

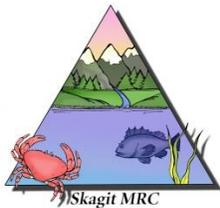
# Marine Shoreline Protection Assessment for Skagit County



Shoreline property on Samish Island with Skagit Land Trust Conservation Easement. SLT files.

Prepared for and with funding from: Skagit County Marine Resources Committee

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## Table of Contents

Tables, Figures and Maps.....	3
Introduction and Background.....	4
Methods.....	5
Results.....	8
Discussion.....	24
Tidelands Analysis.....	25
Data limitations.....	31
References.....	32
Appendix A: Protection Assessment Data Index.....	33
Appendix B: Priority Reach Metrics.....	38

## Tables

Table 1: Samish Bay Management Unit Priority Reaches.....	13
Table 2: Padilla Bay Management Unit Priority Reaches.....	15
Table 3: Swinomish Management Unit Priority Reaches.....	17
Table 4: Islands Management Unit Priority Reaches.....	19
Table 5: Skagit Delta Management Unit Priority Reaches.....	23

## Figures

Figure 1: Example map of the marine reaches used in assessment.....	6
Figure 2: Map of marine management units.....	9
Figure 3: Samish basin agricultural lands.....	14
Figure 4: Joe Leary Slough.....	15
Figure 5: Similk Bay residential development.....	20
Figure 6: Sinclair Island coastline.....	21
Figure 7: Cypress Island shoreline conservation easement.....	21
Figure 8: Guemes Island feeder bluff.....	22
Figure 9: Skagit River Delta.....	23
Figure 10: Tideland parcels linkage with shoreline parcels.....	27
Figure 11: Fidalgo Bay tidelands.....	30

## Maps

Maps 1 & 2: High Conservation Value Shoreline Reaches in Skagit Co.....	9, 10
Map 3: Priority Protection Marine Reaches.....	11
Map 4: Marine Management Units.....	12
Map 4: Tidelands Public and Private Ownership.....	26
Map 5: Samish Bay Tideland Ownership.....	29

# Marine Shoreline Protection Assessment for Skagit County

Skagit Land Trust (SLT) conducted a spatial analysis of Skagit County marine shorelines to identify marine shoreline reaches with both high conservation value and land protection potential. Identified reaches are important for maintaining or improving marine shoreline ecosystem processes and / or wildlife habitat. Important shoreline values include eroding bluffs or sediment source beaches, eelgrass beds, spawning beaches for forage fish, and shorelines that support estuaries.

## Introduction and Background

The majority of Skagit County's 228 miles of marine and estuarine shorelines are in private ownership. Protecting shoreline is critical to maintaining marine and estuarine ecosystem processes. Land conservation helps retain natural shoreline processes, such as erosion, deposition, and flooding by limiting shoreline modifications; and it contributes to the protection of habitat conditions, species, and vegetation communities. Permanent protection of land containing intact shoreline, before damage has occurred, is often more cost-effective than repairing and restoring degraded habitat. Moreover, restoration is often not feasible once land is developed.

Skagit Land Trust's two main conservation targets for the protection of marine shorelines in Skagit County are shorelines critical for ecosystem processes, and important nearshore habitats and species. Each of these conservation targets has measurable criteria that define it. For example, one criterion that defines ecosystem processes is a feeder bluff, which supplies sediment to nearby beaches. An example criterion that defines important nearshore habitats and species is the presence of forage fish spawning sites.

Skagit Land Trust (SLT) focuses on permanently protecting lands with exceptional conservation value throughout Skagit County. SLT works mostly with private landowners, and focuses first on protection of intact functioning habitat. SLT protects land through purchase or donation of property interests. Such property interests may be through either "in-fee," which is outright ownership of the land, or through a conservation easement (CE), which creates permanent restrictions on how the land can be used. SLT also partners with government agencies to help facilitate conservation transactions. SLT is a private community-based nonprofit organization, and a nationally accredited land trust. SLT has no regulatory or condemnation authority, and works only with interested and willing landowners on voluntary transactions.

This assessment is a step toward identifying and prioritizing marine shoreline parcels in private ownership. SLT intends to use this assessment to help guide proactive outreach to landowners in the areas that are most important -- those areas with the most conservation value combined with the best opportunities for conservation. SLT will also seek out partnership opportunities whenever possible to leverage the best possible outcomes for permanent voluntary conservation of priority coastal lands.

## **Data Sources Used to Identify Conservation Values / Criteria**

This assessment was done using available analyses and data from state agencies and other organizations. Integrating many data sources and assessments provided a robust, current platform on which to identify shoreline reaches. There are several high quality and current datasets available that characterize marine shorelines. Puget Sound wide assessments were integrated with finer resolution biological, physical and legal data. This assessment brought available data into a useable and appropriate context for land protection in order to identify and prioritize short shoreline reaches for protection.

Data sources used identify shoreline conservation values are described in *Appendix A* and include the following:

- Washington Department of Fish and Wildlife (WDFW) Marine Shoreline Habitats Assessment, which is part of A Coarse-scale Assessment of the Relative Value of Small Drainage Basins and Marine Shorelines for the Conservation of Fish and Wildlife Habitats in Puget Sound Basin. Referred to in document as “WDFW Habitat”.
- Washington Department of Ecology (DOE) Coastal Landforms and Feeder Bluff data, completed by Coastal Geologic Services.
- Department of Natural Resources (DNR) Puget Sound Eelgrass Monitoring Dataset (SVMP) North Puget Sound Transect Data
- Skagit County Shoreline Master Program Draft Shoreline Reach Scale Functions and Processes analysis, completed by The Watershed Company. The analysis includes hydrologic, habitat and vegetation components. Referred to in document as "SMP Hydro / Vegetation / Habitat Analysis".
- DFW Priority Habitats and Species (PHS) data for forage fish, including herring, sand lance and surf smelt.
- Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) strategies for barrier embayments, beaches, coastal inlets, and deltas.<sup>1</sup>

## **Methods**

Skagit County marine shorelines were evaluated using shoreline reaches as the geographic unit within which protection criteria were quantified. Reaches used in this assessment were based on the shoreline reaches used in Skagit County’s Shoreline Master Program Shoreline Assessment (Figure 1). A

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<sup>1</sup> The Puget Sound Nearshore Ecosystem Restoration Project developed strategies for nearshore protection in Puget Sound. It identified four different landscape systems – river deltas, barrier embayments, beaches, and inlets – and developed a strategy for each of them. Many physical metrics were incorporated into the landscape strategies (Cereghino et al. 2012). Strategies are based on “potential,” the historical quantity and diversity of ecosystem services; on “degradation,” the loss of historic ecosystem services, and on potential “risk”. Within each landscape system, higher potential sites are assigned recommendations of “Protect”, “Restore”, or “Enhance”.

400' buffer was created for the reaches in order to more easily capture conservation values within the nearshore. Shoreline reach unit mean length was 2.5 kilometers.



**Figure 1:** Example Map of Marine Units (MU's) used in the protection assessment. MU's are based on shoreline reaches used in Skagit County's Shoreline Master Program Shoreline Analysis, with reach breaks determined by changes in land use, armoring, shoreform, drift cell breaks, changes in vegetation and wetland areas. For the purpose of display, units are outlined in yellow and overlap each other at shoreline edges. The marine shoreline is highlighted in white. Green polygons depict land owner protection classes.

The total number of SMP marine shoreline reaches in the analysis was 114. The total number within Skagit County is 137, but 23 were excluded. Shoreline reaches that were excluded from the analysis include those that are already protected; for example, Kiket, Skagit, and Hope Islands, Hat, Saddlebag and Huckleberry Islands, and Deception Pass State Park. Also excluded were shoreline reaches that are heavily developed or industrialized, for example, Lovric's, Cap Sante and Skyline Marinas, and Shelter Bay. The reason to exclude both protected and heavily developed reaches was that there was no opportunity for protection.

The Marine Shoreline Protection Assessment was done in two steps. The first step was a "Conservation Values Analysis", to determine which reaches had the most conservation value, defined as those having the highest measure of conservation target criteria. Within those reaches that ranked high in the Conservation Values Analysis, a second step was to look at whether or not protection was feasible, and to what degree. The tidelands analysis was done separately, with a focus on protection feasibility.

### Conservation Values Analysis (CVA)

The Conservation Values Analysis was done by first building a criteria index for all 114 reaches. The index is based on the data sources listed in Appendix A, but recorded and quantified by individual reach and spatially linked within GIS. Shorelines critical for ecosystem processes, referred to as

“Process,” and important nearshore habitats and species, referred to as “Habitat,” are evaluated using multiple criteria.

Each conservation target was evaluated and ranked separately instead of in combination. Coastal shoreline types are extremely variable and looking at the two conservation targets individually provides a better picture of their contributions to the marine nearshore ecosystem.

Both the PSNERP Strategies for Nearshore Protection and the WDFW Habitat Study were done based on watersheds, not on counties. Skagit County resides within the Whidbey Basin, and within the San Juan Islands Basin. In these studies, shorelines were ranked relative to other shorelines within the same basin. In an effort to avoid errors by comparing reaches between the basins, the Conservation Values Analysis was done by basin, but it was limited to only Skagit County. The Whidbey basin has 36 reaches and the San Juan Basin 78.

Each conservation target ranking, both Process and Habitat, was classified based on 4 quantiles, or groups. Those reaches that rank in the highest 25% are in the top tier for that target. Those that rank in between 50 and 75% are in the second tier. In order for a reach to be considered highly ranked in the CVA, it needed to rank in the top tier for either one or both of the targets, or be in the second tier for both targets.

In addition to the Process and Habitat criteria, local analyses were reviewed in order to add information about reaches when available. This information was not used as a numeric value, but as added qualitative information. Studies included:

- Guemes Rapid Shoreline Inventory (Clark et al. 2005)
- Skagit Bays Blueprint (Bloch et al. 2006)
- Coastal geomorphic assessment and restoration prioritization studies, completed by Coastal Geologic Survey (Johannessen & MacLennan 2007; MacLennan & Johannessen 2008; MacLennan et al. 2010)
- Padilla Bay National Estuarine Research Reserve’s Management Plan (Padilla Bay NERR 2008)
- opportunities referenced in the Skagit County Shoreline Master Program Update (The Watershed Company 2011)

Using local studies was valuable to identify if important reaches were missed in the CVA and potential opportunities that may not otherwise be apparent.

There are caveats to using GIS data. Datasets can be incomplete or inaccurate. Others are available only on a regional scale and are not useful at the parcel or project scale. Some of the datasets were regional and others more local. For these reasons, Skagit Land Trust will always make the assumption that presence or absence of a mapped feature does not necessarily mean actual presence or absence on the site. Project selection and evaluation will always include a site specific evaluation.

