS	2236	289	10.4
Restoration Point	Rest-XS	2322	290	10.2
South of Johnson Creek	Rest-ST	2075	291	10.2
Murden Cove at Green Spot PI NE	Rest-ST	2290	292	10.1
Northeast Chico Bay	Rest-ST	2157	293	10.1
Pearson Point Rd NE	Rest-TF	2082	294	10.0
NE Country Club Rd	Rest-FP	2319	295	10.0
South Beach Chester Street	Rest-FP	2329	296	10.0
Appletree Cove	Rest-XS	2022	297	10.0

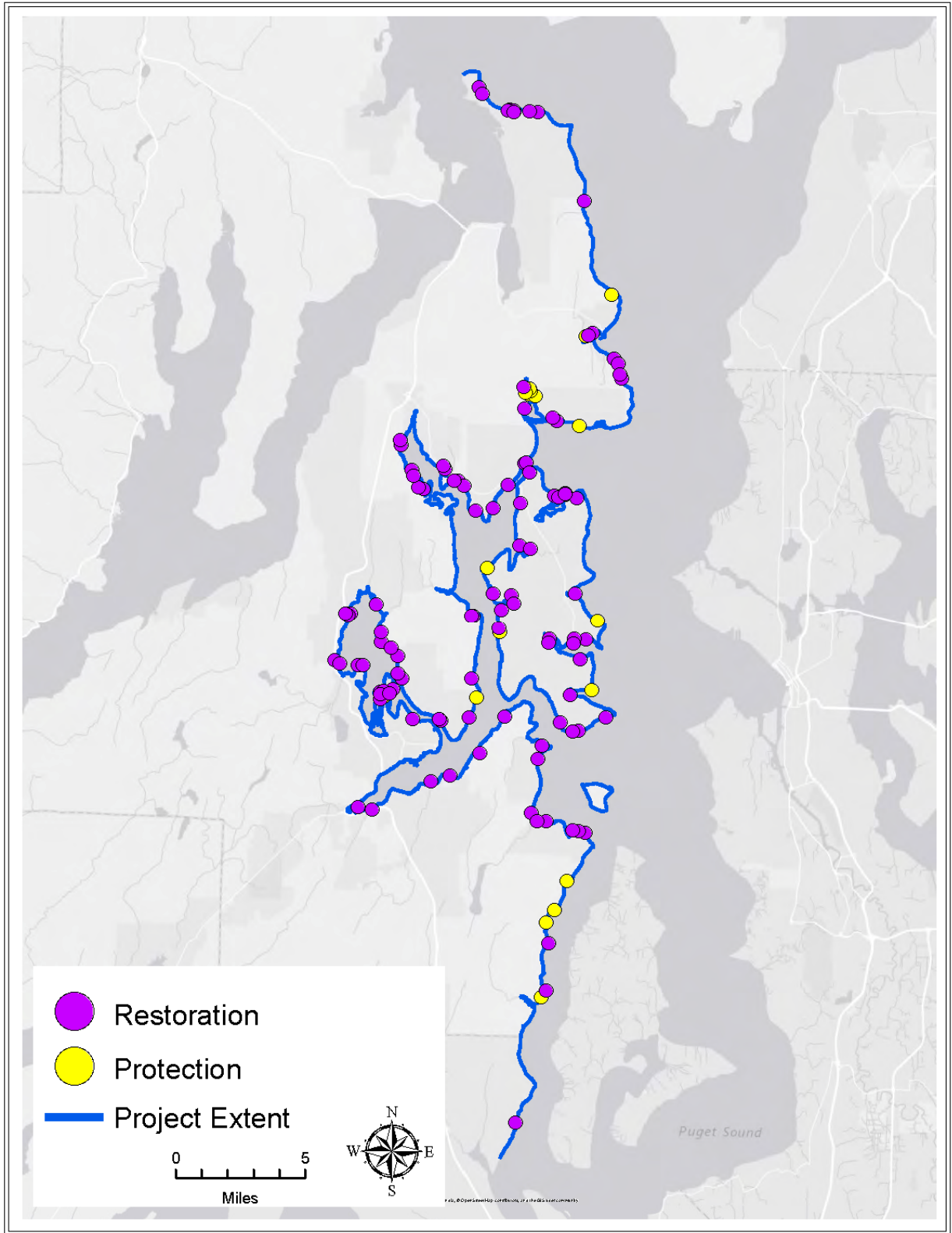


Figure 12. Distribution of West Sound Tier 3 Priority Projects

Table 14. Tier 4 Priority Projects

Tier 4 Project Name	Action Type(s)	Project ID	Rank	Score
Manzanita Bay at NE Bergman Rd	Rest-SS	2358	298	9.7
East Rocky Point NW Chrey Ln	Rest-ST	2184	299	9.6
Southeast Lemolo NE Holman Rd	Rest-ST	2057	300	9.6
North of Tracyton	Rest-ST	2121	301	9.6
South Beach East	Rest-ST	2326	302	9.4
Manchester	Rest-ST	2227	303	9.4
Blakely Harbor	Rest-ST	2316	304	9.3
Presidents Point	Rest-ST	2032	305	9.1
South Beach Beans Bight Rd East	Rest-ST	2324	306	9.0
West Dyes Inlet North Chico Way NW Woods Creek	Rest-FP	2139	307	9.0
Puget Sound Naval Shipyard	Rest-TF-XS	2197	308	9.0
Skunk Bay at Kincaid Ave NE	Rest-ST	2005	309	9.0
South of Windy Point	Rest-ST	2124	310	8.9
Wing Point	Rest-ST	2292	311	8.8
North of Illahee	Rest-SS	2097	312	8.8
East Hansville	Rest-ST	2013	313	8.8
Pritchard Park	Rest-XS	2312	314	8.7
Old Man House Suquamish at Angeline Ave South	Rest-ST	2046	315	8.7
Silverdale at McConnell	Rest-ST	2132	316	8.5
North of Illahee State Park at Rue Villa NE	Rest-ST	2099	317	8.4
Hansville	Rest-ST	2012	318	8.4
Liberty Bay	Rest-ST	2071	319	8.4
North Gazzam Preserve Shoreline North	Rest-SS	2341	320	8.3
Point Bolin	Rest-ST	2052	321	8.2
South Port Washington Narrows Thompson Dr	Rest-SS	2192	322	8.2
Battle Point North	Prot-ST	1080	323	8.1
North of Driftwood Cove	Prot-ST	1054	324	8.1
Enetai South Jacobson Blvd	Rest-ST	2112	325	8.0
West Dyes Inlet Chico Way NW	Rest-FP	2148	326	8.0
Annapolis Olney Creek Arnold Ave	Rest-FP	2211	327	8.0
Manzanita Bay at NE Bayview Blvd	Prot-XS	1078	328	7.9
South Erlands Point at Tanda Ave NW	Rest-ST	2161	329	7.8
East Rocky Point Bass Point	Rest-XS	2179	330	7.7
East Port Madison	Rest-XS	2273	331	7.7
South of Enetai Creek	Rest-ST	2109	332	7.7
Gilberton at Arizona St	Rest-SS	2093	333	7.7
South of Battle Point North of Tolo Rd	Prot-ST	1082	334	7.6
East of unnamed creek East of Bjorgen Creek	Rest-ST	2059	335	7.6
North of Battle Point	Rest-ST	2352	336	7.6

Tier 4 Project Name	Action Type(s)	Project ID	Rank	Score
Lemolo Jacobson Rd	Rest-SS	2063	337	7.5
Kingfisher Creek (Kingston)	Rest-FP	2023	338	7.5
Kingfisher Creek (Kingston)	Rest-FP	2024	339	7.5
South of Brownsville	Rest-FP	2092	340	7.5
Woods Creek	Rest-FP	2140	341	7.5
Sunrise Drive NE	Rest-FP	2284	342	7.5
Cougar Creek	Rest-FP	2306	343	7.5
Eagle Harbor Drive	Rest-FP	2308	344	7.5
South Eagle Harbor at Rose Lp	Rest-FP	2309	345	7.5
West Mud Bay at Marine Drive	Rest-ST	2174	346	7.4
Enetai North Jacobson Blvd	Rest-ST	2110	347	7.3
South Port Washington Narrows Chester Ave	Rest-SS	2193	348	7.1
South Erlands Point	Rest-XS	2159	349	7.0
Enetai North Jacobson Blvd	Rest-ST	2111	350	7.0
North of Southworth Ferry Dock	Rest-ST	2245	351	6.9
Southside Port Washington Narrows 18th St	Rest-SS	2194	352	6.8
Johnson Creek	Prot-TF	1044	353	6.8
South Beach Beans Bight Rd West	Rest-XS	2325	354	6.7
South Port Washington Narrows Snyder Ave	Rest-SS	2190	355	6.7
West Mud Bay at Marine Drive	Rest-ST	2175	356	6.7
Northwest Marine Drive	Rest-ST	2169	357	6.6
West Marine Drive	Rest-SS	2168	358	6.6
East Rocky Point	Rest-ST	2181	359	6.5
West Port Madison	Rest-XS	2272	360	6.5
South Beach East	Rest-ST	2327	361	6.5
North of Illahee State Park at NE Steinman Ln	Rest-ST	2102	362	6.4
East Rocky Point NW Drury Ln	Rest-ST	2180	363	6.3
North of Illahee State Park at Rue Villa NE	Rest-ST	2100	364	6.3
South Erlands Point at Tanda Ave NW	Rest-ST	2160	365	6.3
Phinney Bay	Rest-XS	2187	366	6.2
Phinney Bay	Rest-XS	2188	367	6.0
Cowling Creek hatchery	Rest-FP	2041	368	6.0
Poulsbo Fish Park	Rest-FP	2069	369	6.0
Port Orchard Blvd	Rest-FP	2206	370	6.0
North of Waterman Point	Rest-FP	2220	371	6.0
Toe Jam Hill Rd	Rest-FP	2328	372	6.0
Crystal Springs Rd North	Rest-FP	2338	373	6.0
Miemois Creek in Manzanita Bay	Rest-FP	2354	374	6.0
SR 304 Ramp	Rest-FP	2380	375	6.0
Beach Dr	Rest-FP	2387	376	6.0
Southside Port Washington Narrows High Ave	Rest-SS	2378	377	5.9
South of Battle Point and Tolo Rd	Rest-ST	2351	378	5.7

Tier 4 Project Name	Action Type(s)	Project ID	Rank	Score
Enetai South Jacobson Blvd	Rest-ST	2113	379	5.6
North of Southworth at Tola Rd	Rest-ST	2244	380	5.5
Liberty Bay	Rest-XS	2070	381	5.4
Restoration Pt	Rest-XS	2323	382	5.2
Chico Bay Erlands Point Rd	Rest-XS	2156	383	5.2
Colchester at E Pheasant Hill Ln	Rest-ST	2231	384	5.1
Colchester at SE Ofarrell Ln	Rest-ST	2232	385	4.8
Colchester at Prichard Rd E	Rest-ST	2229	386	4.8
Colchester at SE Cammer Rd	Rest-ST	2233	387	4.7
unnamed near Do Kag Watts	Rest-TF	2037	388	4.5
Manchester State Park	Rest-XS	2222	389	4.5
Northeast Miller Bay	Rest-FP	2374	390	4.5
Southwest Mud Bay at The Cedars	Rest-XS	2176	391	4.3
Puget Sound Naval Shipyard	Rest-XS	2379	392	4.2
West of Keyport	Rest-ST	2087	393	4.2
Pleasant Beach	Rest-ST	2334	394	4.1
Wilson Creek	Rest-TF	2238	395	4.0
NE Lofgren Road	Rest-FP	2291	396	4.0
West Kingston Rd	Rest-TF	2388	397	4.0
Chico Bay Kitsap County Parks	Rest-XS	2151	398	4.0
South Eagle Harbor at Harbor Pl	Rest-XS	2307	399	3.6
Pleasant Beach	Rest-ST	2333	400	3.5
Colchester at E Perelli Ln	Rest-ST	2230	401	3.5
West Chico Bay	Rest-ST	2150	402	3.4
West Dogfish Bay Larm Rd NE	Rest-ST	2085	403	3.2
North Eagle Harbor	Rest-XS	2301	404	3.1
South of Water St	Rest-XS	2207	405	3.1
North of Water St	Rest-XS	2208	406	3.0
South Beach Drive	Rest-TF	2213	407	3.0
Fort Ward State Park	Rest-FP	2332	408	3.0
Southside Port Washington Narrows	Rest-XS	2189	409	3.0
East Rocky Point Bass Point	Rest-XS	2178	410	3.0
North of Curley Creek	Rest-ST	2235	411	2.9
Ravine Creek	Rest-FP	2314	412	2.5
West Dyes Inlet Chico Beach Dr	Rest-FP	2386	413	2.5
Unnamed Creek at head of Liberty Bay	Rest-FP	2067	414	2.0
NE Country Club Rd	Rest-FP	2320	415	2.0
East Chico Bay	Rest-XS	2154	416	1.8
East Chico Bay	Rest-XS	2155	417	1.7
East of Anderson Creek	Rest-XS	2381	418	1.4
Miemois Creek	Rest-XS	2353	419	1.2
North of Waterman Point	Rest-ST	2219	420	1.1

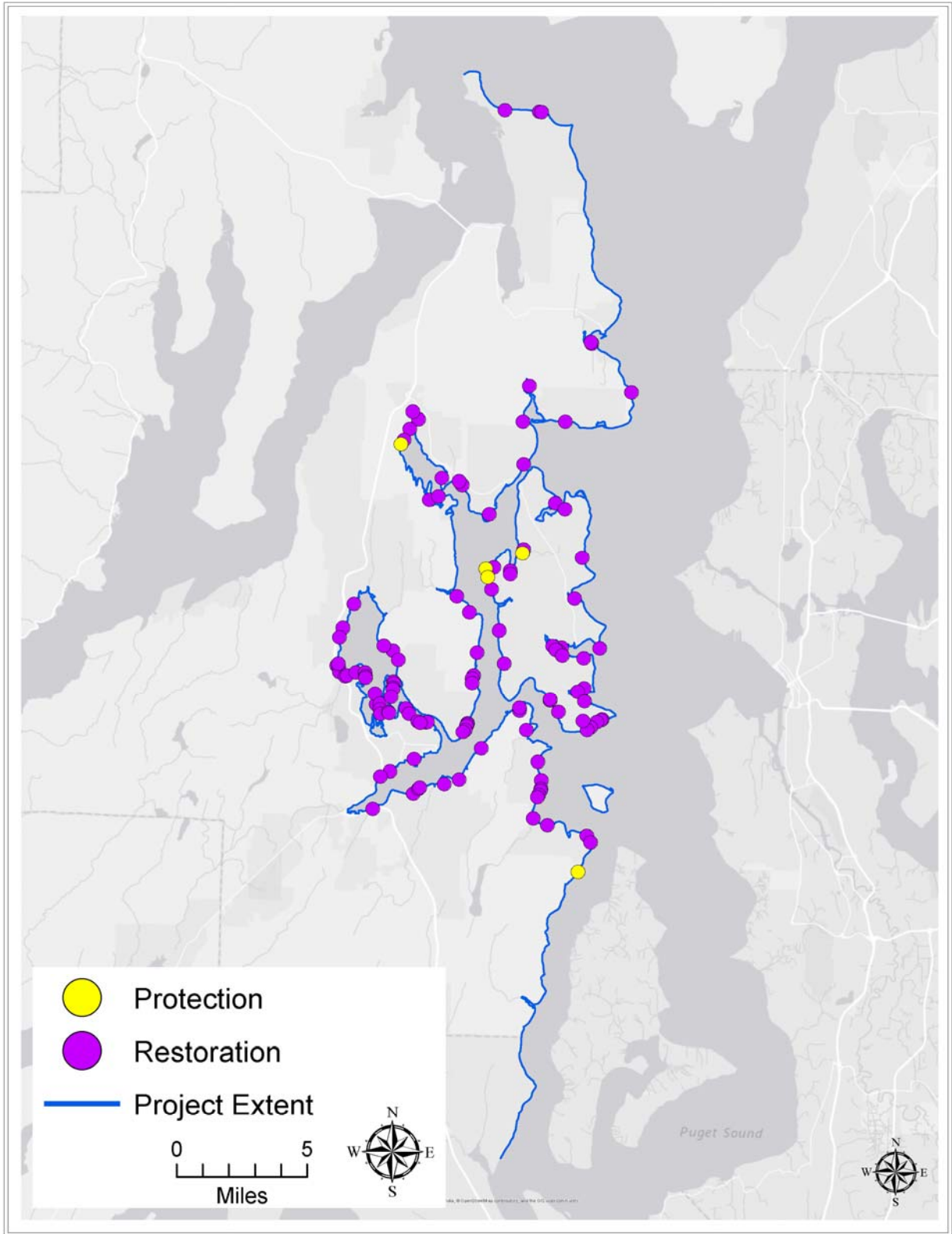


Figure 13. Distribution of West Sound Tier 4 Priority Projects

6.0 RECOMMENDATIONS

The West Sound project area provides important rearing habitats and migratory corridors for juvenile Chinook salmon originating from other watersheds in Puget Sound. The integration of nearshore habitat information and the prioritization provided in the analysis intends to inform where restoration and protection efforts are focused. It is the project team's hope that the resulting prioritized restoration and protection project opportunities provide a solid path forward for implementing beneficial restoration and protection actions.

Given the limited time and funding available to develop projects, as well as the urgency associated with the Endangered Species Act listing, it is most effective to work strategically by pursuing those opportunities that are anticipated to provide the highest benefits for juvenile Chinook. It is assumed that implementing Chinook habitat projects that protect and restore natural processes will provide ecosystem benefits for multiple marine and estuarine species.

The greatest value and utility of the prioritization framework is not the absolute scores, but are instead the relative scores of a given project compared to others. The relative scores indicate each project's relative benefits for juvenile Chinook salmon. Achieving the anticipated benefits assumes that protection and restoration actions effectively target the habitat attributes upon which the prioritization is based.

While great restoration work has been completed in West Sound and throughout the region, restoring processes that have been degraded by shoreline development comes with some uncertainty as to whether full process restoration can be achieved and the timeline for the realization of those benefits. For that reason, preventing the degradation of intact processes through protection actions in portions of the project area provides more certainty of success. There are multiple approaches for protecting the shorelines, including fee simple acquisition and conservation easements. Many of these areas could also be protected through effective and enforced local, state, and federal environmental regulations. The approach to strategically implementing projects should include a mix of protection and restoration projects to stop the decline in existing conditions and to turn the corner towards net improvement of conditions contributing to Chinook salmon recovery.

Although the emphasis should be on strategic pursuits, it is recognized that opportunistic projects will also continue to be part of the recovery efforts. The reality is that the project database is not comprehensive so there are certainly additional project opportunities and characteristics that may develop and provide meaningful benefits. Also, some opportunism in developing projects can foster working relationships and public support that may lead to more substantial and beneficial projects in the future. For example, a good demonstration project at a visible area, such as a park, can have recovery benefits through public education that extend beyond the physical changes made in the project.

The next step for any of the projects in the database is to gain additional information on project feasibility, particularly landowner willingness. Additional site-specific feasibility is needed to inform each project and whether implementation is realistic. Similarly, some areas where projects were not identified due to apparent infeasibility (e.g., due to house or shed being close to top of bluff) may be possible if the landowner is interested in addressing the constraint (e.g., setting the structure back from the bluff). Another aspect of the feasibility is to confirm whether the analysis of benefits estimated in this report appears to be accurate. The analysis completed in this report was based on remote data and a site visit may add information regarding the accuracy of the remote data used to characterize the opportunity.