#### Protection Feasibility Assessment (PFA)

Shoreline parcels were identified using two different approaches. One used 2014 parcel data. This identifies individual parcels. A shoreline parcel layer was created in GIS based on an intersect with the marine shoreline. Water parcels were excluded from the parcel analysis as they are the focus of the

Tidelands Assessment. This layer was then linked to the Assessor's data in order to provide information about parcel size, ownership, land use, etcetera.

The second approach used the draft "Rural Buildout" dataset from Skagit County GIS. This dataset is from 2010; while somewhat older than the most current Assessor's data, it has some distinct advantages because parcels that are contiguous, and have the same ownership were joined into a single polygon. The dataset also includes theoretical residential development potential; this potential was tallied to represent the level of threat of development within each reach. This dataset excludes Cities, Urban Growth Areas, Public Open Space of Regional/Statewide Importance (OSRSI), and water parcels.

Parcel metrics, including total number of parcels and average size, were tallied using the parcel data, as were aggregated parcel metrics using the Rural Buildout data. The availability of larger parcels and undeveloped areas was noted. Large parcels can be misleading because size doesn't accurately portray shoreline length. Much of a parcel may be inland with a short area of shoreline. Another problem is created by parcels with borders that fall within two different reaches, as it can be double counted. Large area double-counted parcels were easily identified and corrected. There may be a few small parcels that were not identified, but with little effect of the overall outcomes.

Zoning was determined based on the dominant zoning category within a reach, noting more than one category if several zoning types were common. In addition, predominant land use(s) and land ownership patterns were evaluated and recorded. This included the presence of protected lands, both conservation and working, and the manager of those lands.

### Priority Reaches

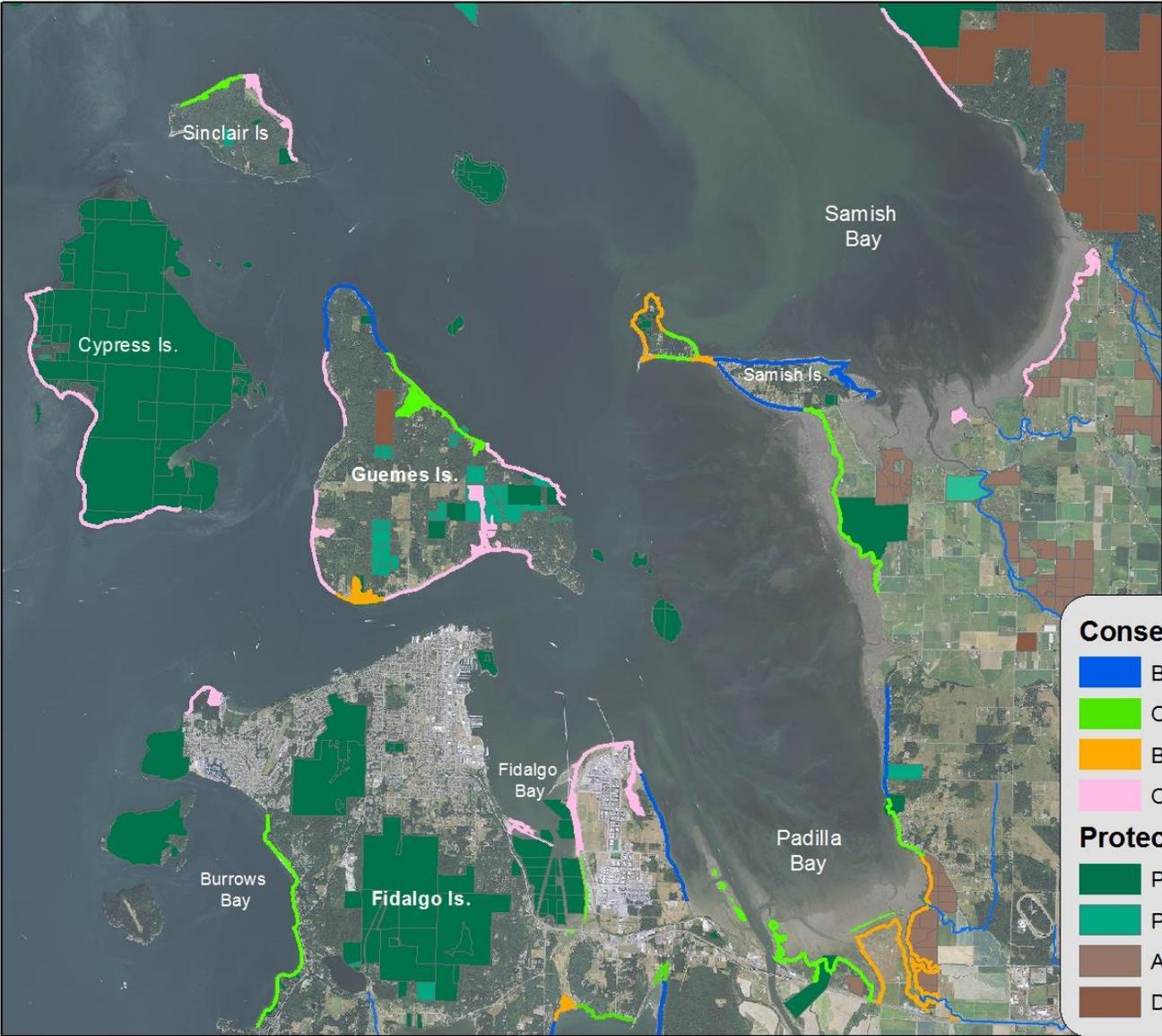
Reaches that ranked high in the Conservation Values Assessment and have some protection feasibility were designated as priorities. Priority Reaches are shorelines where ecological values overlap with one another to create focus areas for conservation. They are focused specifically on the Trust's conservation targets and guide protection efforts of high priority critical resources. In addition, these areas are places where conservation is feasible and where the Trust has opportunities to meet conservation targets. Identifying priority shoreline reaches encourages acquisition work at a scale necessary for sustaining or restoring natural processes.

### Results

The Conservation Values Assessment (CVA) identified just under half of the shoreline reaches as important. Out of 114 reaches total, 53 ranked high in the CVA (Maps 1 & 2: High Conservation Value Shoreline Reaches). Twelve ranked in the top tier for both conservation targets. Sixteen ranked in the top tier for one target and in the second tier for the other. Eight ranked in the second tier for both targets, and 17 ranked in the top tier for one target and in the bottom two tiers for the other.

Out of the 53 reaches that ranked high in the CVA, 27 were identified as priorities in the Protection Feasibility Analysis (PFA) (Map 3: Priority Protection Marine Reaches). Eleven were categorized as a high priority for protection, eleven were categorized as a priority with limited opportunity, and five are a priority as supporting role in a partnership. In addition, there are three reaches of interest that have protection potential, but did not rank high in the CVA.

# High Conservation Value Shoreline Reaches in N Skagit Co.



Map 1



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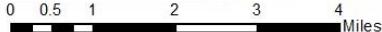
Care was used during the compilation of this map to ensure accuracy. However, due to changes in ownership and the need to rely on outside information, Skagit Land Trust cannot accept responsibility for errors or omissions, and therefore, there are no warranties which accompany this material. This map was created from available public records and existing map sources, not from field surveys.