With the above-described considerations in mind, Tables 15 and 16 provide a suite of strategic actions and implementation measures directly aimed at supporting priority restoration and protection projects for the nearshore. The strategy's ultimate goals are to increase Chinook salmon populations; and to recover and protect underlying processes that support nearshore ecosystems and its functions. The outline of strategic actions and implementation mechanisms are intended to be comprehensive and cover a broad scale; however, it is recognized that the outlined list may not be exhaustive. Options for strategic actions not identified currently may also present themselves in the future as landowner willingness, societal perceptions, regional priorities, and funding opportunities change.

Overall, the prioritization framework provides a science-based interpretation of the projects that will contribute most to the recovery of Puget Sound Chinook. The framework is intended to be a "living document" such that new project opportunities can be added to the project database and scored using the framework to estimate relative benefits for Chinook. It is also hoped that projects on the list will be completed and checked off the list. It is anticipated that the prioritization framework will be updated in the future as additional information on conditions for characterizing the relative benefits of projects is available. Future updates are anticipated to be done by Kitsap County, who has the familiarity and training to use the tool. The project database and prioritization framework currently reside on Kitsap County's server, making it practical for the county to maintain this database. There are multiple parameters known to contribute to the overall health of the ecosystem and specifically conditions for Chinook salmon, but the data were incomplete or insufficient to use in the analysis. These parameters included: water quality, particularly associated with outfalls and non-point sources; updated fish passage data at water crossings (e.g., road crossings); stream habitat quality for rearing; and updated eelgrass data.

Table 15. Strategy for Nearshore Restoration and Protection in the West Sound

Strategic Action	Timeline (Short-term: 0 to 3 years; Mid-term: 4 to 5 years; Long-term: 6 to 10 years)
Promote and support highly ranked project opportunities for restoration and protection. These highly ranked projects fall within Tier 1. Focus on Tier 1 projects first. In Tier 1 there are 20 protection, 28 restoration and two combination projects.	Short- to long-term, depending on landowner willingness and funding.
Actively seek private landowner willingness for higher tiered projects on private parcels (Tiers 1 and 2). This action is within the realm of local not-for-profit groups, such as Land Trusts and Salmon Enhancement Groups, and groups that provide education and outreach such as university learning extensions (e.g., Great Peninsula Conservancy, Bainbridge Island Land Trust, and Washington State University Extension Shore Stewards.) Current programs, such as Shore Friendly Kitsap, that connect voluntary homeowners with restoration resources present an opportunity to determine landowner willingness for some of these projects.	Short- to long-term
Actively pursue highly ranked projects on publicly owned lands, and seek support and sponsorship from appropriate jurisdictions (or other possible “owners” of the action) (Tiers 1 and 2). Counties, cities, and Tribes would be the most likely sponsors to spearhead these projects.	Mid- to long-term depending on jurisdiction willingness and funding.
Periodically revisit highly ranked projects that have not yet moved forward to determine if potential for implementation has changed. Constraints like land ownership and landowner priorities may change over time. Persist with large projects that may be more challenging with respect to multiple landowners and coordination, yet yield high potential benefits.	Mid to long-term
Promote and support moderate and lower tiered projects with existing landowner willingness and feasibility (Tiers 3 and 4). This action would take advantage of existing momentum to improve habitat attributes that restore nearshore processes.	Short-term
Update database periodically and “run” prioritization framework to reassess project importance as projects are completed or new projects opportunities arise or new datasets are available for use in the scoring framework. Updating allows for the database to be remain current and to assess how the framework is performing for project selection and development.	Mid- to long-term. At minimum, every 8 years with the Shoreline Master Program (SMP) update (next update is in 2020), or to coincide with any major updates to Habitat Work Schedule (HWS), or to coincide with Four Year Work Plan update process.
Specific to Protection Strategy efforts, incorporate the analysis results (protection project opportunities and priority protection areas) in land use policy and regulations. Utilize the protection and restoration recommendations to inform and update local SMPs (Shoreline Environment Designations, Restoration Plans, Goals and Policies), and Comprehensive Plans (goals and policies in Land Use and/or Environment Chapter).	Long-term
Specific to Restoration Strategy efforts, incorporate the analysis results (restoration project opportunities) in existing plans that support policy. In next update for the SMP Restoration Plan, add higher ranked restoration projects (or all Tiers) to the listed marine and estuarine projects within the plan. This action can occur across the County and cities.	Mid-term
Update the Habitat Work Schedule (HWS) with all priority project opportunities. HWS is an online database organized by Lead Entity, and includes proposed and current restoration and protection projects.	Short- to mid-term
Incorporate higher ranked projects (those that are not identified on Four-Year Work Plan in In-Lieu-Fee Mitigation programs as potential receiving sites when they are established in Kitsap County.	Mid- to long-term

Table 16. Implementation of Restoration and Protection Projects

Mechanism for Project Implementation	Description
West Sound Watersheds Council (WSWC) and Salmon Recovery Funding Board	Project sponsors can use the ranked priority projects lists to gather support for current projects that are in progress. Additionally, the database of ranked projects can assist in developing new projects.
Four-Year Work Plan	WSWC can use priority areas or sets of priority project opportunities to inform the Four-Year Work Plan. WSWC should actively pursue and support highly ranked projects that have been selected to be incorporated in this plan.
Near Term Actions (NTAs) of Puget Sound Partnership's Implementation Plan	Highly ranked restoration and protection projects lists can be used to inform NTA updates in the future. Incorporating high-priority projects within NTAs will help to leverage funding avenues.
Public Works Transportation Improvement Programs (TIP) and Capital Facilities Plans (CIP)	Priority nearshore projects, which are public roads-related (e.g., intertidal culvert replacements and bridge building in tidal areas), should be evaluated for alignment with local jurisdictions' needs for infrastructure and maintenance. Overlapping nearshore and infrastructure priorities could accelerate identification of multiple funding sources for construction, and ultimately project implementation. Coinciding high-priority projects for nearshore restoration and transportation infrastructure should be included in jurisdiction's TIP process, and CIP when appropriate. It is recommended that local County departments coordinate with their local public works department on TIP project evaluation and ranking. Also of value is for public works departments to consider incorporating this nearshore project prioritization and ranking within the current TIP process for project evaluation. Modifying the current TIP process using this prioritization will increase the ecological significance of projects on the TIP.
In-Lieu Fee Programs	Incorporate higher ranked projects, and those not identified on the Four-Year Work Plan, as potential receiving sites within In-Lieu Fee Programs when such programs are established in Kitsap County. This would provide off-site mitigation options for nearshore impacts.

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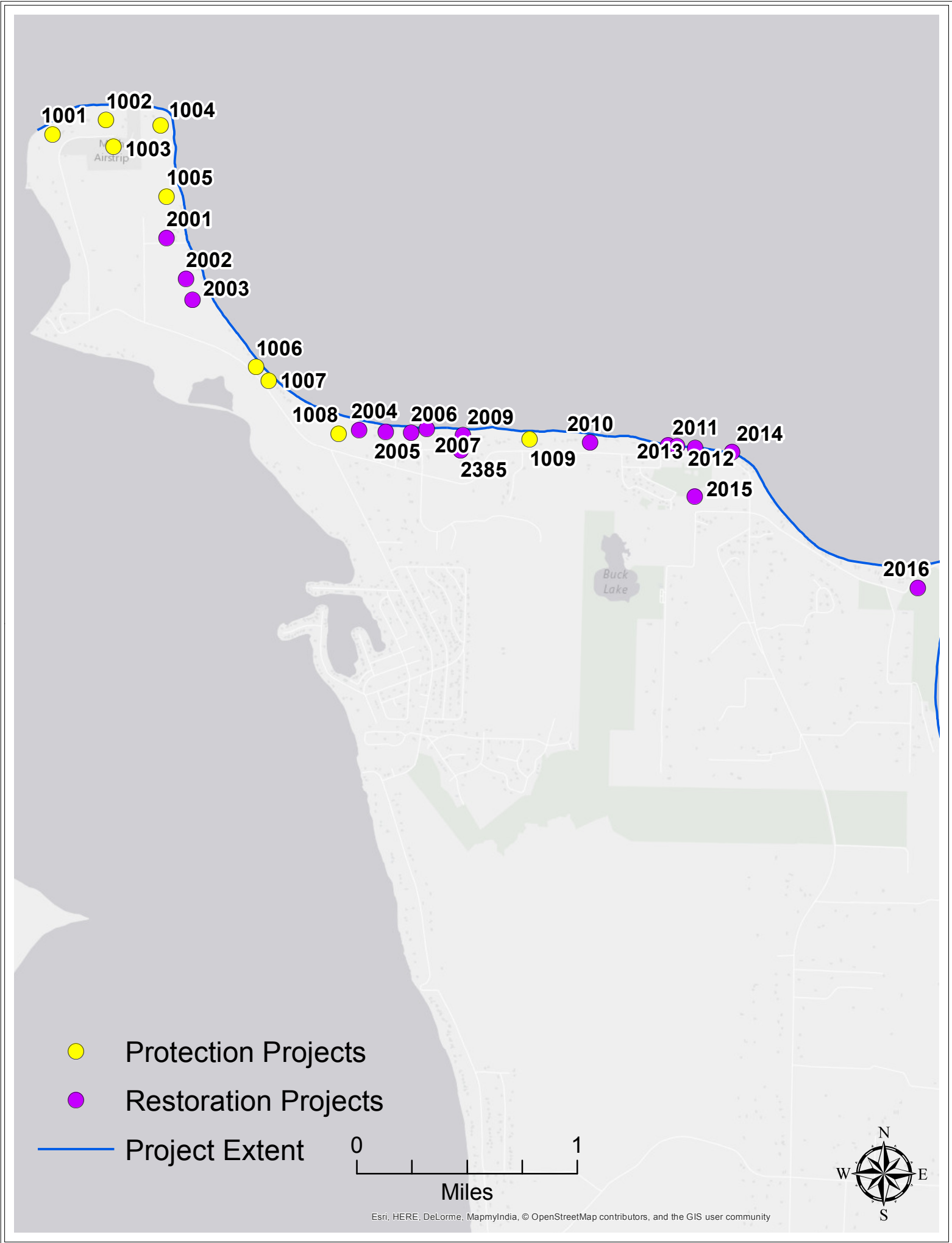
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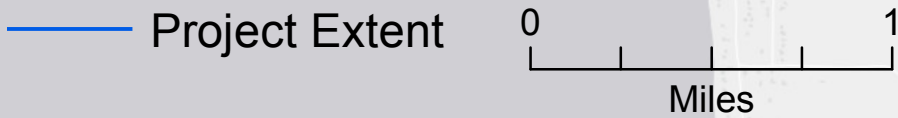
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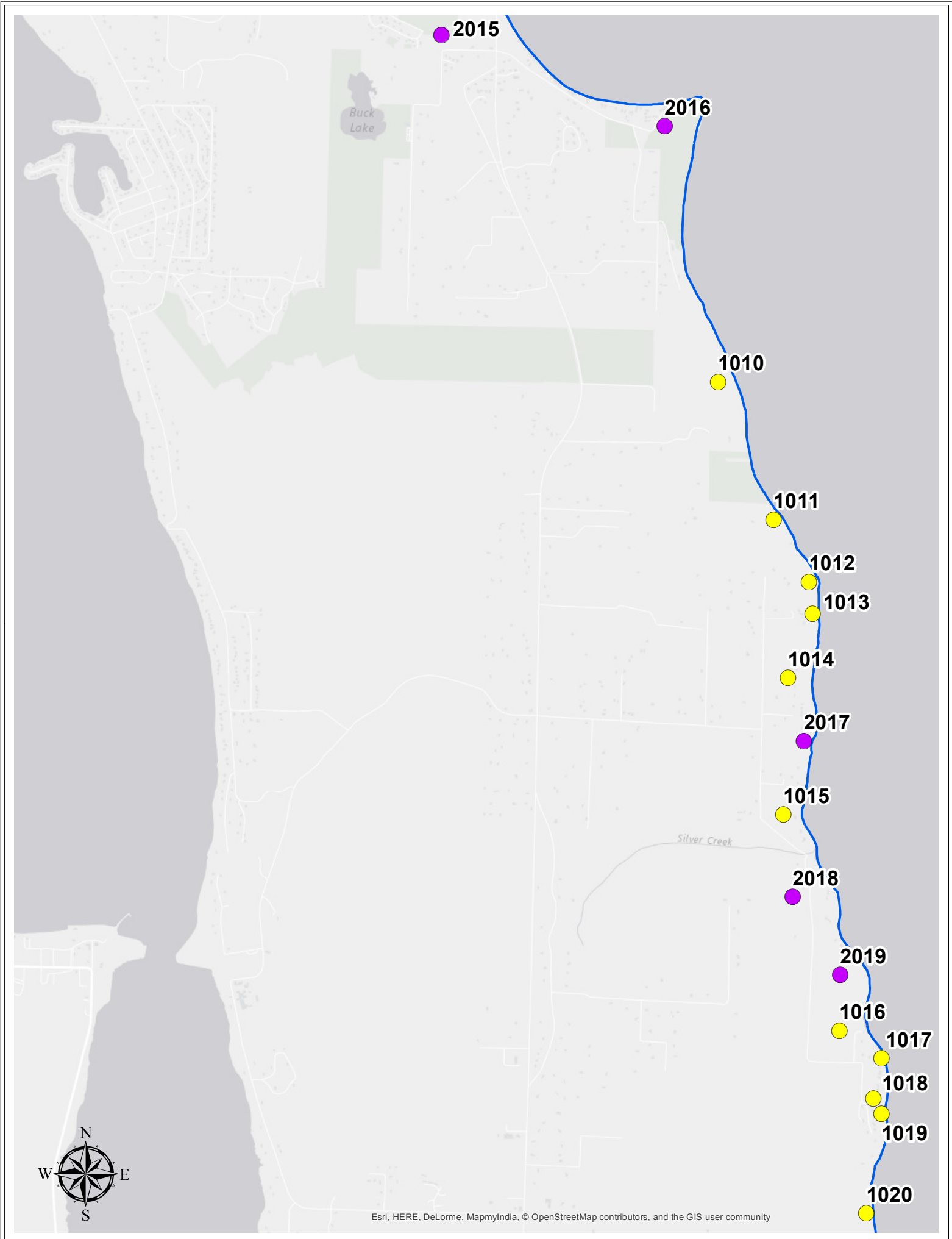
Appendix A

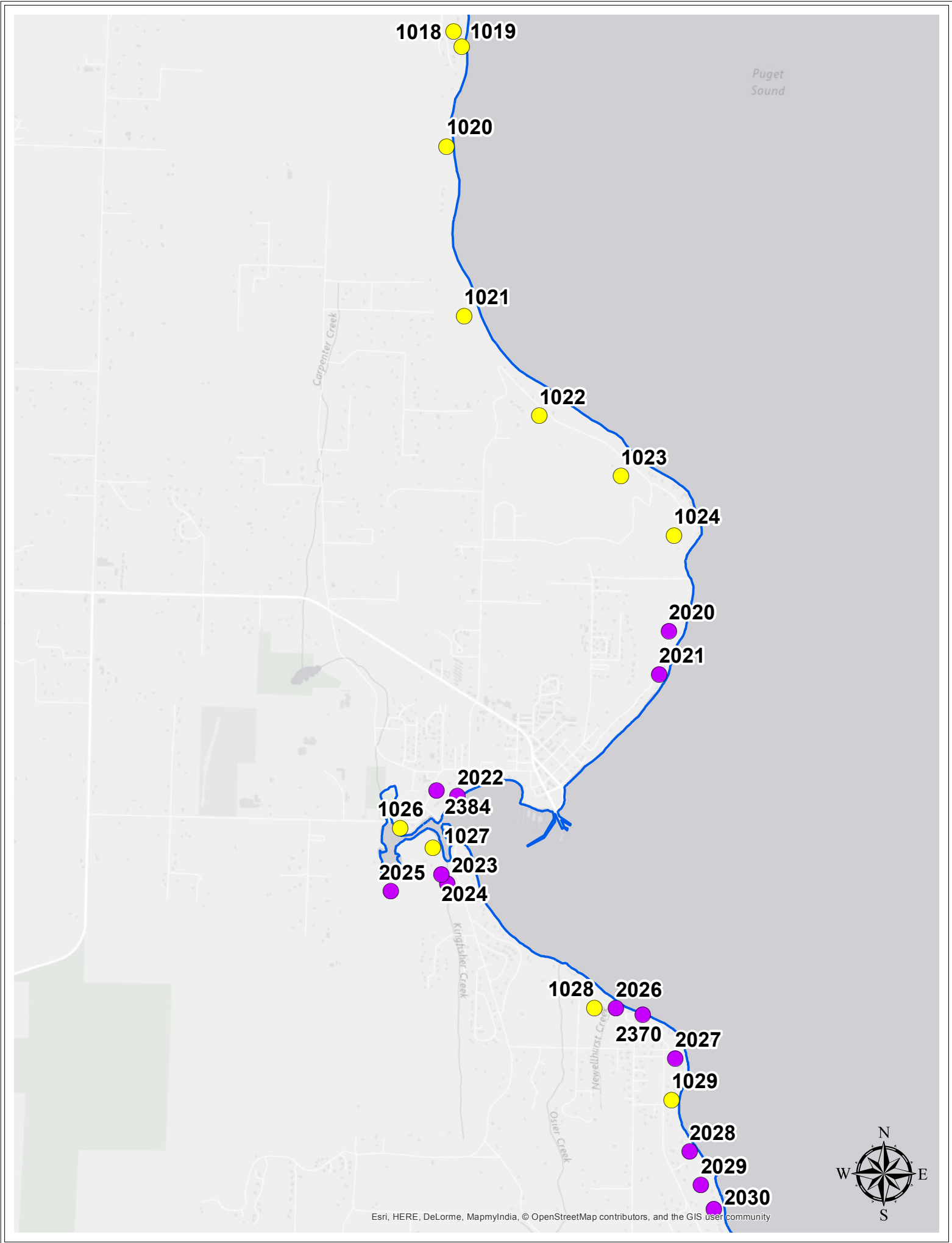
Detailed Maps of Project Opportunity Locations

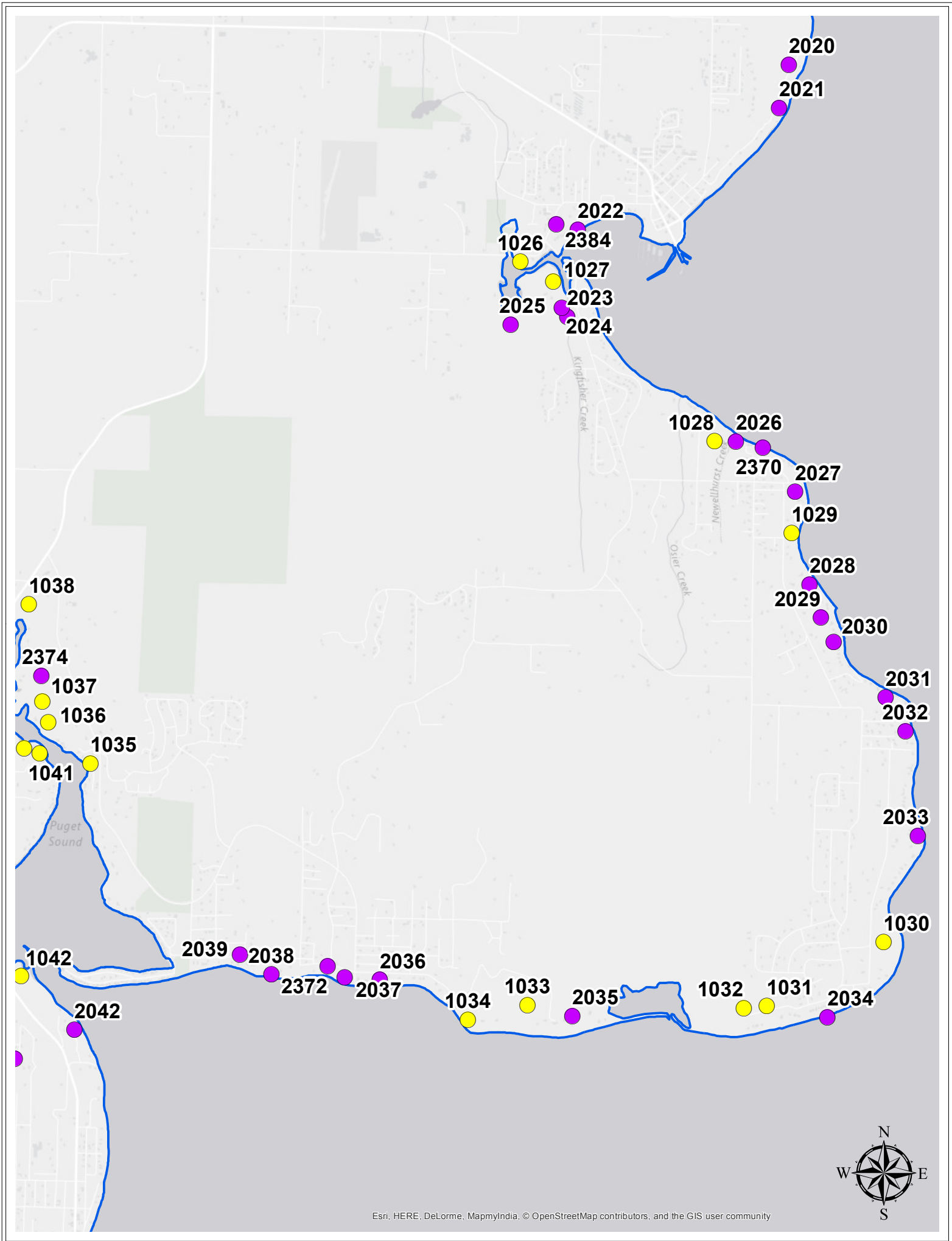


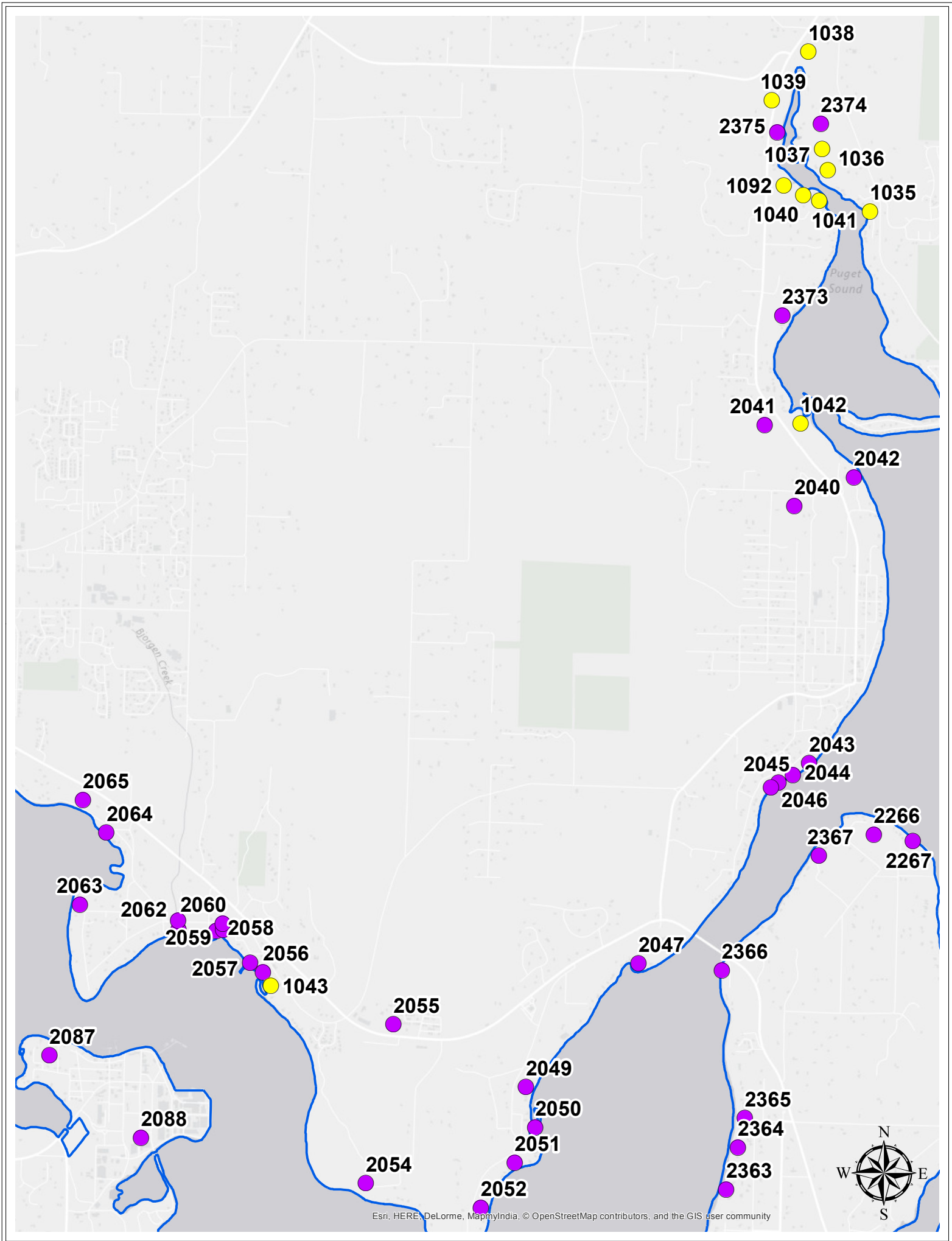
- Protection Projects
- Restoration Projects