**Conservation Values**

- Both 1st Tier
- One 1st, One 2nd Tier
- Both 2nd Tier
- One 1st Tier

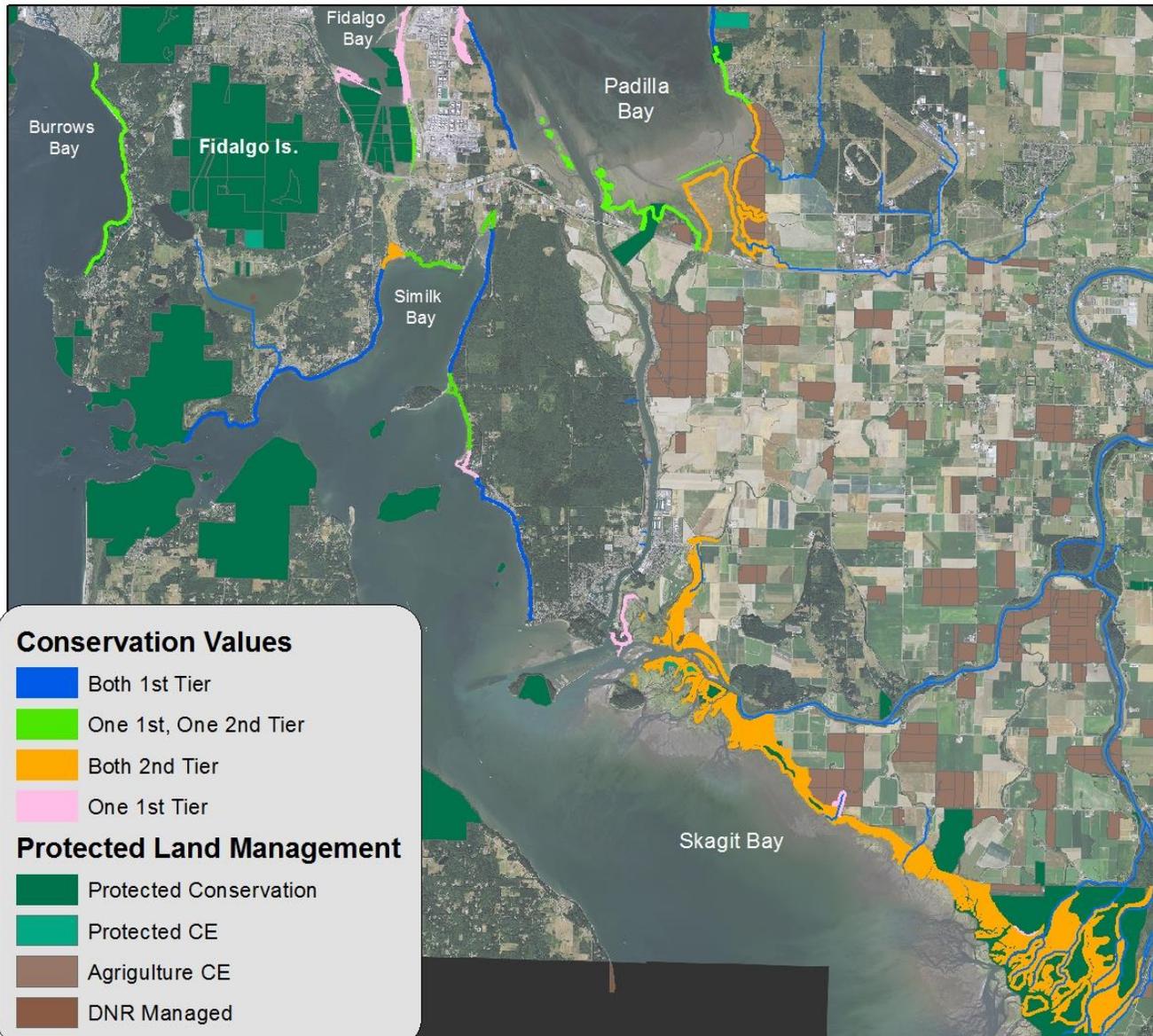
**Protected Land Management**

- Protected Conservation
- Protected CE
- Agrigulture CE
- DNR Managed



# High Conservation Value Shoreline Reaches in S Skagit Co.

Map 2



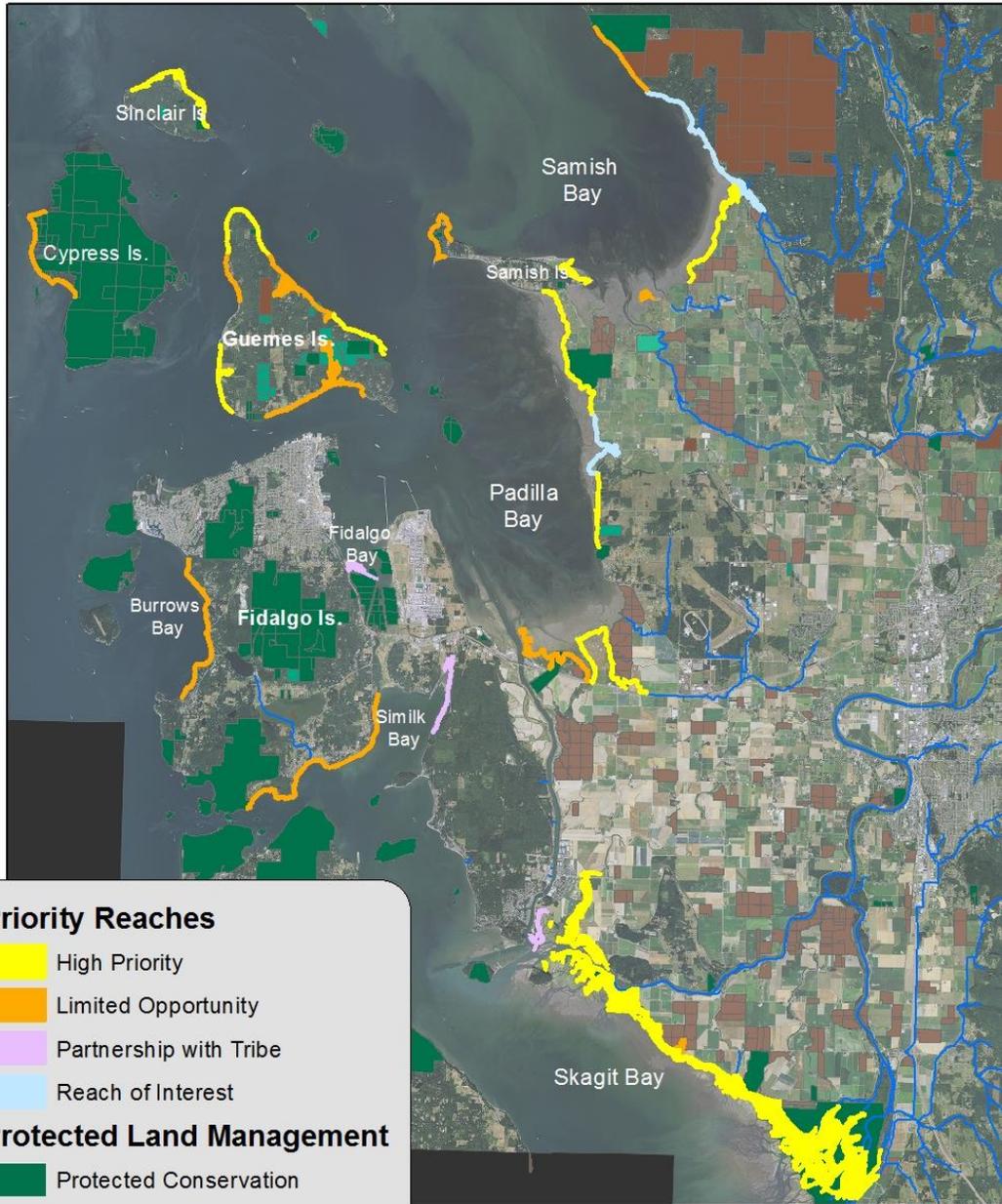
N 1:125,000



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0 0.5 1 2 3 4 Miles

# Priority Protection Marine Reaches in Skagit Co.



0 1 2 4 6 8 Miles

1:200,000

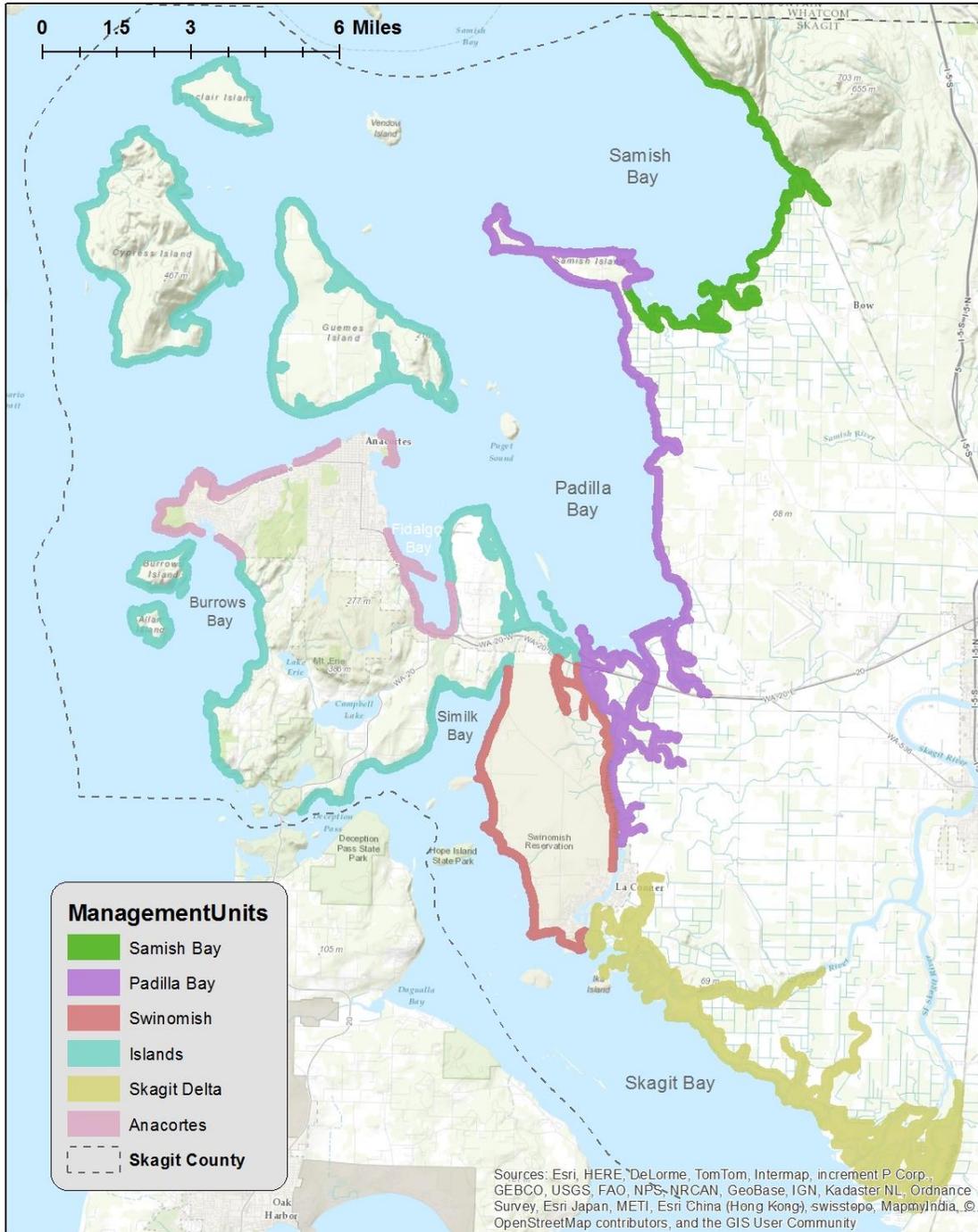


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Map 3

Detailed results and priority reaches are described within SMP Management Units. The units provide a geographic context for thinking about priorities. Results are organized within six management units: Samish Bay, Padilla Bay, Swinomish, Islands, Skagit Delta, and Anacortes (Map 4). These same units are used to organize the results of the tidelands analysis.



Map 4: Map of Marine Management Units used in the Skagit County SMP Reach Analysis. Results of this assessment are organized and described within these geographic units.

## Samish Bay Unit

Three out of eight reaches in Samish Bay ranked high for conservation values, all in the top tier (high) for habitat. Two additional reaches ranked in the second tier (medium high) for habitat. None of the reaches ranked in the two top tiers for shoreline processes.

### Shoreline with Conservation Values and Protection Potential

Of the three reaches analyzed for the feasibility assessment, one is a high priority and two were priority, but with limited opportunity. There are two additional reaches of interest that did not rank high for conservation values. Residential development potential is low due to the agriculture zoning designation. *See Appendix C for more detail.*

Reach #	Name	# of Agg. Parcels	Avg. Size (Ac)	Notable	Zoning	Process Rank	Habitat Rank	Local Analysis / Plan	PRIORITY
1	N Samish Bay / Larrabee	7	3.2	Much of reach is Larabee State Park. 2 of 7 parcels are PSE. Really only 3 landowners - 2 with undeveloped land. Very narrow shoreline bordered by RR.	SF-NRL	Low	High	yes	limited opportunity
4	South of Colony	8	58.9	Several very large lots.	Ag-NRL	Low	High	no	yes
6	marshy island	2	73.7	Tiny reach. Marshy wetland with interior pond. Appears diked. Single corporation landowner.	Ag-NRL	Low	High	no	limited opportunity

Table 1: Priority Protection Reaches for the Samish Management Unit. The “# of Agg. Parcels” data is for shoreline properties and comes from the Rural Buildout dataset. “Avg. Size (Ac)” is the mean of the aggregated parcels. “Local Analysis / Plan” references the designation of a site(s) within the reach as a priority for conservation, or if noted, for restoration.

While the Northern Samish Bay reach (no. 2) and the Colony Creek reach (no. 3) did not rank highly enough to be included in the protection assessment, they are of interest for several reasons. Both rank medium high for habitat in the Protection Assessment. Colony Creek ranks highly in the Shoreline Master Program Reach Analysis relative to the other reaches within Samish Bay, especially for hydrologic functioning and vegetation. The Skagit Bays Blueprint identifies both reaches as important for conservation, along with the N Samish Bay / Larrabee reach.