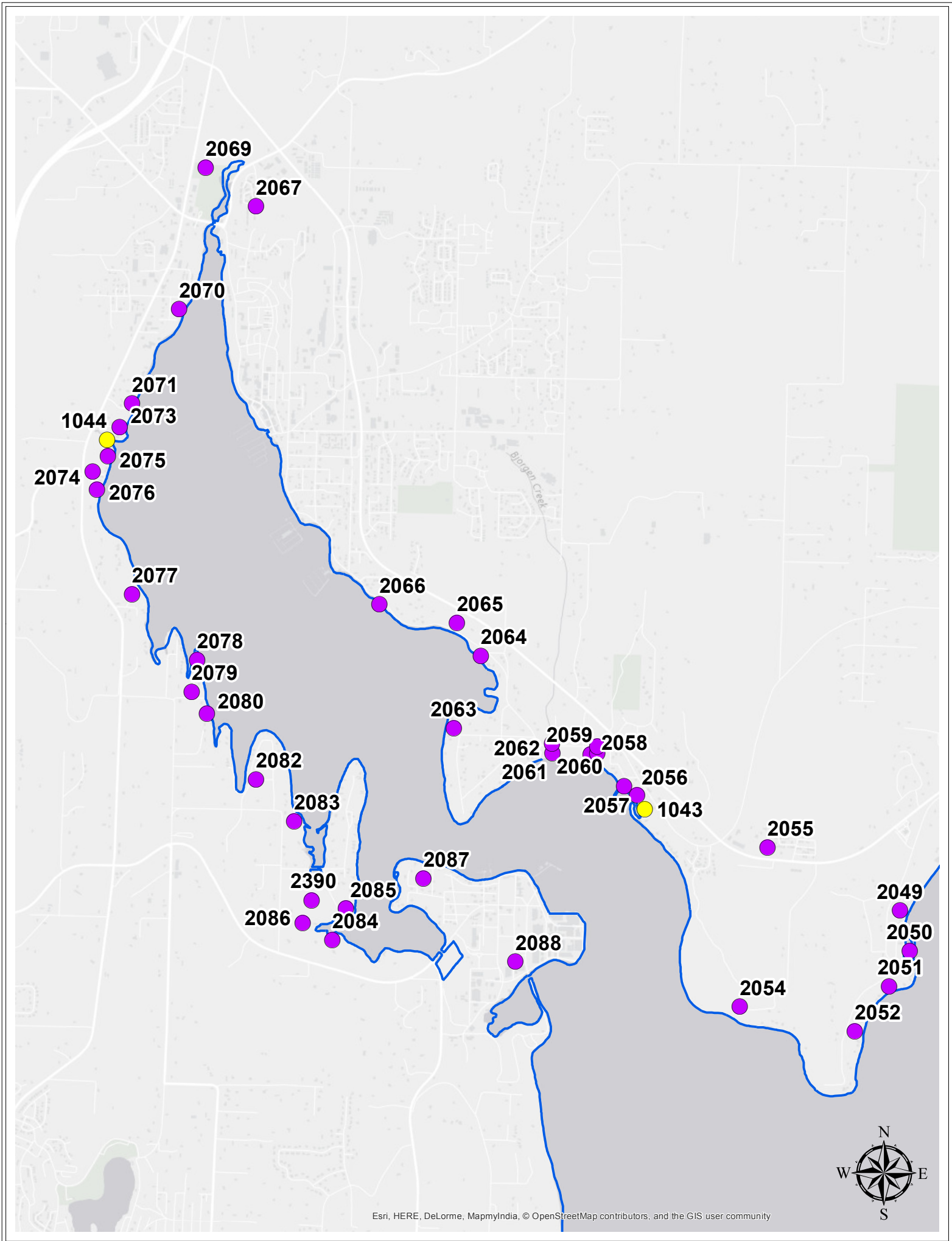


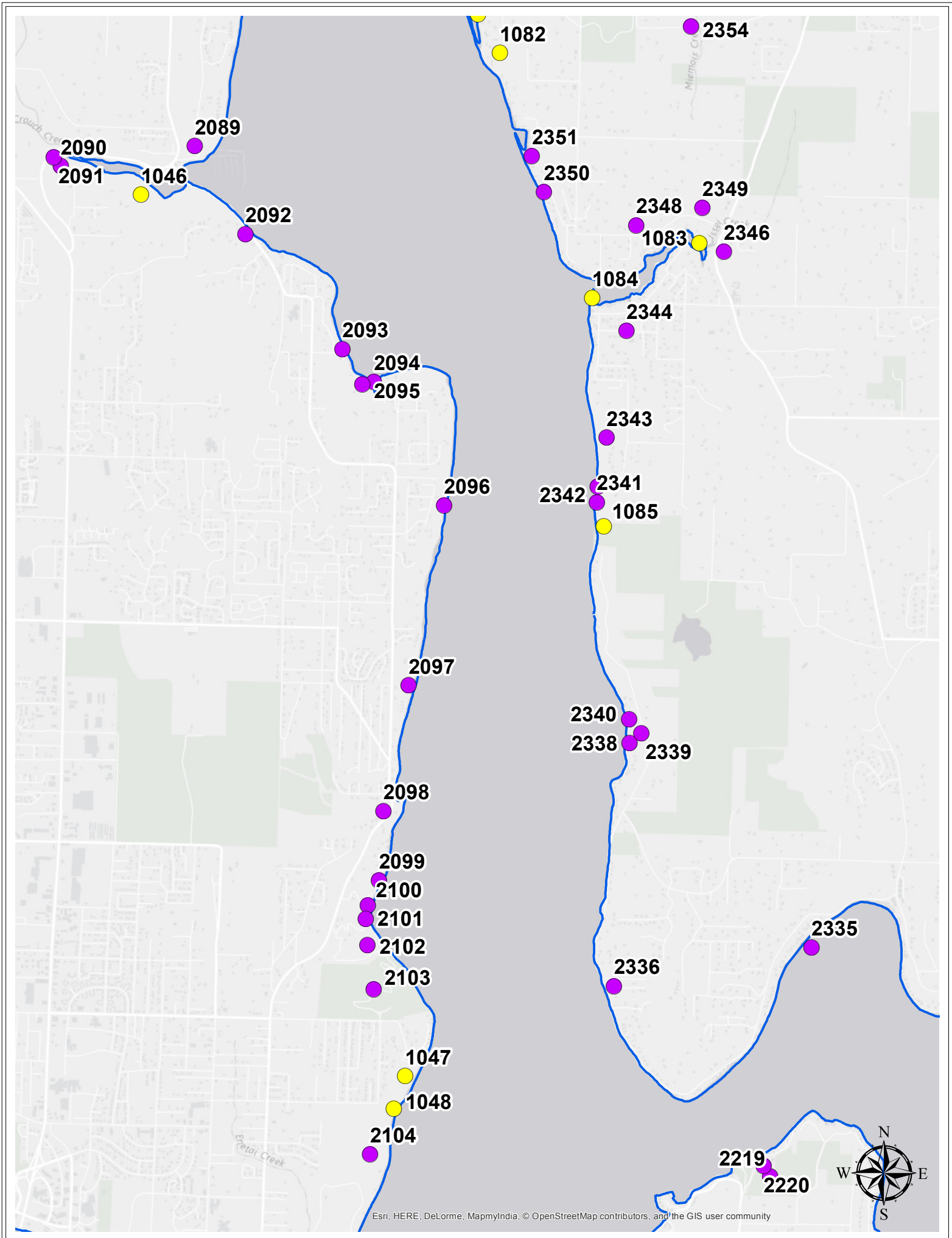


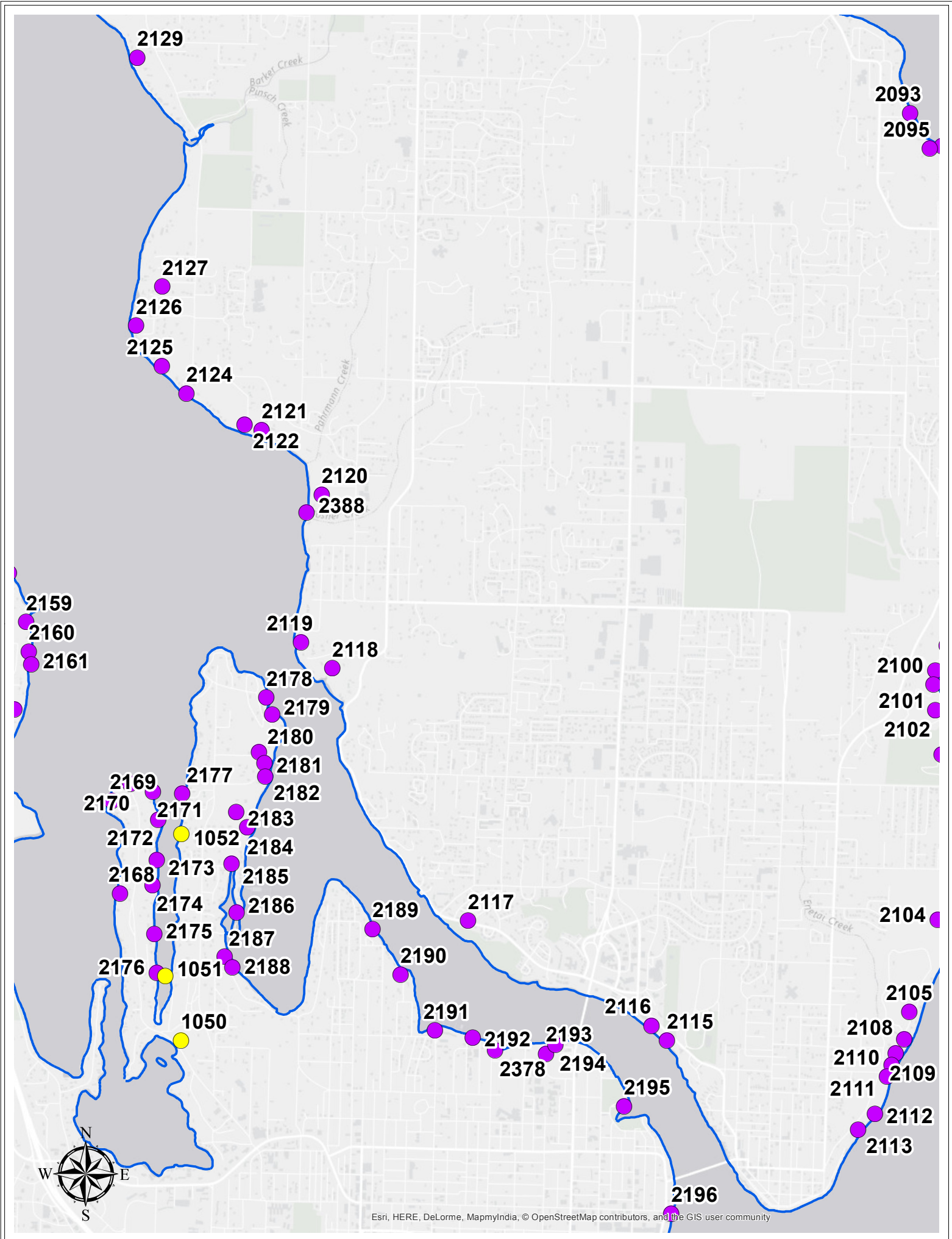


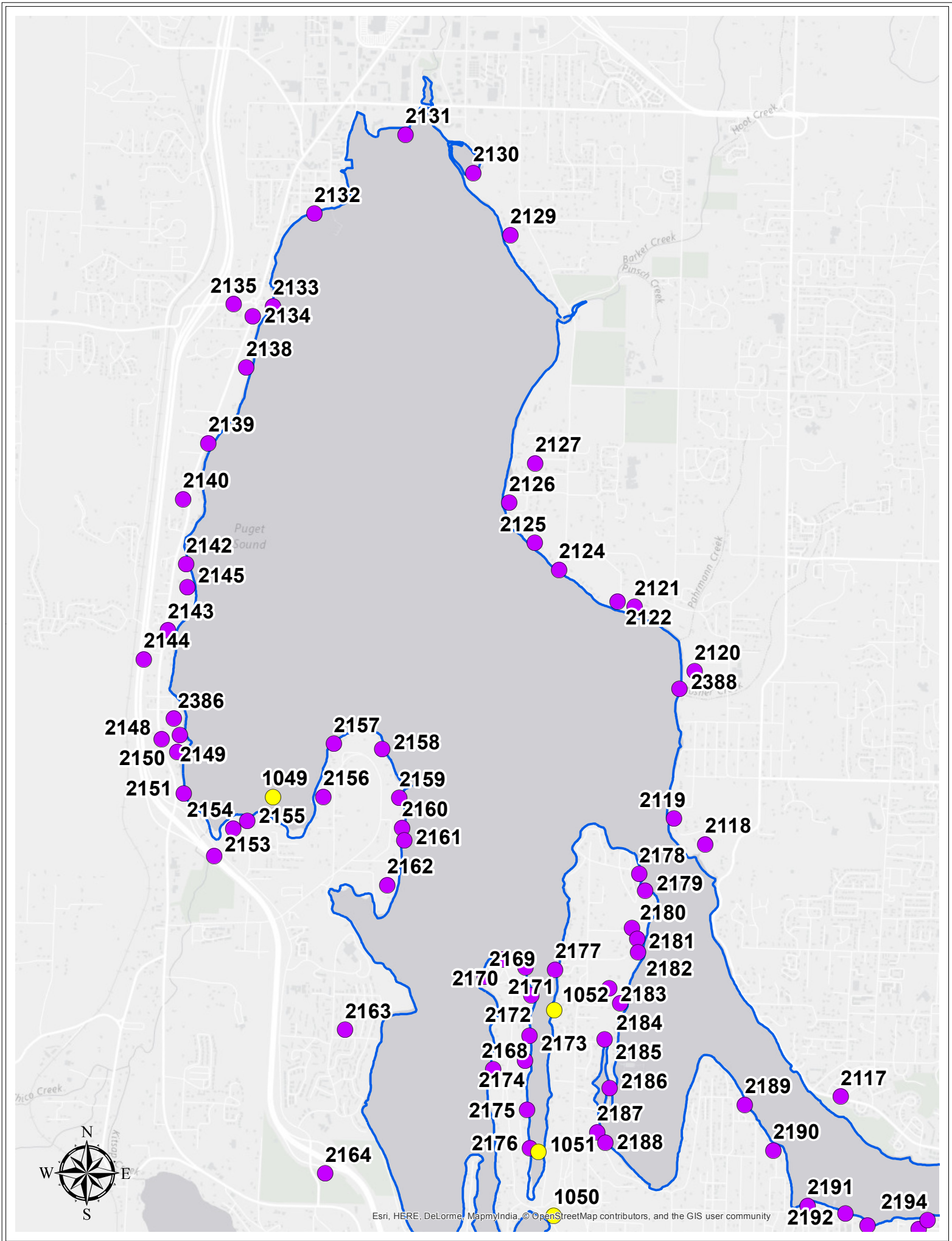




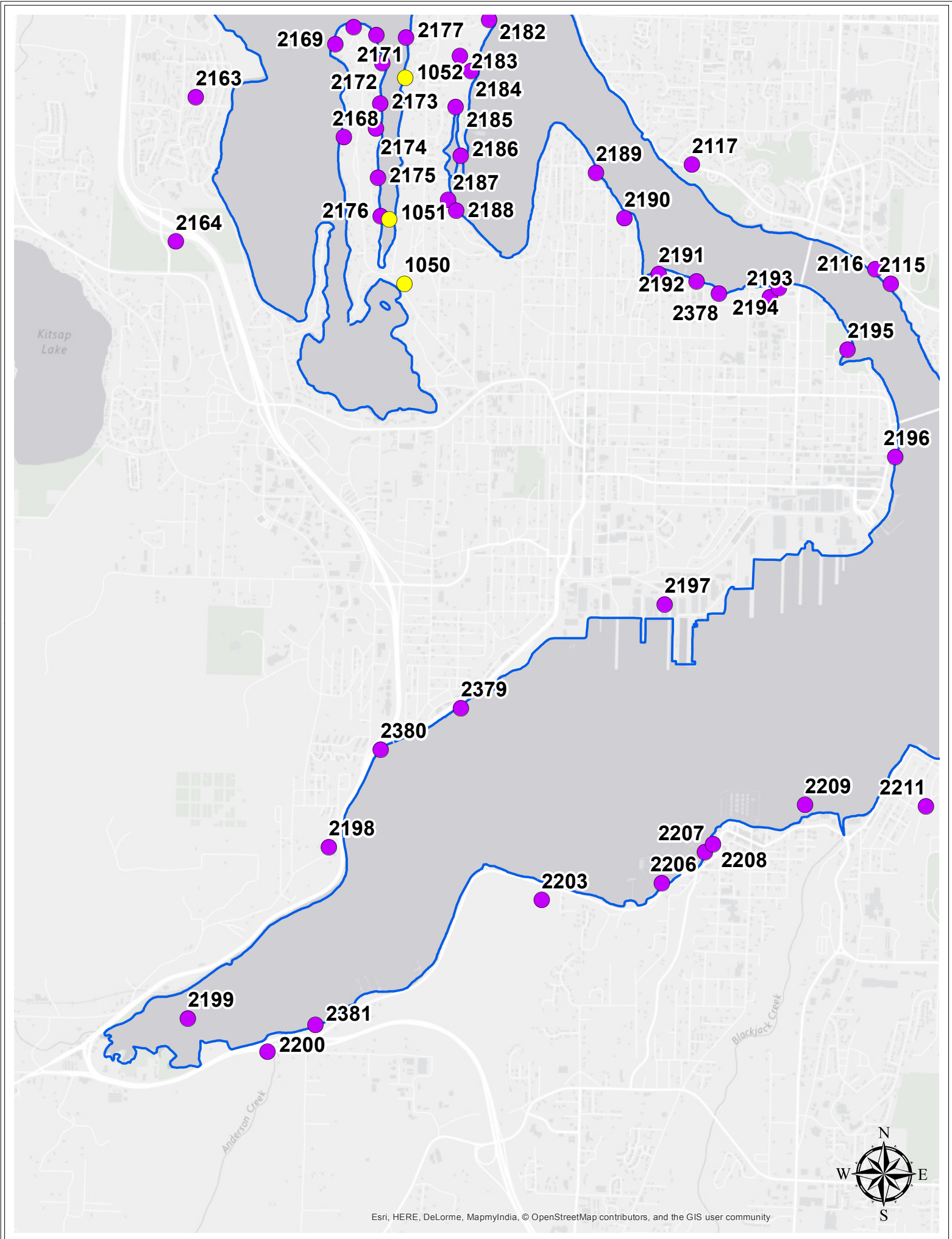


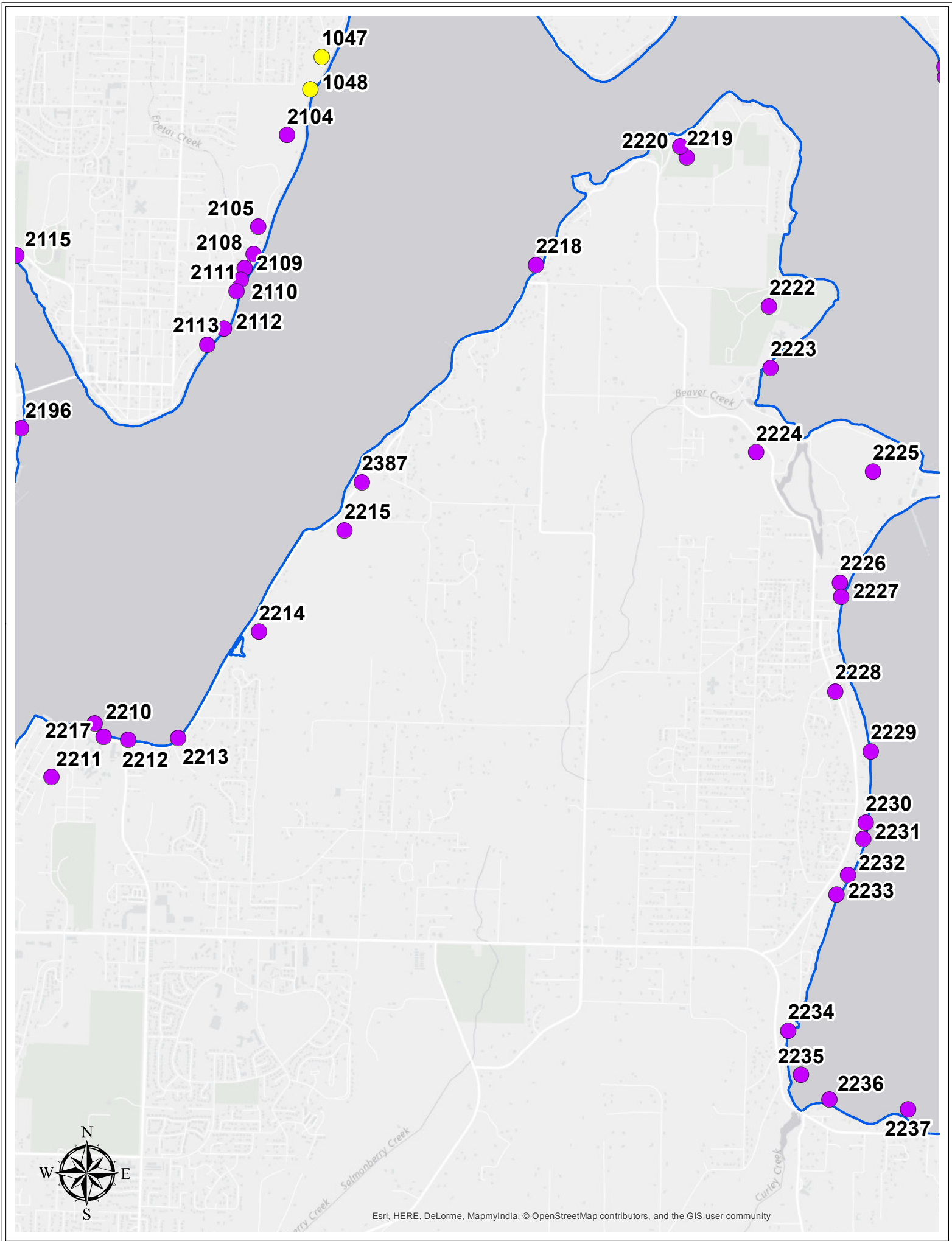


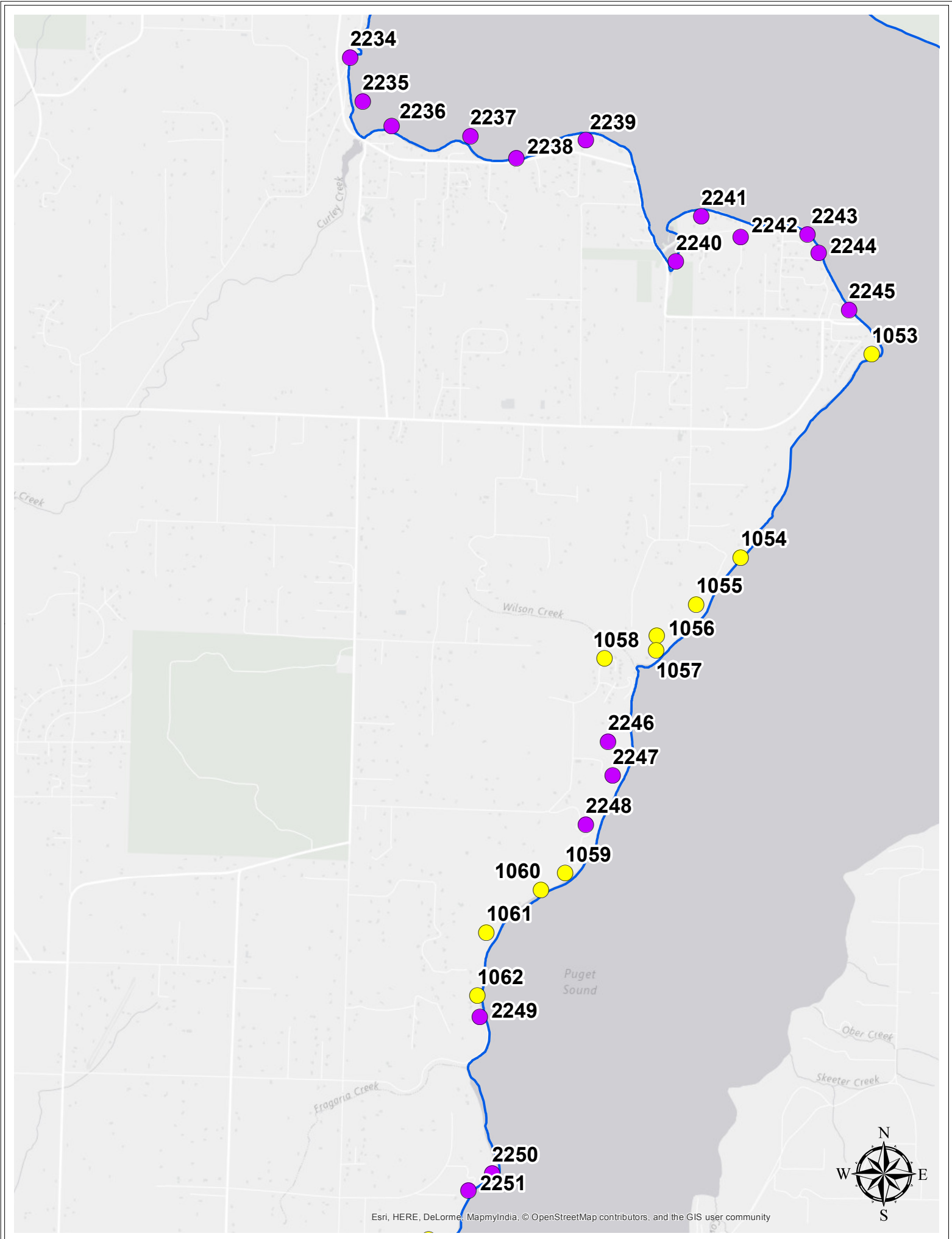


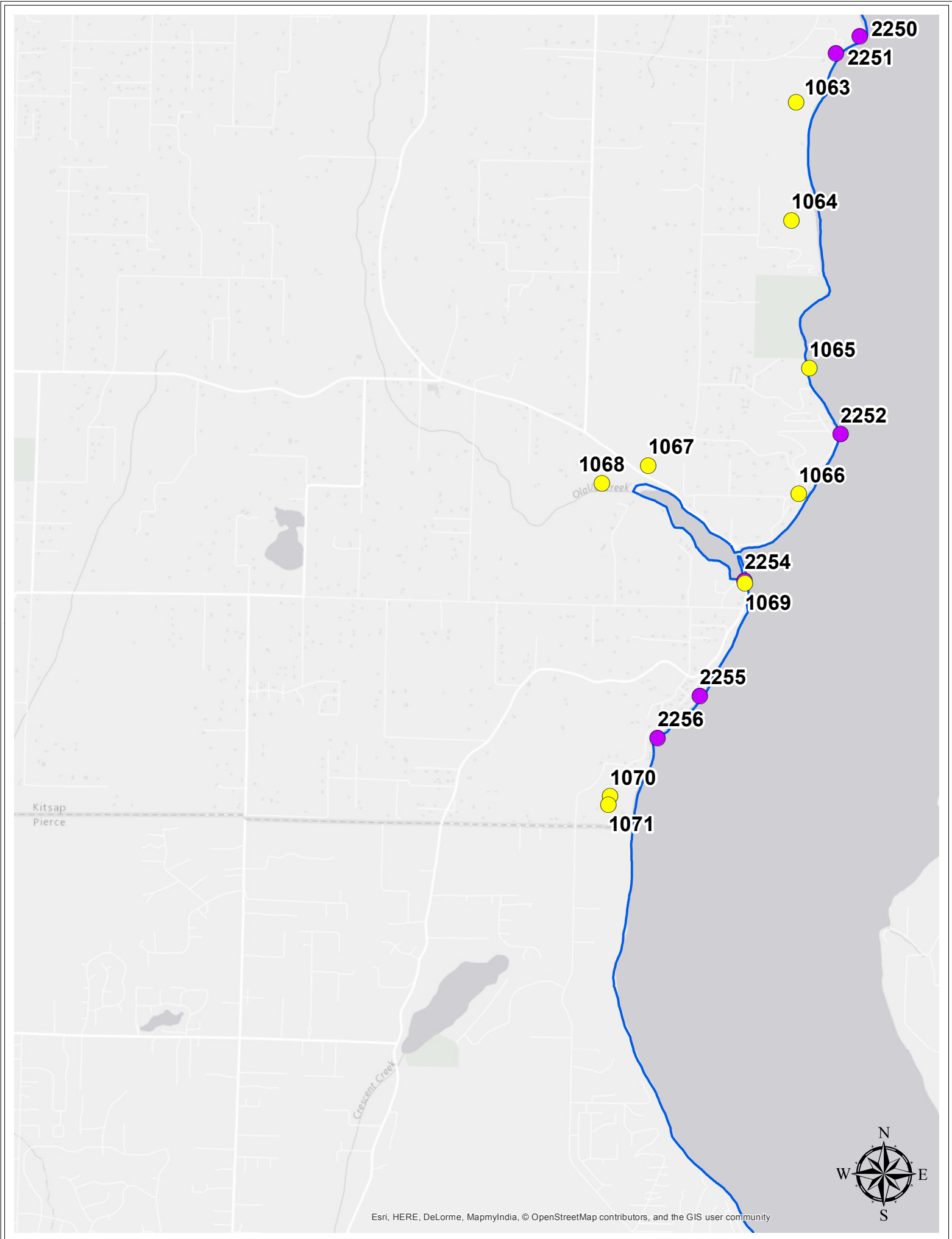


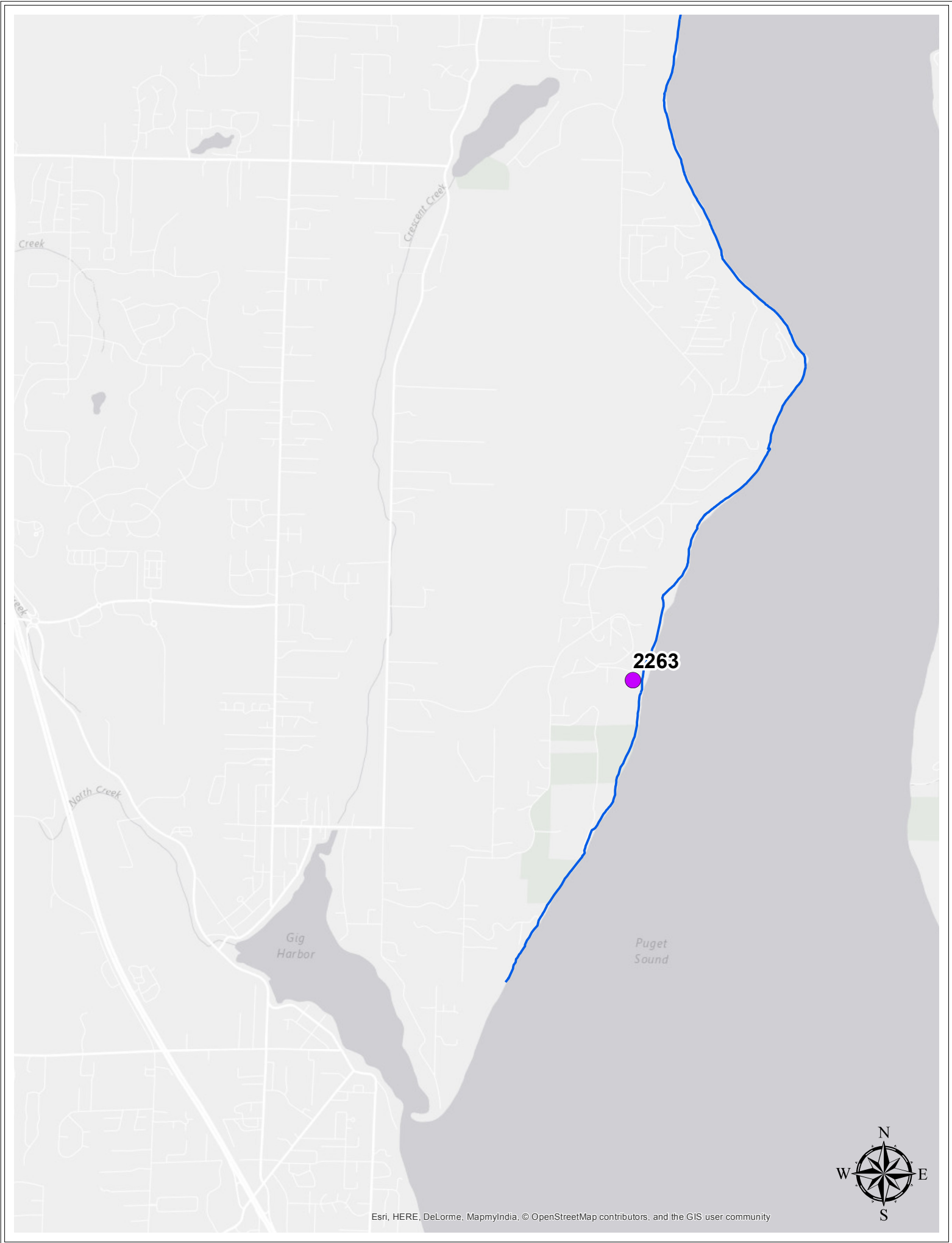
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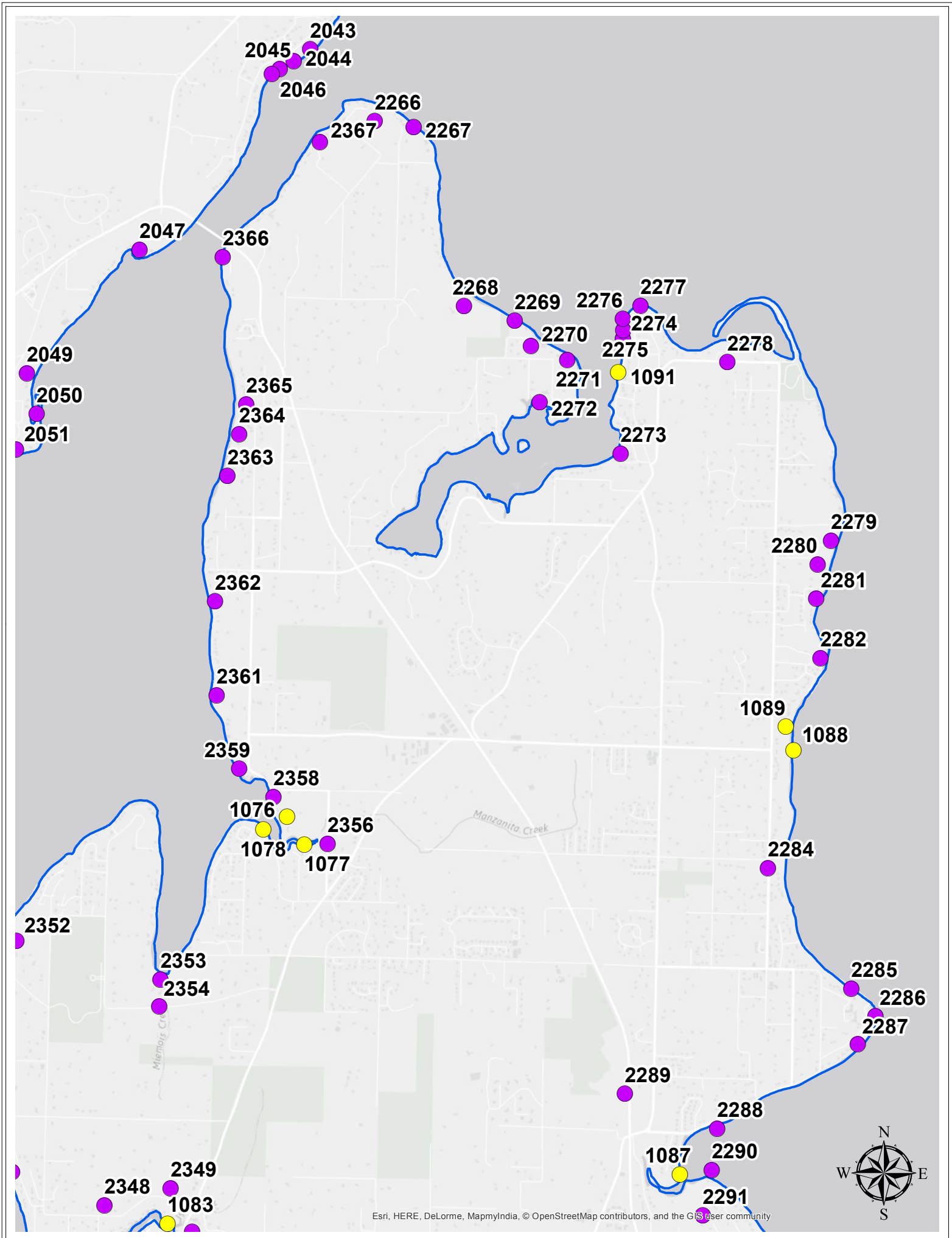