### Conservation Values

Samish Bay is most notable for marine habitat, especially in the central to northern part of the bay. Eelgrass is present in the entire bay. WDFW Habitat notes the upper and central part of the bay are especially important habitat for Dungeness crab, Audubon’s bird polygons, National Wetlands Inventory (NWI) wetlands, eelgrass, Chum, Coho, Coast Resident Cutthroat, large regular concentrations of shorebirds and of waterfowl, intertidal hardshell clams, and herring. The Samish River outlet and Edison Slough are not ranked as highly for habitat, likely due to the level of degradation at those stream mouths. The bay has herring spawning. The only documented Sand Lance and Surf Smelt spawning is in Larrabee State Park. PHS Region data identifies saltwater wetlands within at the mouth of Colony Creek and in the reach to the south. PHS data also notes Samish Bay as a having high counts for shorebirds, especially Dunlins and Western Sandpipers.

Samish Bay in general does not rank high for shoreline process. Coastal landform type is predominantly No Appreciable Drift (NAD). There are no feeder bluffs. The PSNERP recommendation for the Samish River Delta is *Restore*.

### Zoning and Land Use

Zoning is generally Agricultural - Natural Resource Lands (Ag-NRL). Land use is predominantly farming (Figure 3). Larrabee State Park is located on the coast at the north end of the bay. There are DNR managed forestlands located a short distance inland in the northern portion of the Bay. On the shoreline there are two NRCS Wetland Reserve Program easements and a Skagit County Farmland Legacy Program agriculture easement.



Figure 3: Agricultural lands in the Samish Basin.

Photo Andy Cline

### **Padilla Bay Unit**

Overall, Padilla Bay ranked high in the CVA for both habitat and process. For shoreline processes, 8 reaches ranked in the top tier and 10 in the second. For habitat function, 8 reaches ranked in the top tier and 8 in the second. Overall, 15 out of 20 reaches ranked high for conservation values.

#### Shoreline with Conservation Values and Protection Potential

Of the 15 reaches that were analyzed for protection feasibility, six ranked highly. Four were designated as high priority and 2 as priority with limited opportunity. There is one additional reach of interest that did not rank high for conservation values.

Most Samish Island reaches are not feasible for protection due to the high level of parcel fragmentation and development, with only two out of nine listed as priorities for protection. The Bayview reach is similarly developed and is not a protection priority. Additional reaches without good protection potential include the Padilla Bay Shore Trail reach because it is managed by the DOE as working agricultural lands. The South Padilla Bay tidelands reach (no. 24) is a water parcel and owned by a hunting club.

Future development potential varies in the Padilla Bay Management Unit, but the findings may point to protection strategies that seek to reduce development potential close to the shoreline. It is high for the ranked Samish Island reaches, Fish Point to Scott Point and Western Samish Island, with 79

theoretical potential housing sites. It is also high for the Padilla Bay National Estuarine Research Reserve (PB NERR) reach with 73 theoretical potential residential sites. While potential housing sites may be located on the shoreline, they may also be instead located further inland. This is due to large properties with development potential being counted in the assessment, although the lot has limited marine shoreline. *See Appendix C for detail.*

Reach #	Name	# of Agg. Parcels	Avg. Size (Ac)	Notable	Zoning	Process Rank	Habitat Rank	Local Analysis / Plan	PRIORITY
10	Samish Island Fish Point to Scott Point	5	26.1	Large area owned by non profit religious organization.	RRv	High	High	yes	yes
15	Western Samish Island	14	11.4	SLT has 4 CE's here. Non-protected properties include the camp of a non-profit youth organization (37 ac total), and a 9 ac and a 6 ac parcel.	RI	Medium High	Medium High	yes	limited opportunity
18	North Padilla Bay	8	57.6	180 ac, 73, 78, 46, 45, 21	Ag-NRL	High	Medium High	no	yes
20	Padilla Bay NERR	35	13.3	Padilla Bay NERR, Bayview State Park. Most parcels are small, but several large - 142 ac (28 TN), 135 ac (25 TN), 30, 25, 14, 10, 9, 8	RRv	High	High	yes	yes
23	Little Indian to Telegraph Slough	10	79.0	Almost entire peninsula owned by single company.	Ag-NRL	Medium High	Medium High	yes	yes
25	N entrance to Swinomish Channel	10	21.5	Hwy 20 is a major influence. Single company landowner has 189 ac parcel.	Ag-NRL	Medium High	High	yes	limited opportunity

Table 2: Priority Protection Reaches for the Padilla Bay Management Unit

While the Joe Leary Slough reach (no. 19) did not rank high enough to be included in the feasibility assessment, it's still an area of interest. It ranks medium high in the CVA for process. It is one of few freshwater sources to the bay (Figure 4). The degraded condition of some portions of this area likely contributed to it not being identified in the data sets used for this analysis, however there is significant potential for protection and restoration.



Figure 4: Freshwater from Joe Leary Slough finds its way to Padilla Bay along diked shorelines and passing through coastal wetlands.

Photo from the WA State Coastal Atlas. Copyright © 1994-2014. Washington State Department of Ecology. All rights reserved. Washington State Department of Ecology (Ecology), PO Box 47600, Olympia, WA 98504-7600, 360-407-6590. <https://fortress.wa.gov/ecy/coastalatlantools/ShorePhotos.aspx>

## Conservation Values

Padilla Bay encompasses strong conservation values for both habitat and shoreline processes. It is known and studied for its abundant eelgrass meadows. WDFW Habitat notes that Samish Island is especially important habitat for clams, Dungeness crab, Surf smelt, large regular concentrations of waterfowl, Audubon's bird polygons, red and green sea urchins, dune grasses, and NWI wetlands. The rest of the Bay is important habitat for many species, including eelgrass, crab, NWI wetlands, oyster, large regular concentrations of shorebirds and waterfowl, and Audubon's bird polygons. Outside of Samish Island, the only documented smelt spawning is the PB NERR reach.

PHS Region data identifies the Bay as having important wetlands, noting coastal salt marshes, salt meadows, and brackish marshes. It notes high counts of shorebirds, especially Dunlins and Western Sandpipers, and also Least Sandpipers, Killdeers and Black-bellied Plovers.

Samish Island has a variety of coastal landforms. While part of the shoreline is modified through bank armoring, there are long sections of shoreline with feeder bluffs, especially on the southern shoreline. There are also accretion shorelines, particularly in reaches 10 and 15. The NW point of the island is rocky. PSNERP nearshore recommendations designate most Samish Island reaches as *Restore High* for beaches and for embayments. One exception is reach 15, from the youth camp to the north being designated *Protect* (30% of reach). Another exception is reach 9, designated *Enhance*. The SMP Hydro analysis results are varied for the reaches, with those reaches on the south side of the island ranking higher than the north.

From the Samish land bridge to the southern part of Padilla Bay, the shoreline is predominantly classified as No Appreciable Drift (NAD); NAD-Delta in the north and NAD-Low Energy or -Artificial in the south. DNR ShoreZone data classifies the majority of the shoreline as modified. The northern part of the Bay to Bayview is designated by PSNERP as *Restore High* for the Beach and Embayment landscape groups. The Padilla Bay Shoretrail to Telegraph Slough is designated *Restore High* for Embayments. The SMP Hydro analysis reach rankings for the Bay are generally medium to low, with the exceptions of Padilla Bay NERR and Bayview.

## Zoning and Land Use

Zoning in Padilla Bay is mixed. Most reaches are dominated by Rural Intermediate (RI), followed by Ag-NRL and Rural Reserve (RRv) zoning classification. Land use is also mixed. Samish Island and Bayview are residential developments, while the remaining area is predominantly agricultural. Padilla Bay NERR is located on the Bay, as well as the small and developed Bayview State Park. The Padilla Bay shoretrail runs for several miles along the south eastern portion of the Bay, with the lands bordering it owned by the State DFW, State DOE and Padilla Bay, and largely managed for agriculture. There is another WDFW property in the north east part of the bay, just south of the land bridge to Samish Island.

## **Swinomish Unit**

Ten out of 15 reaches ranked high for conservation values. McGlenn Island and Turner Bay were included as part of the Swinomish management unit, although they are not designated as such in the

SMP Analysis. Six reaches ranked in the top tier for habitat and three in the second tier. Nine reaches ranked in the top tier for shoreline processes and one in the second tier.

Shoreline with Conservation Values and Protection Potential

Of the ten reaches analyzed for the protection feasibility assessment, three are designated as having protection priority; however any conservation projects would be conducted in partnership with the Swinomish Indian Tribal Community. McGlinn Island may also have protection potential. Some parcels within this reach are owned by the tribe; other parcels have unclear ownership. Projected future residential development is high only for the Turner Bay / N Snee-oosh Rd reach, where there is a landowner with 33 development rights, with most of the property located inland. *See Appendix C for detail.*

Reach #	Name	# of Agg. Parcels	Avg Size (Ac)	Notable	Zoning	Process Rank	Habitat Rank	PRIORITY
30	Turner Bay East	4	13.5	Tiny reach, 1 shoreline parcel, 3.6 acres.	SF-NRL, RRv, RMI	High	Medium High	partner with tribe
31	Turner / N Snee-oosh Rd	7	90.3	Includes 407 acre aggregated parcel owned by development company with 20 potential buildout sites (mostly inland), and another parcel with 13. Located in the northern half of the reach. 4 other private parcels, 15 ac, 11 ac, 10 ac, 2.5 ac. One large tribal parcel.	SF-NRL, RRv, RRc	High	High	partner with tribe
97	Turner's Bay	3	12	1 large, 1 mid, 1 small	RRv, RMI	High	Medium High	partner with tribe
108	McGlinn Island	0	0	Land primarily owned by U.S. Dept of Interior. One area with no parcel numbers.	OSRSI	High	Medium Low	partner with tribe

Table 3: Priority Protection Reaches for the Swinomish Management Unit. There is no rural buildout data for the McGlinn reach.

Conservation Values

There is herring spawning along the western and southern coastlines. Surf smelt spawning sites are present within seven of the reaches and Pacific Sand Lance spawning within one reach. Eelgrass is present along much of the shoreline, with the exception of the Swinomish Channel.

PSNERP site recommendations for Turner's Bay east to the Kiket mainland are *Protect* for Beach and *Protect High* for Embayment. From Snee-oosh Rd to the south of Kiket along Pull-and-Be-Damned *Restore High* is recommended for Beach and *Restore* for Embayment. The NW section of the Swinomish Channel is designated *Restore High* for the Coastal Inlet and Embayment strategies. Turner's Bay to N of Kiket ranks highly in the SMP Hydro analysis, as do Lone Tree, the southern coast of the reservation, and McGlinn.

## Zoning and Land Use

Shoreline zoning from Kiket Island to north of the developed area in the Swinomish Channel is Swinomish Urban Growth Area (UGA). Smaller segments of shoreline are Rural Reserve (RRv), Rural Resource – Natural Resource Lands (RRc-NRL), Secondary Forest – Natural Resource Lands (SF-NRL), and Ag-NRL. There is a small section of shoreline on the west side of Turner’s Bay that is Rural Marine Industrial (RMI) and McGlenn Island is predominantly Public Open Space of Regional / Statewide Importance (OSRSI) and some Ag-NRL. The Swinomish Unit shoreline is largely parceled into small developed properties, with Turner Bay and parts of the Channel as exceptions.

## **Islands Unit**

The Island management unit is the only one where there are reaches from both the San Juan Islands basin (33 reaches) and the Whidbey basin (5 reaches). Twenty-one out of 38 reaches ranked high in the Conservation Values Analysis. Twelve reaches ranked in the top tier for shoreline processes and eleven ranked in the second tier. Nine ranked in the top tier for habitat and seven ranked in the second tier.

## Shoreline with Conservation Values and Protection Potential

Of the 21 reaches analyzed for protection feasibility, six are designated as having high protection priority and five designated as high priority, but with limited opportunities.

Future residential development potential varies in this management unit. It is fairly high along the Miller Bay / Dewey / Similk reach, due to a couple of properties with potential for subdividing. There is moderate potential on Sinclair and Guemes islands. *See Appendix C for detail.*

Due to the variability and large area of the Island Management Unit, the protection potential, conservation values, and zoning is described separately for each island.

Reach #	Name	# of Agg. Parcels	Avg Size (Ac)	Notable	Zoning	Process Rank	Habitat Rank	PRIORITY
52	Sinclair East	20	12.07	8 large parcels. Most of Cypress is large lots. Lost barrier embayment that could be restored? Airstrip.	RRv	High	Medium Low	yes
55	Sinclair North	13	17.65	Large parcels.	RRv	High	Medium High	yes
66	Cypress West	34	5.49	17 ac, 16 ac, a few more. SLT has 2 CEs and SJPT has 2 small CEs	RRv	High	Medium Low	limited opportunity
69	Guemes North - Clark Point, Young's Park, North Beach	28	9.54	Many small, but 10 parcels over 10 ac, including 81 ac (7 TN). Shoreline very intact.	RI & RRv	High	High	yes
70	Guemes East - North Beach to Seaway Hollow / Starfish Rock	11	2.3	Most small, except 62 ac (5TN), 57 ac, 26 ac, 12 ac. A SJPT CE.	RI	Medium High	High	limited opportunity
71	Guemes East - Boat Harbor	11	15.89	Larger parcels, incl 61 ac (5 TN), 45 ac, 22 ac, 20 ac, 15 ac, 10 ac. Connectivity potential with SLT and SJPT protected lands.	RRv	Medium Low	High	yes
73	Guemes South - ferry, Deadman Bay	84	6	Little opportunity due to South Shore Drive, but connects to protected lands, wetlands. Most parcels small, but some large - 120 ac (6 TN), 91 ac (8 TN), 56 ac, 43 ac, 25 ac, 23 ac, 19 ac, 11 ac.	RI & RRv	High	Medium Low	limited opportunity
75	Guemes - SW	22	8.54	52 ac, 32 ac, 28 ac, 18 ac, 17 ac, 11 ac	RRv	High	Medium Low	yes
77	Guemes West - Indian Village, West Beach	56	0.9	One parcel of interest that connect to larger, inland parcels with same owner	RI	High	Medium Low	limited opportunity
87	Burrows Bay	139	1.35	SJPT has multiple fee simple and CE properties in S portion of Bay. Very little opportunity. One parcel of interest that connect with southernmost SJPT property. 14 ac (5TN), 11 ac (4TN)	RI	High	Medium High	limited opportunity
93	Miller Bay / Dewey Beach / Similk Bay	223	1.56	4 three acre properties with FBE's just S of Similk beach. Also 4 largish properties: 57 ac (22 TN) owned by lumber company, with little shoreline (300 ft?) and mostly inland forest. A 43 ac (17 TN) owned by private landowners in Miller Bay, 700 ft waterfront and in process of developing sites for houses. A non profit has 19 ac (3 TN), 500 ft waterfront. A 16 acre (6 TN) that is contiguous with 43 ac. development.	RI	High	High	limited opportunity

Table 4: Priority Protection Reaches for the Islands Management Unit

## Fidalgo Island:

The Miller Bay / Dewey Beach / Similk Bay West reach (no. 93) is highly divided among many small residential parcels, the majority of which are already developed (Figure 5). There are four larger properties. One, or possibly two, of these properties appear to be in the process of subdivision and development.



Figure 5: Residential development in Similk Bay has resulted in a highly divided shoreline and minimal potential for permanent land protection.

Photo from the WA State Coastal Atlas. Copyright © 1994-2014. Washington State Department of Ecology. All rights reserved. Washington State Department of Ecology (Ecology), PO Box 47600, Olympia, WA 98504-7600, 360-407-6590. <https://fortress.wa.gov/ecy/coastalAtlas/tools/ShorePhotos.aspx>

The Burrows Bay reach (no. 87) is also highly divided by residential development. They may be parcels of interest that connect with properties protected by San Juan Preservation Trust (SJPT). Dominant zoning is Rural Intermediate (RI) zoning classification.

Reaches along March's Point ranked high in the Conservation Values Assessment, but land protection feasibility is very low and no reaches were selected as a priority. It is zoned as part of the Anacortes Urban Growth Area.

The Miller Bay / Dewey / Similk reach ranks high for Conservation Values for both Habitat and Process. The DFW Habitat study ranks the reach as medium and lists it as important habitat for Dungeness crab, smelt, herring spawning, eelgrass, brown kelp, shrimp, Bald Eagle nests, Coast Resident Cutthroat, red and green sea urchins, and clams. PHS data notes the area for herring spawning, as well as two long Surf smelt spawning beaches. Burrows Bay ranks high for shoreline process conservation values and medium high for habitat. The DFW study notes that the Burrows Bay reach rates moderately high for habitat and is important for urchin, shrimp, dune grasses, Dungeness crab, eelgrass, NWI wetlands, smelt, and clams. PHS data shows one smelt spawning site.

The shoreline along Similk Bay includes modified, rocky bluffs, and some feeder bluffs. PSNERP designates the Beaches as part *Restore* and part *Enhance* and designates the Embayments as mainly *Restore* and partially *Enhance High*. The SMP Hydro analysis rates the quality as moderate. Shoreline along Burrows bay includes feeder bluffs, transition zones and accretion shorelines. PSNERP designates the area as *Restore High* for Beaches and *Enhance High* for Barrier Embayments.

## Sinclair Island:

There are four shoreline reaches on this island, two of which ranked highly in the Conservation Values Assessment for shoreline processes. In general, lot sizes are large, which increases protection feasibility. Zoning is Rural Reserve (RRv). The island is almost completely privately owned, with one WDFW parcel on the South East side and two inland parcels protected by SJPT, one fee simple and one CE.



Figure 6: Photo of NE coastline of Sinclair Island.

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The DFW Habitat study lists the habitat on the northern and eastern shorelines of Cypress as especially important for clam, urchin, brown kelp, crab, smelt, NWI wetlands, and eelgrass. The entire island is part of the PHS region Samish Bay Islands, which also includes Jack and Vendovi. It is noted as a steep sided rocky / forest island in the Samish Bay / Rosario Strait vicinity, home to bald eagle and seabird colonies. There is no documented sand lance or surf smelt spawning.

Coastal landforms of Sinclair include feeder bluffs, transition zones, rocky shorelines and limited accretion shorelines. PSNERP designates the North East part of the island has Protect for Beaches and Restore for Barrier Embayments. It also identifies a historic coastal embayment (Figure 6).

#### Cypress Island:

The Cypress West reach (no. 66) is one of the only areas on the island with residential development. Zoning is Rural Reserve. Within the reach, SLT has CE's on a 24 acre and a 75 acre property (Figure 7). SJPT has CE's on two smaller properties. The other reach on Cypress that ranked high in the Conservation Values Assessment is owned entire by WA DNR, as is the majority of the island.



Figure 7: Cypress Island shoreline property with a conservation easement held by Skagit Land Trust.

Photo Christine Farrow

The Cypress West reach is noted in the DFW Habitat study to be important habitat for red and green sea urchins, sargassum, brown kelp, eelgrass, NWI wetlands, crab, and clams. There is no documented sand land or surf smelt spawning. A short segment of the reach is categorized in PHS Region data as Cypress Island Wetlands.

Cypress Island shorelines are predominantly rocky or feeder bluff. The Cypress West reach has feeder bluffs, including some talus bluffs, and some transition zone and accretion shorelines. The PSNERP

Beach strategy site recommendation for the northern  $\frac{2}{3}$  <sup>rd</sup>s of the reach is *Protect* and the southern area is *Protect High*, with a yet smaller area as *Restore High*.

#### Guemes Island:

Seven out of nine Guemes Island reaches ranked high in the Conservation Values Assessment and of these, three have high protection priority and three have limited protection opportunities. Zoning is predominantly Rural Intermediate and Rural Reserve. There are several protected lands inland which include DNR, SJPT and SLT. There are also several SJPT shoreline easements and preserves, one of which is a wetland on the east end of the south coastline. WDFW owns the area around Square Harbor.

The WDFW Habitat study notes that Guemes shorelines are important habitat for many different species, likely due to the variability of shoreline types. Some of the most noted species are red and green sea urchins, sandlance, dune grasses, sargassum, Dungeness crab, clam, bull kelp, eelgrass, NWI wetlands, Audubon’s bird polygons, and oyster.

PHS Region data identifies “Guemes Island Wetlands”, with especially notable areas in reaches 70, 73 and 75. There is a large wetlands area in reach 74 that is already protected. There are two documented sand lance spawning beaches in reach 69, on the western side of the northern point. The south eastern part of the island is a herring holding area.



Figure 8: Feeder bluff on Guemes Island.

Photo SLT files

Guemes Island contains many types of coastal landforms. Feeder bluffs are present along the northern, southern and eastern shorelines (Figure 8). Accretion shorelines are present along many sections of island coastline as well. At the southeast part of the island it is NAD-Bedrock (plunging rocky shoreline). Modified shorelines are present in many areas, but are not extensive. PSNERP ranking for beaches varies, most notably the southern coastline is *Restore High* and the northern point and two other short sections are ranked *Protect*. For Barrier Embayments, over half of the islands shorelines are designated *Restore*.

### Skagit Delta

There are sixteen reaches included in the Skagit Delta management unit. In the Conservation Values Analysis, four of these reaches ranked highly. It is important to note that reach 110 is the longest reach in Skagit County and encompasses the outer shoreline of the Delta, from Sullivan Slough to the south fork of the Skagit at the County line. Other reaches in the Delta extend inland, encompassing

tidally influenced reaches of the Skagit and associated sloughs. Six reaches ranked in the second tier for process, and two reaches ranked in the top tier and five in the second tier for habitat.