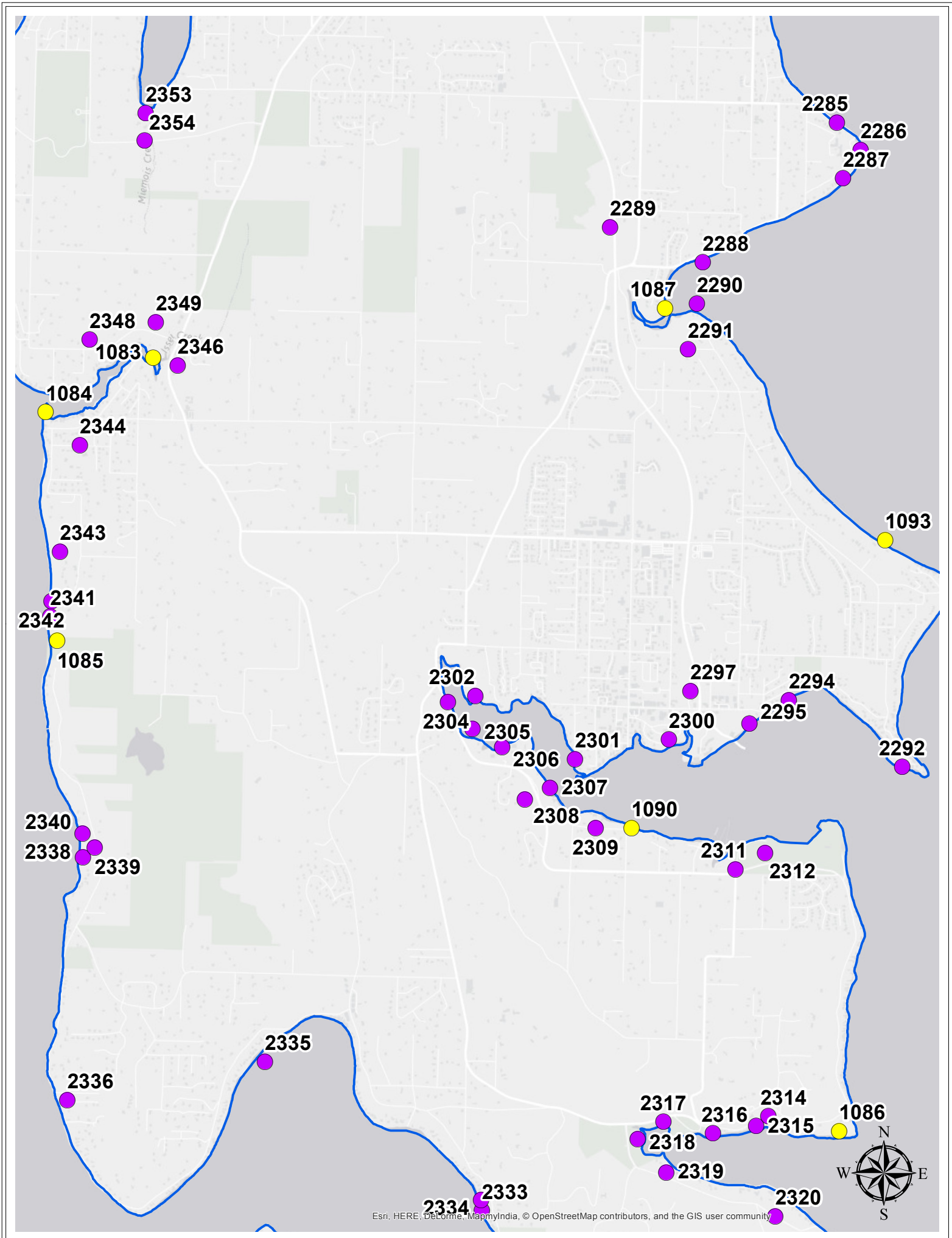


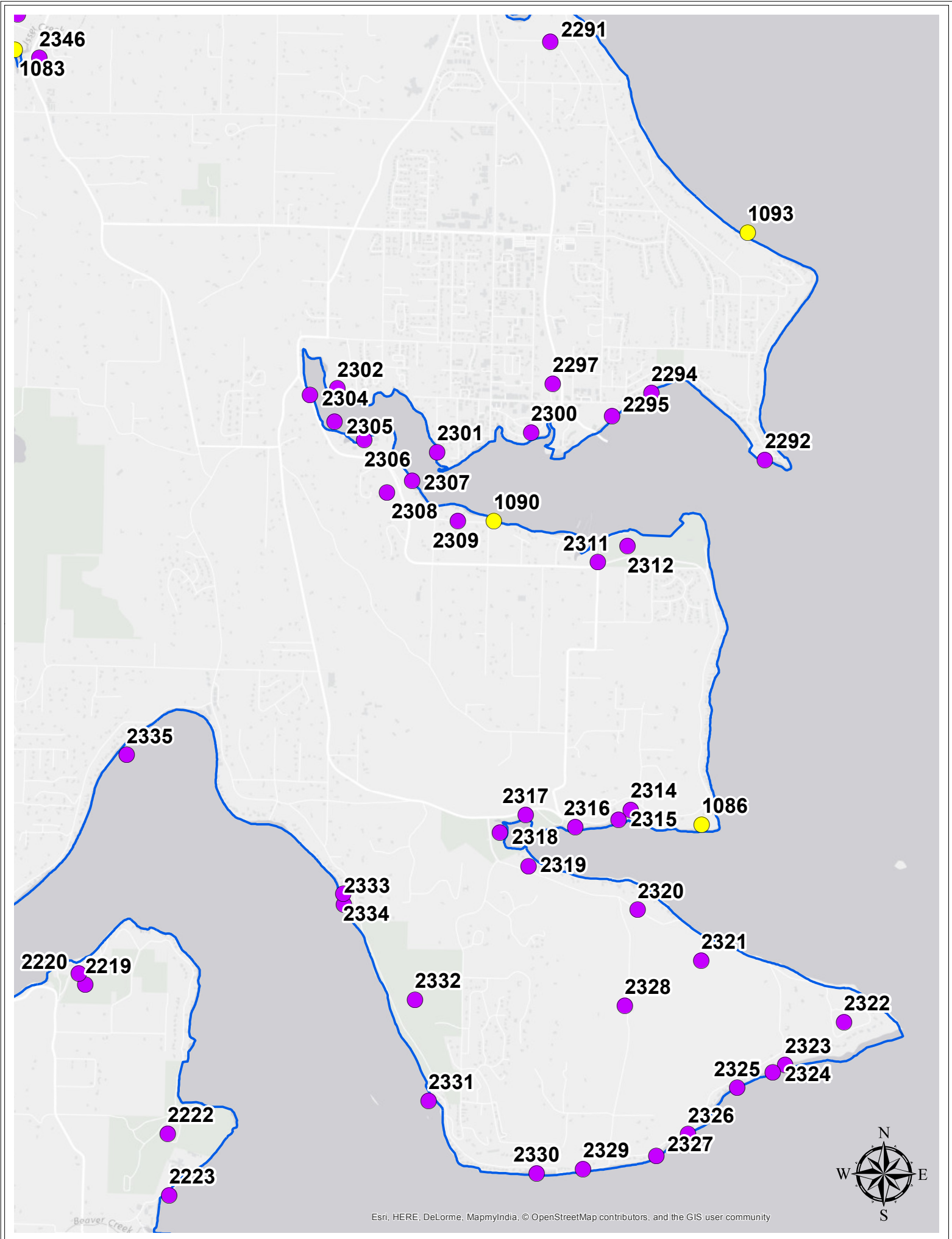












Appendix B

User Guide for Databases

USER GUIDE FOR WEST SOUND NEARSHORE INTEGRATION AND SYNTHESIS PROJECT AND PARCEL DATABASES

1.0 INTRODUCTION

This User Guide describes the databases prepared as part of the West Sound Nearshore Integration and Synthesis Project. The project is described in the project report titled *West Sound Nearshore Integration and Synthesis of Chinook Salmon Recovery Priorities – Updated Final* dated November 2017 and prepared by Confluence Environmental Company. Two databases were created as part of the project:

- The project database contains only the parcels for which project opportunities were identified and evaluated.
- The parcel database other contains all parcels in the project area that are within 200 feet of the shoreline or the lower 650 feet of creeks.

Both databases contain parcel data, but the project database is a subset of the parcels contained in the parcel database.

The project database is available and used as both an ArcGIS geodatabase and a Microsoft Excel spreadsheet. The Excel version includes the formulas used for scoring projects. The geodatabase contains the outputs of the scoring, but does not include the formulas. For evaluating scoring inputs of projects currently in the database and adding projects in the future, the Excel is more useful. This is because the Excel version includes the formulas which show the linkages between columns (fields) and facilitates the calculation of new numbers (i.e. scoring metrics) for new projects.

The parcel database is available as an ArcGIS geodatabase. The parcel database is a large compilation of data from several data sources, including previous assessments, SMP Restoration Plan project lists, and the Counties tax parcel databases. The database also includes fields generated as part of the prioritization (scoring) framework.

2.0 USING THE PROJECT DATABASE

The Excel version of the project database includes two tabs:

- Scoring Spreadsheet (organized by parcel)
- Summary of Scores (organized by project)

The Scoring Spreadsheet tab contains all the columns contributing to the project scoring. Columns requiring calculation include the formulas for that specific calculation. This allows

users to see the other data contributing to the output in that column. It facilitates users adding rows to calculate scoring for new projects identified in the future. For new projects, users should use the parcel database to determine which parcel(s) contain the project. One row should be added to the project database for each parcel included in the project to be scored.

A description of each field in the project database is provided in Table B-1. The table also describes how users can populated each field to score new projects. For projects restoring or protecting sediment processes, there is no overlap in shoreline area designated as addressing sediment supply, sediment transport, and cross-shore connectivity. Projects fitting the description of multiple project types are considered combination projects that get scored separately for each project type.

t
 (<http://www.ecy.wa.gov/programs/sea/shorelines/FeederBluffs/pdf/MapFolioCGS2013.pdf>)

Table B-1. Explanation of Project Database Fields

Excel Column	Field Name	Description	Instructions for Populating Spreadsheet for Any New Projects Added
A	OBJECTID	GIS assigned identifier	n/a
B	APN_TPN	Parcel number	User input based on parcel(s) containing project. Number(s) found in parcel database.
C	URL	Link to Ecology aerial oblique of project vicinity	n/a
D	Project_ID	Four-digit project number. 1### are protection projects. 2### are restoration projects.	Not necessary, but could be assigned sequentially if desired
E	Site_Name	Description of site location	n/a
F	Rest_SS	1 = yes the project includes sediment supply restoration, 0 = no	User input based on type of project. Sediment supply restoration projects remove armoring from areas designated as a feeder bluff area (Data source is Puget Sound Feeder Bluff map folio ¹ .)
G	Rest_ST	1 = yes the project includes sediment transport restoration, 0 = no	User input based on type of project. Sediment transport restoration projects remove armoring from areas in the portion of drift cell where sediment moves along the shore (Data source is Puget Sound Feeder Bluff map folio ¹ information in sheets 1-21.)
H	Rest_XS	1 = yes the project includes cross-shore connectivity restoration, 0 = no	User input based on type of project. Cross-shore connectivity projects remove armoring from areas in the

¹ Puget Sound Feeder Bluff map folio available at:
<http://www.ecy.wa.gov/programs/sea/shorelines/FeederBluffs/pdf/MapFolioCGS2013.pdf>

Excel Column	Field Name	Description	Instructions for Populating Spreadsheet for Any New Projects Added
			portion of drift cell where sediment is not transported along the shore (Data source is Puget Sound Feeder Bluff map folio ¹ information in sheets 1-21.)
I	Rest_TF	1 = yes the project includes tidal flow restoration, 0 = no	User input based on type of project. Tidal flow restoration projects remove fill limiting inundation of a tidal embayment and/or remove obstructions affecting tidal flow into a tidal embayment.
J	Rest_FP	1 = yes the project includes fish passage restoration, 0 = no	User input based on type of project. Fish passage restoration projects address fish passage barriers known to be a partial or full barrier to fish passage.
K	Prot_SS	1 = yes the project includes sediment supply protection, 0 = no	User input based on type of project. Sediment supply protection projects prevent armoring from being installed along areas designated as a feeder bluff area (Data source is Puget Sound Feeder Bluff map folio ² .)
L	Prot_ST	1 = yes the project includes sediment transport protection, 0 = no	User input based on type of project. Sediment transport protection projects prevent armoring from being installed along areas in the portion of drift cell where sediment moves along the shore (Data source is Puget Sound Feeder Bluff map folio ¹ information in sheets 1-21.)
M	Prot_XS	1 = yes the project includes cross-shore connectivity protection, 0 = no	User input based on type of project. Cross-shore connectivity projects prevent armoring from being installed along areas in the portion of drift cell where sediment is not transported along the shore (Data source is Puget Sound Feeder Bluff map folio ¹ information in sheets 1-21.)
N	Prot_TF	1 = yes the project includes tidal flow protection, 0 = no	User input based on type of project. Tidal flow projects prevent fill limiting inundation and prevent obstructions being installed that would affect tidal flow into a tidal embayment.

2 Puget Sound Feeder Bluff map folio available at:
<http://www.ecy.wa.gov/programs/sea/shorelines/FeederBluffs/pdf/MapFolioCGS2013.pdf>

Excel Column	Field Name	Description	Instructions for Populating Spreadsheet for Any New Projects Added
O	Opportunity	Summary of project actions using abbreviations. Rest = Restore, Prot = Protect, SS = Sediment Supply, ST = Sediment Transport, XS = Cross-shore Connectivity, TF = Tidal Flow, and FP = Fish Passage	Not necessary, but could be assigned to summarize inputs to columns F through N if desired
P	Sed_proj	1 = yes the project includes SS, ST, and/or XS action, 0 = no	User input based on type of project
Q	Mngmt_Msr	Management Measures assigned based on type of action. Defined per PSNERP Management Measure Report (Clancy et al. 2009)	n/a
R	Descriptio	Description of the project actions	n/a
S	Jurisdict	Jurisdiction that the project is located in	n/a
T	Num_Parc	Number of parcels included in project	Not used in scoring
U	DC_PRTY	Drift cell priority. Integrated list of priority drift cells identified in this project	User input based on review of priority drift cell map (see Figure 2 in main report)
V	Reach_PRTY	Reach priority. Integrated list of priority reaches based on sediment processes, embayments, and salmon habitat information sources.	User input based on review of priority reaches map (see Figure 3 in main report)
W	DC_Length	Calculated drift cell length	User input based on drift cell GIS data layers
X	DowndriftL	Calculated length of shoreline that is located downdrift in the drift cell	User input based on measured distance from project location to downdrift end of drift cell. Based on drift cell GIS data layers
Y	DD_Percent	Proportion of drift cell length that is downdrift Downdrift Percent?	Formula calculates this based on DowndriftL and DC_Length. Alternatively, user could input this value and not enter values in the two contributing fields
Z	DD_embay	1 = yes there is an embayment downdrift, 0 = no Downdrift Embayment	User input using information in DdMbay field in parcel database
AA	Embay_TF	Applied to tidal flow projects to inform whether embayment is there currently (1) or not (0)	User input based on PSNERP shoreform mapping (e.g., Cereghino et al. 2012) and aerial photo interpretation
AB	Feature_Description	WDFW data on barriers; describes type of structure (e.g., culvert)	n/a
AC	Blockage_Description	WDFW data on barriers; describes whether fish passage blockage is total or partial	User input based on BlockageD field in parcel database or other available information.
AD	Owner_Type	WDFW data on barriers; describes type of landowner of the fish passage barrier structure (e.g., private or county)	n/a
AE	Data_Sourc	WDFW data on barriers; describes type of barrier (e.g., culvert)	n/a
AF	FP_Full_SA	Process score for fish passage project with full barrier and on a creek with documented salmon presence	User input based on BlockageD entry in column AC and SWIFD and WFC databases on fish distribution

Excel Column	Field Name	Description	Instructions for Populating Spreadsheet for Any New Projects Added
AG	FP_Full_CT	Process score for fish passage project with full barrier and on a creek with documented cutthroat trout presence	User input based on BlockageD entry in column AC and SWIFD and WFC databases on fish distribution
AH	FP_Full_no	Process score for fish passage project with full barrier and on a creek with no documented salmon or trout presence	User input based on BlockageD entry in column AC and SWIFD and WFC databases on fish distribution
AI	FP_Part_SA	Process score for fish passage project with partial barrier and on a creek with documented salmon presence; barriers with passage unknown or not defined were considered partial barriers	User input based on BlockageD entry in column AC and SWIFD and WFC databases on fish distribution
AJ	FP_Part_CT	Process score for fish passage project with partial barrier and on a creek with documented cutthroat trout presence; barriers with passage unknown or not defined were considered partial barriers	User input based on BlockageD entry in column AC and SWIFD and WFC databases on fish distribution
AK	FP_Part_no	Process score for fish passage project with partial barrier and on a creek with no documented salmon or trout presence; barriers with passage unknown or not defined were considered partial barriers	User input based on BlockageD entry in column AC and SWIFD and WFC databases on fish distribution
AL	Process_SS	Overall process score for Sediment Supply restoration or protection projects. Scored per formula and uses information in columns S, W, and X.	Formula in database will calculate this number. Entry only need for action type(s) addressed by the project.
AM	Process_ST	Overall process score for Sediment Transport restoration or protection projects. Scored per formula and uses information in columns S, W, and X.	Formula in database will calculate this number. Entry only need for action type(s) addressed by the project.
AN	Process_XS	Overall process score for Cross-shore Connectivity restoration or protection projects.	Formula in database will calculate this number. Entry only need for action type(s) addressed by the project.
AO	Process_TF	Overall process score for Tidal Flow restoration or protection projects. Scored per formula and uses information in column Y.	Formula in database will calculate this number. Entry only need for action type(s) addressed by the project.
AP	Process_FP	Overall process score for Fish Passage restoration projects. Scored per formula and uses information in columns AD through AK.	Formula in database will calculate this number. Entry only need for action type(s) addressed by the project.
AQ	DCGRP	Drift cell group assignment from East Kitsap and Bainbridge Island assessments with interpretations for Pierce County portion of project area. Category 3 = high degradation, 2 = moderate degradation, and 1 = low degradation.	User input based on DCGRP entry in parcel database
AR	Suit_DCG	Sustainability in Area score in suitability portion of the formula.	User input per scoring formula; based on column AQ.