Shoreline with Conservation Values and Protection Potential

Two reaches ranked as a priority for protection. The other two reaches that ranked highly in the CVA are Wiley Slough and a portion of the South Fork of the Skagit. Both are already owned and managed by WDFW. *See Appendix C for detail.*

Reach #	Name	# of Agg. Parcels	Avg Size (Ac)	Notable	Zoning	Process Rank	Habitat Rank	PRIORITY
110	Skagit Delta - outer edge	48	54.8	Limited opps due to agricultural land and dikes. 110 ac commercial landowner property with 2,300' on N Fork Skagit has 21 TN; another property mostly inland has 7 TN.	OSRSI waterward / Ag-NRL inland	Medium High	Medium High	yes
119	Skagit Delta - Hall Slough	4	60.8	200 ac. and 28 ac. parcels and two tiny parcels. Area largely in agricultural easements.	OSRSI waterward / Ag-NRL inland	Medium Low	High	limited opportunity

Table 5: Priority Protection Reaches for the Skagit Delta Management Unit

Conservation Values

The DFW Habitat study indicates that habitat quality varies along the Delta, with lower ranked habitat along the North Fork. Delta habitat is especially important for Sockeye, Coho, Bull Trout, Chinook, Coast Resident Cutthroat, Waterfowl, NWI Wetlands, Steelhead, Shorebirds, low salt marsh, high salt marsh, and sedges. Eelgrass is present in all of Skagit Bay. PHS Regions are many and include the Skagit Bay waterfowl staging and wintering area, saltwater wetlands and Skagit River delta wetlands. PHS notes high counts for shorebirds, especially Dunlins and Western Sandpipers, and also Least Sandpipers, Black-bellied Plovers, Killdeers, and Sanderlings.

The shoreline is NAD-Delta. PSNERP categorizes the Skagit Delta as *Restore High* – one of only two deltas in the Puget Sound that receive such a high rating.



Figure 9: The south fork of the Skagit River. The outer delta are pictured is managed by WDFW and inland is diked agricultural lands.

Photo from the WA State Coastal Atlas. Copyright © 1994-2014. Washington State Department of Ecology. All rights reserved. Washington State Department of Ecology (Ecology), PO Box 47600, Olympia, WA 98504-7600, 360-407-6590. <https://fortress.wa.gov/ecy/coastalatlantools/ShorePhotos.aspx>

Zoning and Land Use

Zoning is OSRSI (a zoning category mostly reserved for lands in public ownership), on the waterward side of dikes and Ag-NRL on the landward side (Figure 9). The South Fork of the Skagit is also zoned OSRSI, as it is managed by DFW. There are waterward parcels managed by WDFW in the North Fork vicinity. From the dikes inland, the land use is agricultural. There are numerous agriculture easements held by Conservation Futures and Skagitonians to Preserve Farmland.

## **Anacortes**

Out of sixteen reaches in the Anacortes management unit, two ranked high in the Conservation Values Assessment, Weaverling Spit and Shannon Point. Shannon Point ranked in the top tier in the CVA for Process. Weaverling Spit ranked in the top tier for habitat. Areas that ranked in the second tier for habitat include the Ship Harbor Wetland reach and shorelines west of Lovric's Marina, northwest of Weaverling Spit, and along the southern part of Fidalgo Bay.

The entire management unit is zoned City. The Weaverling Spit shoreline reach is owned primarily by the Samish Indian Nation and a small section by a private development company. The reach is designated as a priority for protection in partnership with the Samish Indian Nation. The Shannon Point reach ownership by Western Washington University precludes it from legal land protection. It is important to note that WWU and Northwest Straits are actively pursuing restoration of the shoreline.

Weaverling Spit received the highest score possible in the DFW Habitat study, with the most important species identified as hardshell clams and crab. Pacific Sand Lance and Surf smelt are present, as well as herring spawning in the nearshore. Eelgrass is also present. The beach is ranked by PSNERP as *Restore* and the inner portion of the spit designated a coastal inlet and ranked *Enhance High*. The Samish Indian Nation has been working toward securing funding for restoration and replacement of the Tommy Thompson trail over Fidalgo Bay. There may be some conservation opportunity in partnership with the Samish Indian Nation to protect these important shoreline parcels.

## **Discussion**

Skagit Land Trust views this assessment as a working document and will use it as a tool to guide landowner outreach and protection efforts. Opportunities for protection are greater than expected, with several Skagit County shoreline areas that have not been heavily divided by residential or industrial development. The greatest opportunities lie in the islands, with less dense residential development and the absence of agricultural dikes.

The next steps for SLT are to talk with partners, identify the most important parcels within the priority reaches, and then to do a landowner outreach campaign. If there are landowners who are voluntarily willing to conserve their property, SLT will need to secure funding for protection and stewardship. SLT welcomes input from conservation partners about the importance of additional shoreline areas. Ecologically valuable shoreline properties that do not fall within a priority reach will still undergo a project evaluation and be considered for protection.

## **Tidelands Protection Assessment**

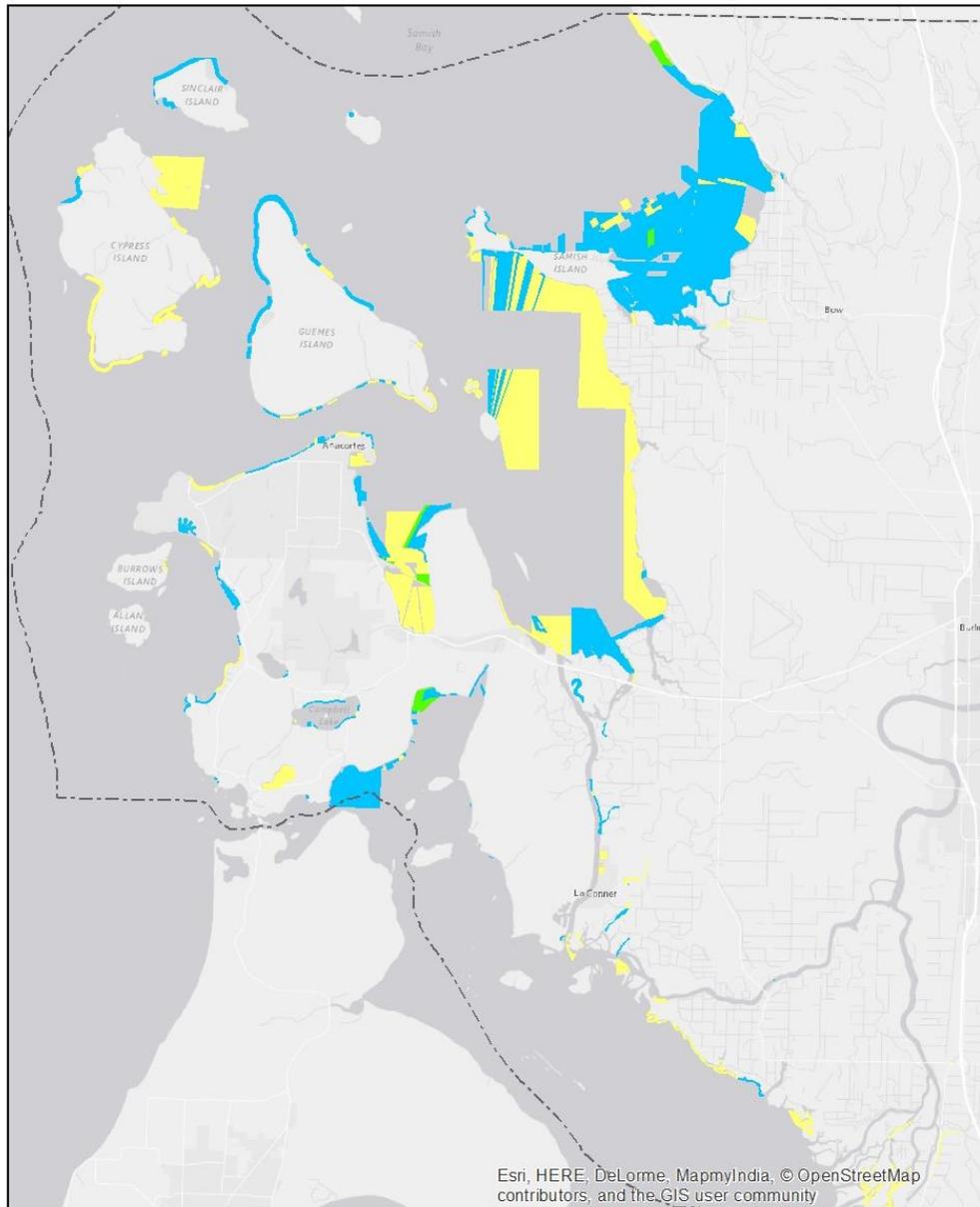
The majority of marine aquatic lands in Skagit County are owned by the State of Washington, and managed by the Washington State Department of Natural Resources. However, there are also over 1,100 private tideland parcels. Tideland owners that are identified as "Public" in this assessment include the State and Federal Government, Bureau of Indian Affairs, local Dike Districts, Port Authorities, and non-profits such as universities, churches and land trusts. (Map 5: Tidelands Public and Private Ownership).

The County assessed value of tideland parcels tends to be quite low and annual taxes are therefore minimal. Roughly one third of private parcels have an assessed value of \$1,000 or less. The assessed value of tidelands is variable, but is typically below \$100 per acre. While County assessed value does not necessarily reflect market value, the low value tends to hold true. Market value for conservation acquisitions is determined by appraisal. In general tidelands that have shellfish growing potential will appraise somewhat higher. However, because of the generally low value, tideland owners often have little incentive to sell; this is especially true for smaller parcels. Motivation to protect tidelands generally comes from a landowner being personally inclined toward conservation.

Another complication in the protection of tidelands is that it is often difficult to determine the legal boundaries of a parcel. In fact, many of the typical "due diligence" methods that are routine for other types of land acquisition become much more challenging in relationship to tideland acquisition, including title review, surveying, and appraisal work.

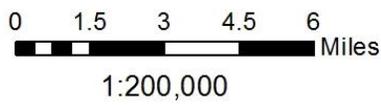
Skagit Land Trust (SLT) is primarily interested in protecting tideland parcels connected to marine shorelines, or uplands, where SLT is or will be the holder of a conservation easement (CE). Ownership of a Skagit County tideland parcel is usually linked to a contiguous upland parcel (Figure 10). If there is a landowner willing to protect their property, he/she is often willing to protect the tidelands as well. SLT is also willing to pursue protection of larger tidelands parcels, especially in areas determined to be important by conservation partners, such as WADNR or Padilla Bay NERR.

# Skagit County Tidelands Public and Private Ownership



**Legend**

- Public (Tax Exempt)
- Private (Non Tax Exempt)
- Tribal (Non Tax Exempt)
- County Boundary



Data Source: Skagit County Assessor's Data 2014

Care was used during the compilation of this map to ensure accuracy. However, due to changes in ownership and the need to rely on outside information, Skagit Land Trust cannot accept responsibility for errors or omissions, and, therefore, there are no warranties which accompany this material.