Excel Column	Field Name	Description	Instructions for Populating Spreadsheet for Any New Projects Added
AS	Match_RSed	Match to Management Strategy score for sediment restoration projects (SS, ST, XS) in the suitability portion of the formula.	User input per scoring formula; based on information on reach priority in column V. Input will be 3.0, 1.5, or 1.0.
AT	Match_RTF	Match to Management Strategy score for tidal flow restoration projects in suitability portion of the formula.	User input per scoring formula; based on information on reach priority in column V. Input will be 3.0, 1.5, or 1.0.
AU	Match_RFP	Match to Management Strategy score for fish passage restoration projects in suitability portion of the formula.	User input per scoring formula; based on information on reach priority in column V. Input will be 3.0, 1.5, or 1.0.
AV	Match_Psed	Match to Management Strategy score for sediment protection projects (SS, ST, XS) in suitability portion of the formula.	User input per scoring formula; based on information on reach priority in column V. Input will be 3.0, 1.5, or 1.0.
AW	Match_PTF	Match to Management Strategy score for tidal flow protection projects in suitability portion of the formula.	User input per scoring formula; based on information on reach priority in column V. Input will be 3.0, 1.5, or 1.0.
AX	Mgmt_Match	Match to Nearshore Assessment Management Recommendation.	User input per scoring formula; based on information on drift cell priority in column "Management" in the parcel database. Input will be 1.0 or 0.0.
AY	Suit_RSed	Overall suitability score for sediment restoration projects (SS, ST, XS)	Formula in database will calculate this number. Entry only need for action type(s) addressed by the project.
AZ	Suit_RTF	Overall suitability score for tidal flow restoration projects	Formula in database will calculate this number. Entry only need for action type(s) addressed by the project.
BA	Suit_RFP	Overall suitability score for fish passage restoration projects	Formula in database will calculate this number. Entry only need for action type(s) addressed by the project.
BB	Suit_Psed	Overall suitability score for sediment protection projects (SS, ST, XS)	Formula in database will calculate this number. Entry only need for action type(s) addressed by the project.
BC	Suit_PTF	Overall suitability score for tidal flow protection projects	Formula in database will calculate this number. Entry only need for action type(s) addressed by the project.
BD	EELGRASS	WDNR ShoreZone Inventory information on presence of eelgrass	User input based on interpretation of WDNR ShoreZone Inventory (2001) eelgrass data
BE	EG_Site	1 = yes there is eelgrass present onsite based on EELGRASS field entries of "patchy" or "continuous", 0 = no.	User input based on column BD

Excel Column	Field Name	Description	Instructions for Populating Spreadsheet for Any New Projects Added
BF	EG_DD	Indication of whether eelgrass is present downdrift in drift cell. 1 = yes. 0 = no.	User input based of EGDdSegmen field in parcel database
BG	EG_Sed	Structure & Function score for eelgrass in sediment projects	Formula in database will calculate this number based on information in columns BE and BF
BH	EG_TF	Structure & Function score for eelgrass in tidal flow projects	Formula in database will calculate this number based on information in columns BE
BI	SS_Spawn	1 = yes there is documented surf smelt spawning onsite, 0 = no	User input based on SSSA field in parcel database (PHS 2014 originally)
BJ	PSL_Spawn	1 = yes there is documented Pacific sand lance spawning onsite, 0 = no	User input based on PLSA field in parcel database (PHS 2014 originally)
BK	PH_Spawn	1 = yes there is documented Pacific herring spawning in waters offshore of site, 0 = no	User input based on PHSA field in parcel database (PHS 2014 originally)
BL	SS_DD	0.5 = yes there is documented surf smelt spawning downdrift in drift cell, 0 = no	n/a
BM	PSL_DD	0.5 = yes there is documented sand lance spawning downdrift in drift cell, 0 = no	n/a
BN	Ffish_Sed	Structure & Function score for forage fish spawning in sediment projects	Formula in database will calculate this number based on information in columns BI, BJ, BK, BL, and BM
BO	Ffish_TF	Structure & Function score for forage fish spawning in tidal flow projects	Formula in database will calculate this number based on information in columns BI, BJ, and BK
BP	RipVeg_Sc	Structure & Function score for riparian vegetation. 1 if riparian vegetation of classes Closed Canopy, Mature Forest, and Other Natural Vegetation cover 50% or more of assessment unit the site occurs in, 0 = no	User input based on PNPTC riparian analysis or aerial imagery interpretation
BQ	Wetland_up	y if freshwater wetland occurs within lowermost 650 ft of stream, n if not	User input based on data from NWI, Kitsap County, and Pierce County
BR	Estuary_up	y if estuarine habitats exist upstream of a fish passage barrier, n if not	User input based on PSNERP tidal wetlands
BS	Wetl_FP	Structure & Function score for freshwater wetlands. 2 if freshwater wetland occurs within lowermost 650 ft of stream with a fish passage barrier, 0 if not	User input per scoring formula based on information in column BN
BT	Estuary_FP	Structure & Function score for estuaries upstream. 2 if estuarine habitats exist upstream of a fish passage barrier, 0 if not	User input per scoring formula based on information in column BO
BU	StrFn_SedTF	Overall structure & function score for sediment projects; scored per formula based on columns BG, BN, and BP.	Formula in database will calculate this number or user input can be used to apply formula.
BV	StrFn_TF	Overall structure & function score for tidal flow projects; scored per formula based on columns BG, BN, and BP.	Formula in database will calculate this number or user input can be used to apply formula.

Excel Column	Field Name	Description	Instructions for Populating Spreadsheet for Any New Projects Added
BW	StrFn_FP	Overall structure and function score for fish passage restoration projects; scored per formula based on columns BP, BS, and BT.	Formula in database will calculate this number or user input can be used to apply formula.
BX	Armor_SS	Length of armor removal in parcel for sediment supply restoration (i.e., in front of feeder bluffs)	User input based on armor length from County's armoring dataset and Ecology's feeder bluff mapping database (available on Digital Coastal Atlas website)
BY	Armor_ST	Length of armor removal in parcel for sediment transport restoration (i.e., in front of transition zones and not feeder bluffs)	User input based on armor length from County's armoring dataset and Ecology's feeder bluff mapping database (available on Digital Coastal Atlas website)
BZ	Armor_XS	Length of armor removal in parcel for cross-shore connectivity restoration (i.e., in shoreline areas with no appreciable drift)	User input based on armor length from County's armoring dataset and Ecology's feeder bluff mapping database (available on Digital Coastal Atlas website)
CA	TF_BeneAc	Estimated acreage of tidal flow restoration in overall project	User input based on interpretation of restoration area informed by historic t-sheet mapping data and PSNERP historic tidal wetland data. Estimated area of tidal wetland area benefitting from project.
CB	Expand_Est	Yes (y) if fish passage barrier to be removed is at mouth of creek and includes opportunity to expand estuary connectivity, no (n) if not	User input based on interpretation of whether barrier is at mouth of creek and would allow expansion of the estuary
CC	MoreCulvrt	Yes (y) if there are other fish passage barriers in lower 650 ft of creek, no (n) if not	User input based on WDFW and WFC barrier databases
CD	FP_estuary	Size score for expanding estuary with removal of fish passage barrier. Scored per formula based on column CB	User input per scoring formula based on information in column BX
CE	FP_Distanc	Size score for presence/absence of other fish passage barriers in lower 650 ft of creek. Scored per formula based on column CC	User input per scoring formula based on information in column BY
CF	Prj_Sz_RFP	Overall size score for fish passage restoration projects. Scored per formula based on columns CD and CE.	Formula in database will calculate this number or user input can be used to apply formula.
CG	TF_Wetl_Sz	Estimated acreage of tidal flow protection by overall project	User input based on interpretation of tidal flow protection area and informed by PSNERP tidal wetland data. Estimated area of tidal wetland area benefitting from project.
CH	Prj_Sz_RSS	Length of armor removal in project for sediment supply restoration (i.e., in front of feeder bluffs). Based on sum of column BX among all contributing parcels.	User input based on sum of armor length in all contributing parcels in column BX

Excel Column	Field Name	Description	Instructions for Populating Spreadsheet for Any New Projects Added
CI	Prj_Sz_RST	Length of armor removal in project for sediment transport restoration (i.e., in front of transition zones and not feeder bluffs). Based on sum of column BY among contributing parcels.	User input based on sum of armor length in all contributing parcels in column BY
CJ	Prj_Sz_RXS	Length of armor removal in project for cross-shore connectivity restoration (i.e., in shoreline areas with no appreciable drift). Based on sum of column BZ among contributing parcels.	User input based on sum of armor length in all contributing parcels in column BZ
CK	Prj_Sz_RTF	Estimated acreage of tidal flow restoration.	User input based on interpretation of tidal flow restoration area and informed by PSNERP tidal wetland data
CL	Prj_Sz_PSS	Length of shoreline in project for sediment supply protection (i.e., in front of feeder bluffs). Based on sum of column BX among all contributing parcels.	User input based on length of unarmored shoreline in sediment supply areas in all contributing parcels
CM	Prj_Sz_PST	Length of shoreline in project for sediment transport protection (i.e., in front of transition zones and not feeder bluffs). Based on sum of column BY among contributing parcels.	User input based on sum of armor length in sediment transport areas in all contributing parcels
CN	Prj_Sz_PXS	Length of shoreline in project for cross-shore connectivity protection (i.e., in shoreline areas with no appreciable drift). Based on sum of column BZ among contributing parcels.	User input based on sum of armor length in cross-shore sediment areas in all contributing parcels
CO	Prj_Sz_PTF	Estimated acreage of tidal flow protection to use in scoring formula.	User input based on column CG. Maximum input for acreage is 5.0 based on maximum score rules.
CP	Size_R_SS	Overall size score for sediment supply restoration projects. Scored per formula based on length of armor removal in project (i.e., sum of parcel lengths) for sediment supply restoration (i.e., in front of feeder bluffs). Based on column CH.	Formula in database will calculate this number based on column CH
CQ	Size_R_ST	Overall size score for sediment transport restoration projects. Scored per formula based on length of armor removal in project (i.e., sum of parcel lengths) for sediment transport restoration (i.e., in front of transition zones and not feeder bluffs). Based on column CI.	Formula in database will calculate this number based on column CI.
CR	Size_R_XS	Overall size score for cross-shore connectivity restoration projects. Scored per formula based on length of armor removal in project (i.e., sum of parcel lengths) for cross-shore connectivity restoration (i.e., in shoreline areas with no appreciable drift). Based on column CJ.	Formula in database will calculate this number based on column CJ.
CS	Size_RTF_6	Overall size score for tidal flow restoration projects. Scored per formula based on acreage of tidal flow restoration. Based on column CK.	Formula in database will calculate this number based on column CK
CT	Size_PSS_6	Overall size score for sediment supply protection projects. Scored per formula based on length of unarmored shoreline in project (i.e., sum of parcel lengths).	Formula in database will calculate this number based on column CL

Excel Column	Field Name	Description	Instructions for Populating Spreadsheet for Any New Projects Added
CU	Size_PST_6	Overall size score for sediment transport protection projects. Scored per formula based on length of unarmored shoreline in project (i.e., sum of parcel lengths).	Formula in database will calculate this number based on column CM
CV	Size_PXS_6	Overall size score for cross-shore sediment protection projects. Scored per formula based on length of unarmored shoreline in project (i.e., sum of parcel lengths).	Formula in database will calculate this number based on column CN
CW	Size_PTF_M6	Overall size score for tidal flow protection projects. Scored per formula based on column CO.	Formula in database will calculate this number based on column CO
CX	Prc_Sz_PSS	Shoreline length (in feet) in parcel for protection of sediment supply	User input based on shoreline length in parcel that is in sediment supply area
CY	Prc_Sz_PST	Shoreline length (in feet) in parcel for protection of sediment transport	User input based on shoreline length in parcel that is in sediment transport area
CZ	Prc_Sz_PXS	Shoreline length (in feet) in parcel for protection of cross-shore sediment	User input based on shoreline length in parcel that is in cross-shore sediment area
DA	Prc_Sz_PTF	Area (in acres) in parcel with tidal wetland that would be protected	User input based on tidal wetland area in parcel
DB	Parc_Score	Total score if project included only the one parcel being evaluated. Scored per formula.	Formula in database will calculate this number
DC	Prj_R_SS	Score of project for sediment supply restoration portion of project based on overall project size and computed with parcel specific calculations for process, suitability, and structure and function. Based on columns F, AL, AY, BU, and CP.	Formula in database will calculate this number
DD	Prj_R_ST	Score of project for sediment transport restoration portion of project based on overall project size and computed with parcel specific calculations for process, suitability, and structure and function. Based on columns G, AM, AY, BU, and CQ.	Formula in database will calculate this number.
DE	Prj_R_XS	Score of project for cross-shore connectivity restoration portion of project based on overall project size and computed with parcel specific calculations for process, suitability, and structure and function. Based on columns H, AN, AY, BU, and CR.	Formula in database will calculate this number.
DF	Prj_R_TF	Score of project for tidal flow restoration portion of project based on overall project size and computed with parcel specific calculations for process, suitability, and structure and function. Based on columns I, AO, AZ, BV, and CS.	Formula in database will calculate this number

Excel Column	Field Name	Description	Instructions for Populating Spreadsheet for Any New Projects Added
DG	Prj_R_FP	Score of project for fish passage restoration portion of project based on overall project size and computed with parcel specific calculations for process, suitability, and structure and function. Based on columns J, AP, BA, BW, and CF.	Formula in database will calculate this number.
DH	Prj_P_SS	Score of project for sediment supply protection portion of project based on overall project size and computed with parcel specific calculations for process, suitability, and structure and function. Based on columns K, AL, BB, BU, and CT.	Formula in database will calculate this number
DI	Prj_P_ST	Score of project for sediment transport protection portion of project based on overall project size and computed with parcel specific calculations for process, suitability, and structure and function. Based on columns L, AM, BB, BU, and CU.	Formula in database will calculate this number
DJ	Prj_P_XS	Score of project for cross-shore connectivity protection portion of project based on overall project size and computed with parcel specific calculations for process, suitability, and structure and function. Based on columns M, AN, BB, BU, and CV.	Formula in database will calculate this number.
DK	Prj_P_TF	Score of project for tidal flow protection portion of project based on overall project size and computed with parcel specific calculations for process, suitability, and structure and function. Based on columns N, AO, BC, BV, and CW.	Formula in database will calculate this number.
DL	Prj_Score	Total score for project based on all contributing parcels. Calculated as the sum of the highest score of each project type among contributing parcels.	User input based on sum of the maximum scores of each action type among all contributing parcels
DM	Parcel_Tier	Indicates the priority tier if the project action was only carried out on the individual parcel	Assigned based on tier divisions described in main report. Same scoring breaks used for parcels and projects
DN	Priority	Indicates the priority tier the project was assigned to.	Assigned based on tier divisions described in main report. Same scoring breaks used for parcels and projects

3.0 USING THE PARCEL DATABASE

The parcel database provides compiled data for all shoreline parcels in the project area. A subset of these are used in the prioritization framework. Table B-2 describes the fields in the parcel database that are used in the prioritization framework.

Table B-2. Fields in Parcel Database with Information Used in Prioritization Framework

Database Field	Description
DD_Pct	Counterpart to DD_Percent in project database. Proportion of drift cell length that is downdrift
DDMbay	Counterpart to DD_embay in project database. 1 = yes there is an embayment downdrift, 0 = no
DCGRP	Same as DCGRP in project database. Drift cell group assignment from East Kitsap and Bainbridge Island assessments with interpretations for Pierce County portion of project area. Category 3 = high degradation, 2 = moderate degradation, and 1 = low degradation.
Management	Counterpart to Mgmt_Match in project database. Suitability score for match of project prescription to management recommendation portion of the overall suitability score. Data from East Kitsap Nearshore Assessment; Borde et al. 2009 Appendix D.
EELGRASS	Same as EELGRASS in project database. WDNR ShoreZone Inventory information on presence of eelgrass
EGDdSegmen	Counterpart to EG_DD in project database. Indication of whether eelgrass is present downdrift in drift cell. 1 = yes. 0 = no.
SSSA	Counterpart to SS_Spawn in project database. 1 = yes there is documented surf smelt spawning onsite, 0 = no
PSLSA	Counterpart to PSL_Spawn in project database. 1 = yes there is documented Pacific sand lance spawning onsite, 0 = no
PHSA	Counterpart to PH_Spawn in project database. 1 = yes there is documented Pacific herring spawning in waters offshore of site, 0 = no
TF_BeneAc	Same as TF_BeneAc in project database. Estimated acreage of tidal flow restoration.
BlockageD	Same as BlockageD in project database. Description of fish passage blockage.

4.0 PRIORITIZATION FRAMEWORK FORMULA AND SCORING

The prioritization framework presented in the main report is copied below for ease of use with the user guide. See Section 4 of the main report for more information on the prioritization framework. See main report for reference citations.

The framework includes four components:

- benefits to process (Table B-3)
- site suitability (Table B-4)
- benefits to structure and function (Table B-5)
- size (Table B-6)

Each component includes multiple contributing metrics. The formula for the framework is:

$$\text{Score} = [(\text{Process} * \text{Suitability}) + (\text{Structure and Function})] * \text{Size}$$

Table B-3. Scoring Rules for the Process Component of the Prioritization Framework

Process Score by Project Type	Scoring	Data Sources Used to Inform Scoring
Sediment Supply (SS)	2	
	+	
	(3 * proportion of drift cell length located downdrift of project in a priority drift cell)	Used Ecology drift cell data (Shipman et al. 2014) and calculated site location within drift cell. Priority drift cells based on integrated priorities described in Section 3.0.
	+	
	(1 * proportion of drift cell length located downdrift of project in a moderate priority drift cell)	
+		
1 if project benefits accretion shoreform protecting an embayment	Used MacLennan et al. (2013) feeder bluff mapping which included identification of accretion shoreforms	
Sediment Transport (ST)	1	
	+	
	(1.5 * proportion of drift cell length located downdrift of project in a priority drift cell)	Used Ecology drift cell data (Shipman et al. 2014) and calculated site location within drift cell. Priority drift cells based on integrated priorities described in Section 3.0.
	+	
	(0.5 * proportion of drift cell length located downdrift of project in a moderate priority drift cell)	
+		
1 if project benefits accretion shoreform protecting an embayment	Used MacLennan et al. (2013) feeder bluff mapping which included identification of accretion shoreforms	
Tidal Flow (TF)	3	
	+	
	1 if project restores tidal connectivity to an existing embayment	PSNERP mapping (Simenstad et al. 2011) and aerial imagery interpretation
Fish Passage (FP)	6 if project addresses full barrier on salmon-bearing stream	Presence of barrier and degree of fish passage blockage based on the WDFW Fish Passage Barrier database (WDFW 2016) and Wild Fish Conservancy (2014) Water Typing inventory of barriers. Fish use information is based on the WDFW and NWIFC Statewide Washington Integrated Fish Distribution database (2014) and Wild Fish Conservancy Water Typing inventory of fish presence.
	4 if project addresses partial barrier on salmon-bearing stream	
	3 if project addresses full barrier on cutthroat trout stream	
	2 if project addresses partial barrier on cutthroat trout stream	
	1 if project addresses full barrier on non-salmon-bearing stream	
	1 if project addresses partial barrier on non-salmon-bearing stream	
Cross-Shore Connectivity (XS)	1	
Other Project Types	1	

Table B-4. Scoring Rules for the Suitability Component of the Prioritization Framework

Suitability Metric for All Project Types	Scoring	Data Sources Used to Inform Scoring
Match to Management Strategy	3 if restoration action in restoration priority reach for that type of project	Priority reaches based on integrated priorities described in Section 3.0.
	3 if protection action in protection priority reach for that type of project	
	1.5 if restoration action in protection priority reach for that type of project	
	1.5 if restoration action in restoration priority reach for a different type of project	
	1.5 if protection action in restoration priority reach for that type of project	
	1.5 if protection action in protection priority reach for a different type of project	
	1 if not in a priority reach	
Match to Nearshore Assessment Management Recommendation	1 if project prescription (e.g., protect, restore) matches assigned management recommendation or addresses an identified fish passage barrier	Management recommendations from East Kitsap Nearshore Inventory (EKNI; Borde et al. 2009), City of Bainbridge Island Nearshore Inventory (Williams et al. 2004), and Key Peninsula Nearshore Inventory (Pentec 2003)
Sustainability in Area	1 if drift cell score in EKNI study = 1 (i.e., low degradation of drift cell)	Drift cell degradation analysis in EKNI (Borde et al. 2009), City of Bainbridge Island Nearshore Inventory (Williams et al. 2004) and interpreted from analysis in Key Peninsula Nearshore Inventory (Pentec 2003)
	0.5 if drift cell score in EKNI study = 2 (i.e., moderate degradation of drift cell)	
	0 if drift cell score in EKNI study = 3 (i.e., high degradation of drift cell)	

Table B-5. Scoring Rules for the Structure and Function Component of the Prioritization Framework

Structure & Function Score by Project Type	Scoring	Data Sources Used to Inform Scoring
Sediment Supply, Sediment Transport, or Cross-Shore Connectivity	1 if eelgrass is onsite and an additional 0.5 if eelgrass is downdrift	WDNR ShoreZone Inventory (2001) with analysis of downdrift eelgrass within drift cell
	+	
	1 for each forage fish species (surf smelt, Pacific sand lance, and Pacific herring) documented spawning at project site	WDFW Forage Fish Spawning database (2016) with analysis of downdrift spawning within drift cell
	+	
	0.5 for each forage fish species (surf smelt, Pacific sand lance, and Pacific herring) documented spawning downdrift of the project site and an additional 0.5 points if spawning has been documented in multiple sites downdrift	
+		

Structure & Function Score by Project Type	Scoring	Data Sources Used to Inform Scoring
	1 if closed canopy and other natural vegetation occurs in more than 50% of the 200 ft shoreline buffer	Point No Point Treaty Council (PNPTC) Riparian Land Cover Vegetation Study (2015) for Kitsap County areas and analysis of aerial imagery to characterize riparian vegetation in Pierce County
Tidal Flow	1 if eelgrass is onsite	WDNR ShoreZone Inventory (2001) with analysis of downdrift eelgrass within drift cell
	+	
	1 for each forage fish species (surf smelt, Pacific sand lance, and Pacific herring) documented spawning at project site	WDFW Forage Fish Spawning database (2016) with analysis of downdrift spawning within drift cell
	+	
	1 if closed canopy and other natural vegetation occurs in more than 50% of the 200 ft shoreline buffer	PNPTC Riparian Land Cover Vegetation Study (2015) for Kitsap County areas and analysis of aerial imagery to characterize riparian vegetation in Pierce County
Fish Passage	2 if documented freshwater wetlands within 650 ft upstream of barrier	U.S. Fish and Wildlife Service National Wetland Inventory data (2016) and wetland data from Kitsap County and Pierce County
	+	
	2 if documented tidal wetlands within 650 ft upstream of barrier	PSNERP current tidal wetlands data (Simenstad et al. 2011)
	+	
	1 if closed canopy and other natural vegetation occurs in more than 50% of the 200 ft shoreline buffer	PNPTC Riparian Land Cover Vegetation Study (2015) for Kitsap County areas and analysis of aerial imagery to characterize riparian vegetation in Pierce County
Other Project Types	1 if eelgrass is onsite and an additional 0.5 if eelgrass is downdrift	WDNR ShoreZone Inventory (2001) with analysis of downdrift eelgrass within drift cell
	+	
	1 for each forage fish species (surf smelt, Pacific sand lance, and Pacific herring) documented spawning at project site	WDFW Forage Fish Spawning database (2016) with analysis of downdrift spawning within drift cell
	+	
	1 if closed canopy and other natural vegetation occurs in more than 50% of the 200 ft shoreline buffer	PNPTC Riparian Land Cover Vegetation Study (2015) for Kitsap County areas and analysis of aerial imagery to characterize riparian vegetation in Pierce County

Table B-6. Scoring Rules for the Size Component of the Prioritization Framework

Size by Project Type	Scoring	Data Sources Used to Inform Scoring
Sediment Supply, Sediment Transport, or Cross-shore Connectivity	1 + (shoreline armor removal length/500 ft); maximum score of 6	Armor dataset compiled by Kitsap County for restoration projects and shoreline length for protection projects
Tidal Flow	1 + (tidal inundation area/1 acre); maximum score of 6	PSNERP tidal wetland area (Simenstad et al. 2011) with interpretation of realistic project area based on infrastructure
Fish Passage	1	
	+	
	2 if there are no other barriers within the lowermost 650 ft of the creek	WDFW Fish Passage Barrier database and Wild Fish Conservancy Water Typing inventory of barriers.
	+	
	2 if the barrier is at creek mouth and (thus restricting access to entire estuary) and/or restricts the size of the estuary	Interpretation of aerial imagery
Other project types	1	

Appendix C

Scoring Summary for Each Project

Project ID	Site Name	Opportunity	Overall Project Score	Restore SS					Restore ST					Restore XS					Restore TF					Restore FP				
				Process	Suitability	Structure & Function	Size	Score	Process	Suitability	Structure & Function	Size	Score	Process	Suitability	Structure & Function	Size	Score	Process	Suitability	Structure & Function	Size	Score	Process	Suitability	Structure & Function	Size	Score
2070	Liberty Bay	Rest-XS	5.37											1.00	1.50	1.0	2.15	5.37										
2071	Liberty Bay	Rest-ST	8.39						2.20	2.50	0.0	1.52	8.39															
2073	Johnson Creek	Rest-ST-TF	25.68						2.39	2.50	0.0	2.67	16.00						3.00	2.50	0.0	1.29	9.68					
2074	Viking Way	Rest-FP	15.00																				6.00	2.50	0.0	1.00	15.00	
2075	South of Johnson Creek	Rest-ST	10.21						2.57	2.50	0.0	1.59	10.21															
2076	South of Johnson Creek	Rest-ST	20.89						2.79	2.50	2.5	2.21	20.89															
2077	North of Big Scandia Creek	Rest-ST	21.75						3.39	2.50	1.5	2.18	21.75															
2078	Little Scandia Creek Eastern Point	Rest-ST	10.77						1.48	2.50	2.5	1.73	10.77															
2079	Little Scandia Creek at NW Scandia Rd	Rest-FP	30.00																			4.00	2.50	0.0	3.00	30.00		
2080	Little Scandia Creek at NW Lindquist Ln	Rest-ST	11.92						1.97	2.50	1.5	1.86	11.92															
2082	Pearson Point Rd NE	Rest-TF	10.00																4.00	2.50	0.0	1.00	10.00					
2083	Pearson Point	Rest-ST	11.56						2.14	2.50	2.5	1.47	11.56															
2084	Dogfish Bay SR 308	Rest-FP-TF	23.84																4.00	2.00	0.0	2.23	17.84	3.00	2.00	0.0	1.00	6.00
2085	West Dogfish Bay Larm Rd NE	Rest-ST	3.25						2.20	1.00	0.0	1.48	3.25															
2086	Dogfish Bay Daniels Creek	Rest-FP	27.00																			4.00	2.00	1.0	3.00	27.00		
2087	West of Keyport	Rest-ST	4.18						2.59	1.00	1.0	1.16	4.18															
2088	Keyport	Rest-ST-TF	57.95						1.16	1.00	2.5	6.00	21.95						4.00	1.00	2.0	6.00	36.00					
2089	Brownsville	Rest-ST-TF-FP	102.19						1.00	3.00	4.0	2.74	19.19						3.00	3.00	4.0	1.00	13.00	4.00	3.00	2.0	5.00	70.00
2091	Steele Creek	Rest-FP-TF	78.00																4.00	3.00	1.0	1.00	13.00	4.00	3.00	1.0	5.00	65.00
2092	South of Brownsville	Rest-FP	7.50																			1.00	2.50	0.0	3.00	7.50		
2093	Gilberton at Arizona St	Rest-SS	7.70	4.10	1.00	2.0	1.26	7.70																				
2094	Gilberton at Grahns Ln NE	Rest-XS-TF	17.14											1.00	3.00	3.0	1.36	8.14	4.00	1.50	3.0	1.00	9.00					
2095	Gilberton	Rest-ST-XS	14.53						2.17	3.00	2.0	1.04	8.89	1.00	3.00	2.0	1.13	5.64										
2096	Port Orchard Bay	Rest-SS	26.87	3.49	3.00	2.0	2.16	26.87																				
2097	North of Illahee	Rest-SS	8.80	3.92	1.00	2.5	1.37	8.80																				
2098	Illahaee Creek	Rest-FP	25.00																			4.00	1.00	1.0	5.00	25.00		
2099	North of Illahee State Park at Rue Villa NE	Rest-ST	8.41						2.72	1.00	2.5	1.61	8.41															
2100	North of Illahee State Park at Rue Villa NE	Rest-ST	6.29						2.75	1.00	2.5	1.20	6.29															
2101	North of Illahee State Park at Loretta Ln	Rest-ST	11.25						2.77	1.00	3.5	1.79	11.25															
2102	North of Illahee State Park at NE Steinman Ln	Rest-ST	6.36						2.80	1.00	1.5	1.48	6.36															
2103	Illahaee State Park	Rest-ST	28.75						2.85	3.00	4.5	2.20	28.75															
2104	Enetai	Rest-ST-TF	35.85						3.05	3.00	3.5	2.32	29.35						3.00	1.50	2.0	1.00	6.50					
2105	North of Enetai Creek	Rest-ST	17.21						3.20	3.00	2.5	1.42	17.21															
2108	Enetai Creek	Rest-FP	24.00																			4.00	2.00	0.0	3.00	24.00		
2109	South of Enetai Creek	Rest-ST	7.71						3.24	1.00	2.5	1.34	7.71															
2110	Enetai North Jacobson Blvd	Rest-ST	7.27						3.26	1.00	2.5	1.26	7.27															
2111	Enetai North Jacobson Blvd	Rest-ST	6.99						3.27	1.00	2.5	1.21	6.99															
2112	Enetai South Jacobson Blvd	Rest-ST	8.00						3.32	1.00	2.5	1.37	8.00															
2113	Enetai South Jacobson Blvd	Rest-ST	5.56						3.35	1.00	1.5	1.15	5.56															
2115	East Park	Rest-SS	16.76	4.09	3.00	1.0	1.26	16.76																				
2116	East Park	Rest-SS	18.90	3.98	3.00	1.0	1.46	18.90																				
2117	Lebo	Rest-SS-ST-FP	26.76	3.39	3.00	0.0	1.22	12.39	3.23	1.00	1.0	1.98	8.37									1.00	2.00	0.0	3.00	6.00		
2118	Tracyton	Rest-ST	13.46						3.41	1.50	1.0	2.20	13.46															
2119	Tracyton Mosher Creek	Rest-ST	18.59						3.29	1.00	2.0	3.51	18.59															
2120	Tracyton Vanishing Way	Rest-ST	11.04						3.08	1.00	2.0	2.17	11.04															
2121	North of Tracyton	Rest-ST	9.55						2.95	1.00	2.0	1.93	9.55															
2122	North of Tracyton	Rest-SS	10.54	4.87	1.00	1.0	1.79	10.54																				
2124	South of Windy Point	Rest-ST	8.86						2.82	1.00	3.0	1.52	8.86															
2125	Tracyton, Dyes	Rest-SS	14.08	4.54	1.00	2.0	2.15	14.08																				
2126	Windy Point	Rest-ST	25.69						2.70	3.00	3.0	2.31	25.69															
2127	North of Windy Point	Rest-SS	19.31	4.25	3.00	2.0	1.31	19.31																				
2129	Silverdale at Tracyton Blvd	Rest-ST	12.79						2.20	1.00	1.5	3.45	12.79															
2130	Silverdale at Mickleberry Rd	Rest-ST-TF	95.99						2.13	1.50	2.5	3.58	20.39						4.00	3.00	2.0	5.40	75.60					
2131	Silverdale at Bucklin Hill Rd	Rest-XS-TF	20.68											1.00	1.00	1.0	4.28	8.56	3.00	1.00	1.0	3.03	12.12					
2132	Silverdale at McConnell	Rest-ST	8.46						1.41	1.00	4.5	1.43	8.46															
2133	Newberry Hill Koch Creek Shoreline	Rest-ST-TF	16.37						1.73	3.00	2.5	1.34	10.32						3.00	1.50	1.0	1.10	6.05					
2134	Newberry Hill Koch Creek at Chico Way	Rest-FP	15.00																			6.00	2.50	0.0	1.00	15.00		
2135	Newberry Hill Koch Creek	Rest-FP	12.00																			6.00	2.00	0.0	1.00	12.00		
2138	Newberry Hill	Rest-SS	19.73	3.86	3.00	2.5	1.40	19.73																				
2139	West Dyes Inlet North Chico Way NW Woods Creek	Rest-FP	9.00																			3.00	3.00	0.0	1.00	9.00		
2140	Woods Creek	Rest-FP	7.50																			3.00	2.50	0.0	1.00	7.50		
2142	West Dyes Inlet Chico	Rest-ST	23.28						3.31	4.50	2.5	1.34	23.28															
2143	West Dyes Inlet South Chico Way NW	Rest-FP	45.00																			6.00	2.50	0.0	3.00	45.00		
2144	West Dyes Inlet Hwy 3	Rest-FP	12.00																			6.00	2.00	0.0	1.00	12.00		
2145	West Dyes Inlet Chico	Rest-SS	42.33	5.40	4.50	1.5	1.64	42.33																				
2148	West Dyes Inlet Chico Way NW	Rest-FP	8.00																			4.00	2.00	0.0	1.00	8.00		
2149	West Chico Bay	Rest-ST	16.21						2.27	3.00	0.0	2.38	16.21															
2150	West Chico Bay	Rest-ST	3.44						2.08	1.50	0.0	1.10	3.44															
2151	Chico Bay Kitsap County Parks	Rest-XS	3.97											1.00	1.50	1.0	1.59	3.97										
2153	Chico	Rest-FP	65.00																			4.00	2.50	3.0	5.00	65.00		
2154	East Chico Bay	Rest-XS	1.84											1.00	1.50	0.0	1.23	1.84										
2155	East Chico Bay	Rest-XS	1.74											1.00	1.50	0.0	1.16	1.74										