Map 5



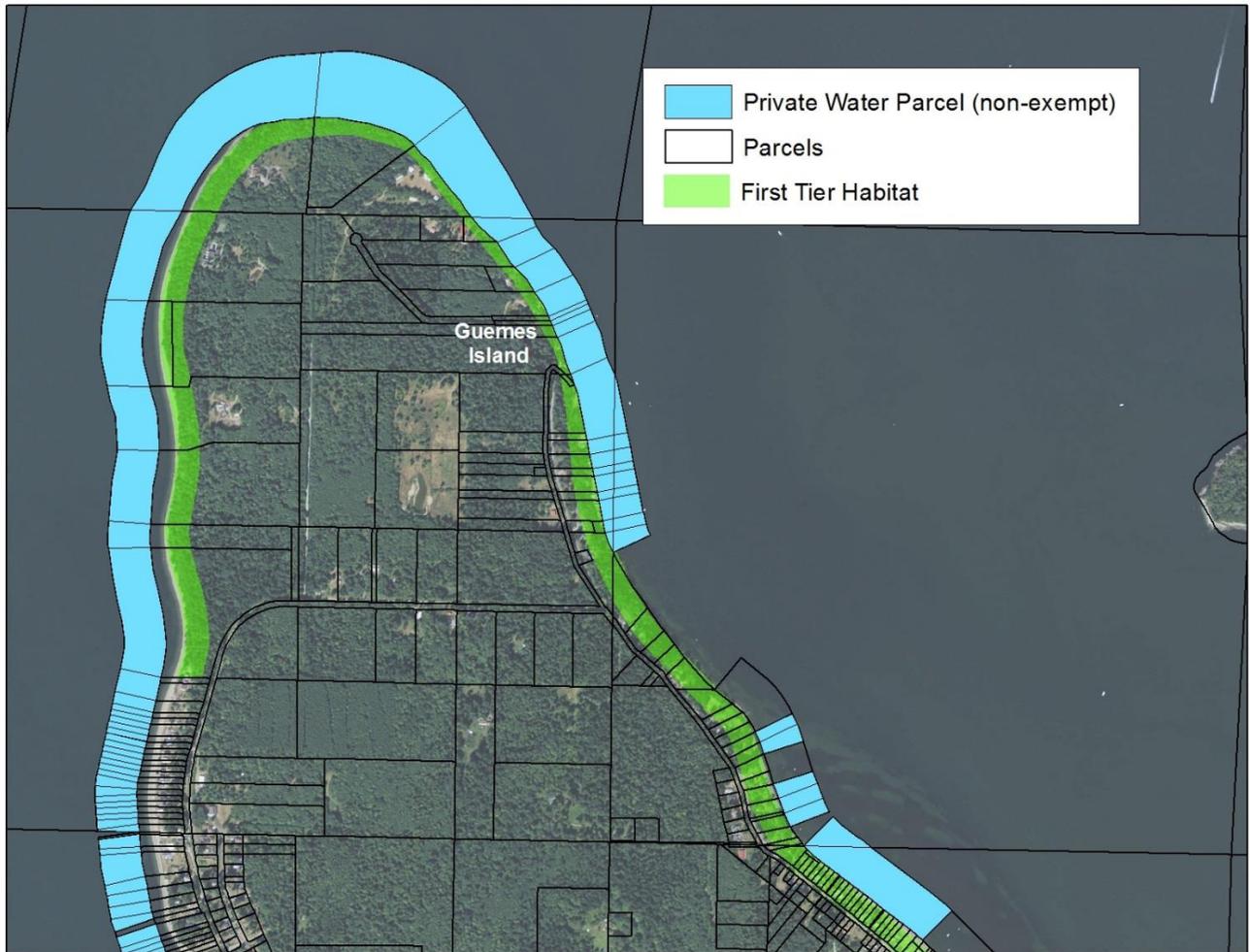


Figure 10: Tideland parcels linkage with shoreline parcels. Tideland parcel ownership is not always linked with the shoreline property owner, but it is often the case.

SLT helped to establish Fidalgo Bay Aquatic Reserve by partnering with several state agencies to protect South Fidalgo Bay. The Trust secured funds for acquisition of a total of 532 acres of private tidelands in South Fidalgo Bay, and facilitated the transfer of these areas to the WA State Department of Natural Resources. The Trust retained a conservation easement on these tidelands, ensuring that the area would only be managed only as habitat, not for any commercial purposes. With appropriate funding, SLT can continue to play this role if a need arises.

### Methods

Current assessor's data (February 2014) was used to analyze tidelands. Assessor's data is squirrely, due to irregularities within the parcel data and single parcels sometimes being linked with many landowners and sometimes other parcels. In addition, tideland acreage is often not a part of the assessor's records. It is possible to estimate parcel area based on polygon size, but in order to get an accurate area, a surveyor is necessary.

All parcels with exemptions were selected in order to isolate those with public ownership. Exemption categories included: EX; EX.BIA; EX.CITY; EX.DOR; EX.FED; ED.MISC (dike); EX.PORT; EX.ST. There are 489 public water parcels. All parcels without exemptions were also selected in order to isolate those with private ownership. There are 1122 private water parcels.

There are some tribally owned parcels that are not categorized as exempt. A new separate data layer was created for this category that encompasses 20 parcels owned by Swinomish Indian Tribal Community, Samish Indian Nation and Upper Skagit Indian Tribe.

Due to the unique ownership patterns of tidelands in Samish Bay their designation as oyster lands, a data layer was created with major tidelands owners for Samish Bay.

### Description of Tidelands by Management Unit

#### **Samish Bay Unit**

This Bay contains the most significant area of privately owned tideland in the County. The northern and central part of the bay rank from “medium high” to “high” for habitat values and is notable for eelgrass. Many tideland parcels are large and single landowners own multiple parcels. Samish Bay is unusual because most of the tidelands are designated in the assessor’s data as Oysterlands (Neighborhood Code 420). However, some of the tidelands are not used for oyster farming. Commercial shellfish harvest data is from the Department of Health and represents currently licensed locations for shellfish companies including shippers, packers and harvesters. GIS locations are not all accurate. *Appendix B: Maps -- Samish Bay Tideland Ownership*

#### **Padilla Bay Unit**

A large majority of the tidelands is public and much of it owned by the WA Department of Ecology (DOE). Padilla Bay NERR has worked to protect tidelands in the bay and the purchase of remaining private tidelands is part of their management plan. Along Samish Island and Hat Islands, the private tideland parcels are very narrow and long. In the Southern portion of the Bay, tideland parcels are larger and owned by fewer individuals / groups. The hunting group Dike Island Gun Club owns several parcels and the Blue Chip Gun Club owns tidelands around the dredge islands. Another owner that is a possible hunting group is the Swinomish Club. There is one large parcel in the SW corner of the Bay that appears as one parcel, but is actually 150+ different parcels, including the DOE and many individuals.

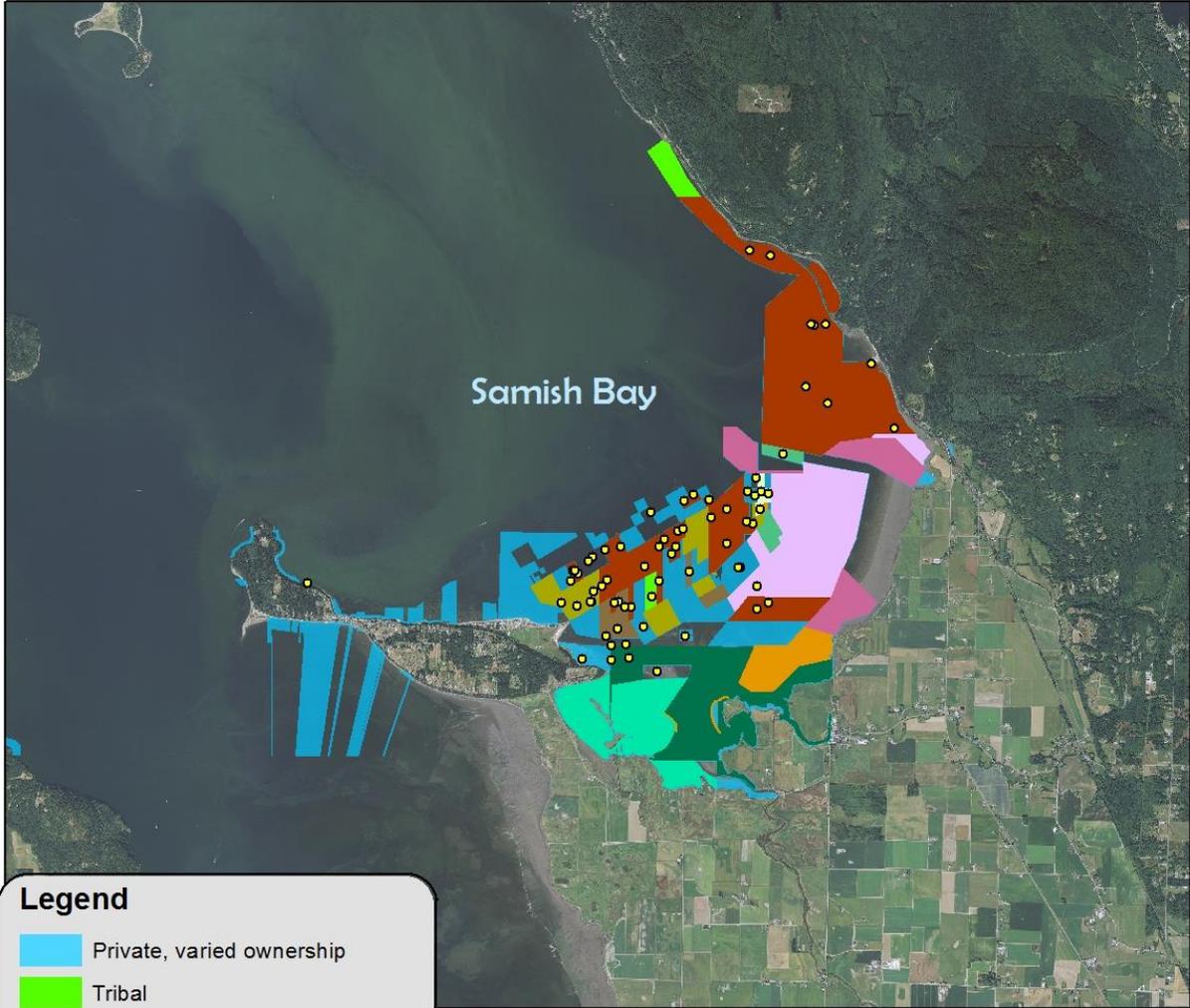
#### **Swinomish Unit**

There are 4 very small tidelands owned by a homeowner’s association, as well as three small parcels owned by different individuals. There is only one slightly larger parcel in Turner’s Bay.

#### **Islands Unit**

There are many private tideland parcels in the islands, most of them small. The majority of landowners own a single parcel. Due to the individual nature of each island, they are described separately.

# Samish Bay Tideland Ownership



**Legend**

- Private, varied ownership
- Tribal

**Major Tideland Owners**

- BLAU
- TAYLOR
- CHUCKANUT SHELLFISH
- HECKES
- L & C DYNASTY LTD
- MCCOY INVESTMENTS
- MORGAN
- PARKER
- PERTHOU
- SAMISH BAY SPORT CLUB INC

- Oyster Harvest Sites



Map 6

Data Sources: Skagit County Assessor's Data 2014, Department of Health Permit Harvest Sites

Care was used during the compilation of this map to ensure accuracy. However, due to changes in ownership and the need to rely on outside information, Skagit Land Trust cannot accept responsibility for errors or omissions, and, therefore, there are no warranties which accompany this material.