Project ID	Site Name	Opportunity	Overall Project Score	Restore SS					Restore ST					Restore XS					Restore TF					Restore FP				
				Process	Suitability	Structure & Function	Size	Score	Process	Suitability	Structure & Function	Size	Score	Process	Suitability	Structure & Function	Size	Score	Process	Suitability	Structure & Function	Size	Score	Process	Suitability	Structure & Function	Size	Score
2160	South Elands Point at Tanda Ave NW	Rest-ST	6.28						1.52	2.50	1.5	1.19	6.28															
2161	South Elands Point at Tanda Ave NW	Rest-ST	7.77						1.65	2.50	1.5	1.38	7.77															
2162	South Elands Point at NW Paul Benjamin Rd	Rest-ST	25.17						2.27	3.00	2.5	2.70	25.17															
2163	Jackson Park	Rest-ST	57.30						3.02	2.50	2.0	6.00	57.30															
2164	NAD Marine Park	Rest-SS	39.54	3.84	2.50	1.0	3.73	39.54																				
2168	West Marine Drive	Rest-SS	6.61	2.98	1.00	2.0	1.33	6.61																				
2169	Northwest Marine Drive	Rest-ST	6.62						1.40	2.50	2.0	1.20	6.62															
2170	North Marine Drive	Rest-ST	39.05						3.50	2.50	3.0	3.33	39.05															
2171	North Marine Drive	Rest-ST	11.38						3.31	2.50	1.5	1.16	11.38															
2172	Northwest Mud Bay	Rest-ST	13.84						3.18	2.50	1.0	1.54	13.84															
2173	West Mud Bay at Fitz Dr	Rest-ST	18.94						2.91	2.50	1.0	2.29	18.94															
2174	West Mud Bay at Marine Drive	Rest-ST	7.40						2.62	2.50	0.0	1.13	7.40															
2175	West Mud Bay at Marine Drive	Rest-ST	6.65						2.27	2.50	0.0	1.17	6.65															
2176	Southwest Mud Bay at The Cedars	Rest-XS	4.30											1.00	2.50	1.0	1.23	4.30										
2177	West Rocky Point NW Swiftshore CT	Rest-ST	12.67						3.05	3.00	0.0	1.38	12.67															
2178	East Rocky Point Bass Point	Rest-XS	2.96											1.00	2.50	0.0	1.18	2.96										
2179	East Rocky Point Bass Point	Rest-XS	7.72											1.00	3.00	1.0	1.93	7.72										
2180	East Rocky Point NW Drury Ln	Rest-ST	6.30						1.52	2.50	1.5	1.19	6.30															
2181	East Rocky Point	Rest-ST	6.49						1.95	2.50	0.5	1.21	6.49															
2182	East Rocky Point NW Sparrow Wy	Rest-ST	11.61						3.50	2.50	0.5	1.26	11.61															
2183	East Rocky Point	Rest-ST	11.56						3.15	2.50	1.5	1.23	11.56															
2184	East Rocky Point NW Chrey Ln	Rest-ST	9.65						3.02	2.50	0.5	1.20	9.65															
2185	Rocky Point	Rest-TF	84.00																4.00	3.50	0.0	6.00	84.00					
2186	Bremerton Yacht Club	Rest-TF	96.00																4.00	3.50	2.0	6.00	96.00					
2187	Phinney Bay	Rest-XS	6.21											1.00	3.50	1.0	1.38	6.21										
2188	Phinney Bay	Rest-XS	6.01											1.00	3.50	2.0	1.09	6.01										
2189	Southside Port Washington Narrows	Rest-XS	2.98											1.00	2.50	0.0	1.19	2.98										
2190	Southside Port Washington Narrows Snyder Ave	Rest-SS	6.66	2.00	2.50	0.0	1.33	6.66																				
2191	Southside Port Washington Narrows 19th Street	Rest-SS	12.42	2.99	3.00	1.5	1.19	12.42																				
2192	Southside Port Washington Narrows Thompson Dr	Rest-SS	8.22	3.45	1.00	1.5	1.66	8.22																				
2193	Southside Port Washington Narrows Chester Ave	Rest-SS	7.10	4.64	1.00	1.0	1.26	7.10																				
2194	Southside Port Washington Narrows 18th Street	Rest-SS	6.76	4.74	1.00	1.0	1.18	6.76																				
2195	Evergreen Park	Rest-ST-XS	23.13						1.66	3.00	0.0	4.21	20.94	1.00	1.00	0.0	2.19	2.19										
2196	Washington Avenue	Rest-SS	22.67	4.40	3.00	1.5	1.54	22.67																				
2197	Puget Sound Naval Shipyard	Rest-TF-XS	9.00											1.00	1.00	0.0	6.00	6.00	3.00	1.00	0.0	1.00	3.00					
2198	Wright Creek on north side of Sinclair Inlet	Rest-FP-TF	56.00																3.00	2.00	0.0	1.00	6.00	4.00	2.00	2.0	5.00	50.00
2199	Gorst	Rest-TF-XS	17.00											1.00	1.00	1.0	6.00	12.00	4.00	1.00	1.0	1.00	5.00					
2200	Anderson Creek	Rest-FP	12.00																				6.00	2.00	0.0	1.00	12.00	
2203	Ross Creek	Rest-FP-TF	47.32																4.00	1.00	3.0	1.76	12.32	4.00	1.00	3.0	5.00	35.00
2206	Port Orchard Blvd	Rest-FP	6.00																				1.00	2.00	0.0	3.00	6.00	
2207	South of Water St	Rest-XS	3.08											1.00	1.00	1.0	1.54	3.08										
2208	North of Water St	Rest-XS	3.03											1.00	1.00	1.0	1.52	3.03										
2209	East Bay Street	Rest-ST	12.02						3.48	1.00	2.5	2.01	12.02															
2210	Annapolis Beach Park	Rest-XS	12.54											1.00	1.00	3.5	2.79	12.54										
2211	Annapolis Olney Creek Arnold Ave	Rest-FP	8.00																				4.00	2.00	0.0	1.00	8.00	
2212	Annapolis Beach Park	Rest-FP	60.00																				6.00	2.00	0.0	5.00	60.00	
2213	South Beach Drive	Rest-TF	3.00																3.00	1.00	0.0	1.00	3.00					
2214	Beach Dr at Sacco	Rest-ST-FP-TF	68.51						2.87	1.50	1.0	2.12	11.27						4.00	3.00	0.0	2.27	27.24	4.00	1.00	2.0	5.00	30.00
2215	Beach Dr South	Rest-FP-TF	15.00																3.00	2.00	1.0	1.00	7.00	4.00	2.00	2.0	1.00	8.00
2217	Beach Dr	Rest-FP	50.00																				4.00	2.50	0.0	5.00	50.00	
2218	Beach Dr Waterman	Rest-TF	12.40																4.00	1.00	1.0	2.48	12.40					
2219	North of Waterman Point	Rest-ST	1.06						1.00	1.00	0.0	1.06	1.06															
2220	North of Waterman Point	Rest-FP	6.00																				1.00	2.00	0.0	3.00	6.00	
2222	Manchester State Park	Rest-XS	4.50											1.00	3.00	1.5	1.00	4.50										
2223	Beaver Creek	Rest-ST-FP-TF	103.04						2.59	2.50	1.5	2.01	16.04						3.00	2.50	1.0	6.00	51.00	4.00	2.50	2.0	3.00	36.00
2224	Little Clam Bay	Rest-FP-TF	111.00																4.00	2.50	2.0	6.00	72.00	4.00	2.50	3.0	3.00	39.00
2225	US Navy at Orchard Point	Rest-ST-XS	16.32						1.12	2.50	2.0	1.90	9.14	1.00	2.50	2.0	1.60	7.18										
2226	Manchester	Rest-ST	10.90						1.76	2.50	2.5	1.58	10.90															
2227	Manchester	Rest-ST	9.37						1.84	2.50	2.5	1.32	9.37															
2228	Duncan Creek	Rest-FP	45.00																				6.00	2.50	0.0	3.00	45.00	
2229	Colchester at Prichard Rd E	Rest-ST	4.77						2.34	1.00	1.5	1.24	4.77															
2230	Colchester at E Perelli Ln	Rest-ST	3.46						2.10	1.00	0.5	1.33	3.46															
2231	Colchester at E Pheasant Hill Ln	Rest-ST	5.08						2.07	1.00	0.5	1.98	5.08															
2232	Colchester at SE Ofarrell Ln	Rest-ST	4.80						1.91	1.00	1.5	1.41	4.80															
2233	Colchester at SE Cammer Rd	Rest-ST	4.70						1.83	1.00	1.5	1.41	4.70															
2234	North of Curley Creek	Rest-ST-TF	14.00						1.00	1.50	1.0	2.00	5.00						3.00	3.00	0.0	1.00	9.00					
2235	North of Curley Creek	Rest-ST	2.94						1.12	1.50	0.0	1.75	2.94															
2236	Yukon Harbor	Rest-SS	10.40	2.37	1.00	2.5	2.14	10.40																				
2237	South Colby	Rest-SS-ST	16.65	3.06	1.00	2.5	1.38	8.99	1.65	1.00	2.5	2.17	7.66															
2238	Wilson Creek	Rest-TF	4.00																3.00	1.00	1.0	1.00	4.00					
2239	North of Harper	Rest-ST	60.16						3.41	2.50	1.5	6.00	60.16															
2240	Harper Estuary	Rest-ST-FP-TF	121.34						2.50	2.00	3.0	2.04	16.34						4.00	3.00								

Project ID	Site Name	Opportunity	Overall Project Score	Restore SS					Restore ST					Restore XS					Restore TF					Restore FP				
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2245	North of Southworth Ferry Dock	Rest-ST	6.94						1.32	1.00	3.0	1.61	6.94															
2246	South of Driftwood Cove View Park	Rest-SS	26.93	2.73	4.50	2.0	1.88	26.93																				
2247	South of Driftwood Cove Jodyann Ct	Rest-ST	24.85						1.40	4.50	3.0	2.67	24.85															
2248	South of Driftwood Cove Goat Trail Rd	Rest-ST	20.62						1.44	4.50	3.0	2.17	20.62															
2249	Fragaria	Rest-SS	32.46	3.22	4.50	3.0	1.85	32.46																				
2250	Command Point	Rest-ST	13.82						1.74	4.50	2.0	1.41	13.82															
2251	South of Command Point	Rest-SS	27.85	3.52	4.50	3.0	1.48	27.85																				
2252	Prospect Point	Rest-ST	15.67						2.06	4.50	2.5	1.33	15.67															
2254	Olalla at Crescent Valley Rd SE	Rest-ST-TF	97.31						3.22	4.50	2.5	1.14	19.31					4.00	3.00	1.0	6.00	78.00						
2255	North of Sunny Cove	Rest-SS	39.22	5.61	4.50	3.5	1.36	39.22																				
2256	Sunny Cove Dr (south of Olalla)	Rest-FP-TF	87.21															4.00	2.50	1.0	1.11	12.21	6.00	2.50	0.0	5.00	75.00	
2263	North of Sunrise Beach	Rest-ST-TF	18.67						1.70	1.50	3.0	1.99	11.06					3.00	1.50	2.0	1.17	7.61						
2266	Agate Point	Rest-SS	23.70	2.86	4.50	3.5	1.45	23.70																				
2267	Agate Point	Rest-SS	54.22	4.05	4.50	5.0	2.34	54.22																				
2268	Arbor Fund	Rest-SS	37.97	4.76	3.00	6.5	1.83	37.97																				
2269	Port Madison	Rest-SS	25.07	4.29	3.00	3.5	1.53	25.07																				
2270	Port Madison at Gordon Dr NE	Rest-ST-TF	14.76						2.48	1.00	2.5	1.33	6.61					3.00	1.00	2.0	1.63	8.15						
2271	Port Madison at Broom St	Rest-ST	16.32						2.42	1.00	2.5	3.31	16.32															
2272	West Port Madison	Rest-XS	6.46											1.00	3.00	1.0	1.61	6.46										
2273	East Port Madison	Rest-XS	7.71											1.00	4.50	1.0	1.40	7.71										
2274	Northeast Port Madison at Washington Ave NE South	Rest-ST	14.25						3.17	2.50	2.0	1.43	14.25															
2275	Northeast Port Madison at Washington Ave NE Central	Rest-ST	11.45						3.24	2.50	2.0	1.13	11.45															
2276	Northeast Port Madison at Washington Ave NE North	Rest-ST	13.30						3.32	2.50	2.0	1.29	13.30															
2277	Northeast Port Madison at Euclid Ave	Rest-SS	40.57	5.96	4.50	2.5	1.38	40.57																				
2278	Lafayette Ave	Rest-FP	10.50																				1.00	3.50	0.0	3.00	10.50	
2279	North of Port Madison Creek at NE Puget Bluff Ln	Rest-SS	24.12	4.08	4.50	2.0	1.18	24.12																				
2280	North of Port Madison Creek at Sunrise Bluff Ln	Rest-SS	35.87	4.18	4.50	3.0	1.64	35.87																				
2281	North of Port Madison Creek at Manor Ln	Rest-SS	54.72	4.29	4.50	3.0	2.45	54.72																				
2282	Port Madison Creek	Rest-SS	21.46	4.49	3.00	2.0	1.39	21.46																				
2284	Sunrise Drive NE	Rest-FP	7.50																			1.00	2.50	0.0	3.00	7.50		
2285	Rolling Bay Walk	Rest-ST	55.58						3.37	4.50	2.5	3.15	55.58															
2286	Skiff Point	Rest-SS	43.82	5.77	4.50	2.5	1.54	43.82																				
2287	Manitou Beach	Rest-SS	37.10	5.88	3.00	2.5	1.84	37.10																				
2288	South Manitou Beach	Rest-TF	39.00															3.00	1.50	2.0	6.00	39.00						
2289	Murden Creek at State Hwy 305 NE	Rest-FP	42.00																			4.00	3.50	0.0	3.00	42.00		
2290	Murden Cove at Green Spot PI NE	Rest-ST	10.08						2.05	3.50	0.0	1.40	10.08															
2291	NE Lofgren Road	Rest-FP	4.00																			1.00	3.00	1.0	1.00	4.00		
2292	Wing Point	Rest-ST	8.82						3.44	1.00	2.0	1.62	8.82															
2294	West of Hawley Creek	Rest-ST	12.80						2.91	3.00	2.0	1.19	12.80															
2295	North of COBI Ferry Dock	Rest-SS	24.97	4.50	3.00	3.0	1.51	24.97																				
2297	Winslow Ave	Rest-FP	13.50																			1.00	2.50	2.0	3.00	13.50		
2300	North Eagle Harbor Community Center	Rest-ST	12.28						2.36	1.50	1.5	2.43	12.28															
2301	North Eagle Harbor	Rest-XS	3.11											1.00	1.50	1.0	1.24	3.11										
2302	Sportsmans Club Creek	Rest-FP	10.50																			1.00	2.50	1.0	3.00	10.50		
2304	Cooper Creek (head of Eagle Harbor)	Rest-FP	60.00																			4.00	2.50	2.0	5.00	60.00		
2305	Upper Eagle Harbor	Rest-XS-FP	15.22											1.00	2.50	0.0	1.09	2.72				1.00	2.50	0.0	5.00	12.50		
2306	Cougar Creek	Rest-FP	7.50																			1.00	2.50	0.0	3.00	7.50		
2307	South Eagle Harbor at Harbor PI	Rest-XS	3.61											1.00	1.50	1.5	1.20	3.61										
2308	Eagle Harbor Drive	Rest-FP	7.50																			1.00	2.50	0.0	3.00	7.50		
2309	South Eagle Harbor at Rose Lp	Rest-FP	7.50																			1.00	2.50	0.0	3.00	7.50		
2311	Whiskey Creek	Rest-FP	12.50																			1.00	2.50	0.0	5.00	12.50		
2312	Pritchard Park	Rest-XS	8.75											1.00	1.50	4.0	1.59	8.75										
2314	Ravine Creek	Rest-FP	2.50																			1.00	2.50	0.0	1.00	2.50		
2315	Ravine Creek	Rest-FP	30.00																			4.00	2.50	0.0	3.00	30.00		
2316	Blakely Harbor	Rest-ST	9.30						2.46	3.00	0.0	1.26	9.30															
2317	Mac's Dam Creek	Rest-FP	36.00																			4.00	3.00	0.0	3.00	36.00		
2318	Blakely Harbor	Rest-FP-TF	26.00															4.00	3.00	1.0	1.00	13.00	4.00	3.00	1.0	1.00	13.00	
2319	NE Country Club Rd	Rest-FP	10.00																			4.00	2.50	0.0	1.00	10.00		
2320	NE Country Club Rd	Rest-FP	2.00																			1.00	2.00	0.0	1.00	2.00		
2321	Country Club Rd and Area	Rest-ST	29.23						3.16	3.00	2.0	2.54	29.23															
2322	Restoration Point	Rest-XS	10.24											1.00	3.00	1.0	2.56	10.24										
2323	Restoration Pt	Rest-XS	5.24											1.00	1.00	2.5	1.50	5.24										
2324	South Beach Beans Bight Rd East	Rest-ST	9.04						2.49	1.00	2.5	1.81	9.04															
2325	South Beach Beans Bight Rd West	Rest-XS	6.66											1.00	1.00	2.5	1.90	6.66										
2326	South Beach East	Rest-ST	9.42						2.29	1.00	2.5	1.96	9.42															
2327	South Beach East	Rest-ST	6.46						2.24	1.00	2.5	1.36	6.46															
2328	Toe Jam Hill Rd	Rest-FP	6.00																			1.00	2.00	0.0	3.00	6.00		
2329	South Beach Chester Street	Rest-FP	10.00																			1.00	2.00	0.0	5.00	10.00		
2330	South Beach	Rest-SS	17.95	4.10	3.00	1.5	1.30	17.95																				
2331	South Beach	Rest-ST	10.85						1.83	1.00	2.5	2.51	10.85															
2332	Fort Ward State Park	Rest-FP	3.00																			1.00	2.00	1.0	1.00	3.00		
2333	Pleasant Beach	Rest-ST	3.54						1.45	1.00	1.5	1.20	3.54															
2334	Pleasant Beach	Rest-ST	4.12						1.44	1.00	1.5	1.40	4.12															
2335	Point White Dr	Rest-TF	27.36																									

Project ID	Site Name	Opportunity	Overall Project Score	Restore SS					Restore ST					Restore XS					Restore TF					Restore FP				
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2339	Westwood	Rest-SS-ST	38.24	5.01	3.00	2.0	1.60	27.23	3.00	3.00	2.0	1.00	11.01															
2340	Westwood	Rest-SS-ST	35.04	4.96	3.00	2.0	1.43	24.09	2.98	3.00	2.0	1.00	10.95															
2341	North Gazzam Preserve Shoreline North	Rest-SS	8.34	4.41	1.00	2.0	1.30	8.34																				
2342	North Gazzam Preserve Shoreline North	Rest-ST	16.48						2.69	3.00	3.0	1.49	16.48															
2343	West Bainbridge Hansen Rd NE	Rest-SS-ST	20.73	4.25	1.50	4.0	1.09	11.34	2.63	1.50	4.0	1.18	9.39															
2344	Foster Rd	Rest-FP	10.50																			1.00	3.50	0.0	3.00	10.50		
2346	Issei Creek (Fletcher Bay)	Rest-FP	14.00																			4.00	3.50	0.0	1.00	14.00		
2348	North Fletcher Bay Creek	Rest-FP	42.00																			4.00	3.50	0.0	3.00	42.00		
2349	WF Issei Creek (Fletcher Bay)	Rest-FP	14.00																			4.00	3.50	0.0	1.00	14.00		
2350	Olympus Beach Rd NE	Rest-SS	12.32	3.55	1.00	3.0	1.88	12.32																				
2351	South of Battle Point and Tolo Rd	Rest-ST	5.65						2.22	1.00	2.0	1.34	5.65															
2352	North of Battle Point	Rest-ST	7.59						2.50	1.00	2.0	1.69	7.59															
2353	Miemois Creek	Rest-XS	1.18											1.00	1.00	0.0	1.18	1.18										
2354	Miemois Creek in Manzanita Bay	Rest-FP	6.00																			1.00	2.00	0.0	3.00	6.00		
2356	Peterson Hill Rd NE	Rest-FP	12.00																			4.00	3.00	0.0	1.00	12.00		
2358	Manzanita Bay at NE Bergman Rd	Rest-SS	9.71	3.61	1.50	1.0	1.51	9.71																				
2359	Manzanita	Rest-ST	10.99						2.77	1.50	2.0	1.79	10.99															
2361	Manzanita	Rest-SS	41.76	5.95	3.00	3.5	1.96	41.76																				
2362	North of Manzanita at Silven Ave NE	Rest-SS	37.98	4.55	3.00	5.5	1.98	37.98																				
2363	North of Manzanita on Henderson Rd NE	Rest-SS	39.15	4.05	3.00	5.5	2.22	39.15																				
2364	North of Manzanita on Henderson Rd NE	Rest-SS	31.05	3.85	3.00	5.5	1.82	31.05																				
2365	West Bainbridge Henderson Rd NE	Rest-SS	18.69	3.67	3.00	5.5	1.13	18.69																				
2366	West Bainbridge South of Bridge	Rest-SS	21.62	2.98	3.00	4.5	1.61	21.62																				
2367	West of Agate Point	Rest-SS	11.89	2.29	1.00	6.5	1.35	11.89																				
2370	North of Jefferson Point	Rest-ST	12.36						2.46	2.50	1.5	1.62	12.36															
2372	Kitsap Creek at Kingston St	Rest-FP	36.00																			4.00	3.00	0.0	3.00	36.00		
2373	west side of Miller Bay	Rest-FP	17.50																			1.00	3.50	0.0	5.00	17.50		
2374	Northeast Miller Bay	Rest-FP	4.50																			1.00	3.50	1.0	1.00	4.50		
2375	Northwest Miller Bay	Rest-FP	13.50																			1.00	3.50	1.0	3.00	13.50		
2378	Southside Port Washington Narrows High Ave	Rest-SS	5.89	3.92	1.00	0.5	1.33	5.89																				
2379	Puget Sound Naval Shipyard	Rest-XS	4.21											1.00	1.00	0.0	4.21	4.21										
2380	SR 304 Ramp	Rest-FP	6.00																			1.00	2.00	0.0	3.00	6.00		
2381	East of Anderson Creek	Rest-XS	1.43											1.00	1.00	0.0	1.43	1.43										
2383	Blake Island State Park	Rest-ST	54.58						1.65	3.50	4.0	5.59	54.58															
2384	South of Point Richmond	Rest-TF	12.00															4.00	3.00	0.0	1.00	12.00						
2385	Skunk Bay at NE Admiralty Wy	Rest-FP	10.50																			1.00	3.50	0.0	3.00	10.50		
2386	West Dyes Inlet Chico Beach Dr	Rest-FP	2.50																			1.00	2.50	0.0	1.00	2.50		
2387	Beach Dr	Rest-FP	6.00																			1.00	2.00	0.0	3.00	6.00		
2388	West Kingston Rd	Rest-TF	4.00															4.00	1.00	0.0	1.00	4.00						
2390	Annapolis Olney Creek and Karcher Creek at Beach Dr	Rest-TF	22.50															4.00	2.00	1.0	2.50	22.50						