Fidalgo Island: Most tideland parcels in Similk Bay are very small, but there are several larger parcels. One is a 420 acre tideland parcel in Dewey Bay. . The shoreline in Dewey Bay ranks high for shoreline processes and for habitat functions. And, in the Similk Beach area the Swinomish Indian Tribal Community owns about half of the tidelands. Tideland parcels along Burrows Bay and Biz Point are small and predominantly individually owned. There is one long section owned by San Juan Preservation Trust (SJPT). There are several parcels owned by DelMar Community Service for recreational facilities for its members, especially around Biz Point and to the north of the SJPT tidelands.



Figure 11: Tidelands in Fidalgo Bay are owned by the WA State DNR, with conservation easements held by Skagit Land Trust.

Photo Jerry Haegele

Guemes: Approximately one-third of the islands' shoreline has private tideland ownership. Parcel size is generally small, particularly on the south side of the island, the northern point, and portions of the west and east shorelines. Guemes Island has several Focus Shoreline Areas for protection and tidelands should be included in any future land purchases or conservation easements.

Cypress: All tidelands are owned by the DNR, with the exception of one private parcel.

Sinclair: Approximately 40% of the shoreline has private tidelands. There are 14 individual parcels, with some contiguous parcels that represent larger ownerships held by family corporations, and the rest by individuals.

### **Skagit Delta Unit**

There are only 4 very small private parcels in the delta, only one of which is in the outer tidelands. All appear to be candidates for protection along with any shoreline protection through either ownership or CE.

### **Anacortes Unit**

Private tidelands in Anacortes and the UGA are largely marinas, moorage and/or have industrial uses, including the refineries. The main private tideland parcels of interest lie along the shoreline northwest of the Samish Bay RV Park. The shoreline is largely modified and is ranked by PSNERP as *Enhance High*. Eelgrass is present and herring spawn offshore.

### **Assessment Limitations**

This Shoreline Protection Assessment was based on existing databases and assessments from multiple sources, each of which has its own limitations and sources of error. In addition, there was

some data overlap among the studies. For example, coastal wetlands are a metric in the PSNERP Nearshore Strategies and in the SMP Analysis. There are problems inherent with using data at different scales; however, Puget Sound wide assessments can only be put to use when integrated with local information.

Including additional localized data, such as the location of pocket beaches and armoring and dikes, would improve the reach data and help with the identification of the highest priority parcels. SLT has the potential to add information as additional time and data become available. More work can also be done in identifying which tideland parcels overlap with the greatest habitat values.

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## Appendix A: Criteria Index

Attribute Field	Description	Source Data
Reach_No	Reach Number. Identification number for each reach of marine shoreline. 114 total. Based on Skagit County and Anacortes SMP updates. Reach breaks determined by changes in land use, armoring, shoreform, drift cell breaks, changes in vegetation, and wetland areas. Generally identified at the nearest parcel boundary. 23 reaches that are either completely protected or completely developed / industrial were not analyzed due to no protection potential.	The Watershed Company 2011
Reach_Name	Name given based on geographic location / attributes.	
Mgt_Unit	Management Unit. Originates from SMP update. These are larger areas composed of multiple reaches. Unit 1: Samish Bay; Unit 2: Samish Island, Padilla Bay, E Swin Channel; Unit 3: Swinomish Re; Unit 4: Fidalgo Island and other islands; Unit 5: Skagit Bay/Delta; Unit 6: Anacortes and UGAs	The Watershed Company 2011
Acre	Acreage of the SMP reach, encompassing reach length and shoreline to 200' inland.	The Watershed Company 2011
Reach_Length	Approximate measure of shoreline length.	
Waterbody	Noted if Puget Sound, Puget Sound Islands, River Delta.	
Drift_Cell	Coastal Landforms and Feeder Bluffs. Category of drift cell: Right to Left (RtoL), Left to Right (LtoR), No Appreciable Drift (NAD)	MacLennan et al. 2013
<b>Shoreline Processes Attributes</b>		
Coastal_LF_FB	Coastal Landforms and Feeder Bluffs. Dataset mapping all Puget Sound feeder bluffs and related coastal landforms. Reaches where more than one shore type is present is listed from greatest area to least, with estimated percentages for the dominant shore type(s). If 5% or less of total shoreline in unit was a unique shore type, it was not included, unless it was feeder bluff. Dataset does not include mapped pocket beaches in bedrock shorelines. Point values are as follows: Feeder Bluff (FB) or Feeder Bluff Exceptional (FBE) = 2; Feeder Bluff Talus (FBT) = 1; Accretion Shoreform (AS) = 1; Transport Zone (TZ) = .05; No Appreciable Drift (NAD) = 0.5; Modified (Mod) = 0. Each coastal landform value is calculated as percentage of reach.	Coastal Landforms DOE / CGS
FB_Presence	Informational only. Presence of feeder bluff in reach. Y or N	Coastal Landforms DOE / CGS
HFB	Historic Feeder Bluff (HFB or HFBE) data from the Coastal Landforms and Feeder Bluffs dataset. Shoreline that was historically FB or FBE that is now modified. Value is 1, calculated as a percentage of reach.	Coastal Landforms DOE / CGS

<p><i>Description:</i> <i>PSNERP</i> <i>Recommendations</i></p>	<p>Strategies for Nearshore Protection and Restoration in Puget Sound by the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP). Uses four different lenses. Study excludes rocky shorelines. Some caution needs to be exercised due to coarse scale. Study is done by basin; Skagit County falls within the San Juan and Whidbey Basins. <i>Protect High</i> category valued at 1; <i>Restore High</i> at 0.8; <i>Protect</i> at 0.6; <i>Restore</i> at 0.4; <i>Enhance High</i> at 0.2; <i>Enhance</i> at 0.0.</p>	<p>Cereghino et al. 2012</p>
<p>PSNERP_CI</p>	<p>Coastal Inlets. "Potential" metrics include embayment length, historical wetland area, size of watershed. "Degradation" metrics were lost embayment length, lost wetland area, tidal flow degradation and nearshore impervious. Southern Padilla Bay is designated <i>Restore High</i> and Southern Fidalgo Bay is <i>Enhance High</i>.</p>	<p>Cereghino et al. 2013</p>
<p>PSNERP_B</p>	<p>Beaches. "Potential" metrics include beach length and complexity, as measured by stream mouth density and barrier beach prevalence. "Degradation" metrics were sediment supply degradation, nearshore impervious, and parcel density metrics.</p>	<p>Cereghino et al. 2014</p>
<p>PSNERP_BE</p>	<p>Barrier Embayments. Use caution with this dataset, because large areas are rated based on the presence of smaller BE's. "Potential" metrics include size (wetland area and embayment length) and complexity (density, or count of discrete embayments/length of beach). "Degradation" metrics were sediment supply degradation, nearshore impervious and tidal flow degradation.</p>	<p>Cereghino et al. 2015</p>
<p>PSNERP_D</p>	<p>River Deltas. "Potential" metrics include delta size, system complexity and overall watershed area. "Degradation" metrics include lost delta length, lost wetland area, tidal flow degradation, nearshore impervious, and watershed impervious. The Skagit Delta is ranked <i>Restore High</i> and the Samish Delta <i>Restore</i>.</p>	<p>Cereghino et al. 2016</p>
<p>SMP_Hydrologic</p>	<p>Skagit County Shoreline Master Program (SMP) Hydrologic Reach Assessment. Marine metrics were: length of armoring, marine vegetation (for wave attenuation), tide gates, feeder bluffs. SMP value from 1 (low) to 5 (high); not individually scored in this analysis. Point values re-scaled 0 to 1.</p>	<p>The Watershed Company 2011</p>
<p>SMP_Ana_Rate</p>	<p>Anacortes SMP Update shoreline reach assesement. Anacortes SMP Functional Rating. This study is less detailed than that for the rest of Skagit County. Results include 5 different categories from Low to High. <i>High</i> category valued at 0.8; <i>Moderate High</i> is 0.6; <i>Moderate</i> is 0.4; <i>Moderate Low</i> is 0.2; <i>Low</i> is 0.0.</p>	<p>The Watershed Company 2009</p>

Nearshore Habitats and Species Attributes		
Description: Marine Nearshore Habitat Assessment	<p><i>Marine Nearshore Habitat Assessment (MSHA) by WDFW as part of the Watershed Characterization Assessment. Included 1/4 mile wide shoreline buffer. Study is done by basin; Skagit County falls within the San Juan and Whidbey Basins. <u>Index scores cannot be compared between the basins.</u> Provides two different indexes of relative conservation value based on habitat. Uses presence of 41 different species as an indicator of habitat function. LO models constructed for 10 species, which resulted in those species having many more shoreline segments with a non-zero value, notably dungeness crab. Assessment entails a Composite index (quantity of species) and a Top Five index (importance for individual species, or quality).</i></p>	Wilhere et al. 2013
DFW_Habitat_Index	<p>The Composite Index uses the normalized mean of all 41 species. A measure of the quantity of species using nearshore habitat. Sum of the amount of habitats (or normalized counts or densities of each species) for each shoreline segment. Limitation is the use of a "flat" structure index with all species weighted equally. Use the SumAll vigintiles (vig_SumAll), with shorelines ranked relative to each other in 20 categories. Where there were multiple values for the Unit, the dominant shoreline value was recorded. If extreme differences were noted between segments, an average shoreline index value was calculated based on % of shoreline. Index values scaled from 0 to 2.</p>	Wilhere et al. 2014
DFW_Habitat_TopFive	<p>the Top-5 Index uses the normalized mean of the five highest components in each shoreline segment. A measure of the importance, or quality, of nearshore habitat for particular species. An average of the five largest species values at a shoreline (most species values for each segment converted to density and normalized at 0 to 1 scale). Use TopFive vigintiles (vig_AvgTop5). Where there were multiple values for the Unit, the dominant shoreline value was recorded. Index values scaled from 0 to 1.</p>	Wilhere et al. 2015
SMP_Veg	<p>Skagit County Shoreline Master Program (SMP) Vegetation Reach Assessment. Assessment area is 200' wide along the upland area for the length of the reach. Marine metrics were: total vegetation, upland vegetation (tree, forest cover), % tree/shrub, slope &lt; 15%, severely erodable soils, length of armoring. SMP value from 1 (low) to 5 (high); not individually scored in this analysis. Point values re-scaled 0 to 1.</p>	The Watershed Company 2011

SMP_Habitat	Skagit County Shoreline Master Program (SMP) Habitat Reach Assessment. Based on habitat characteristics and species. Metrics were: area of wetlands (estuary, wetland, riparian habitat), PHS regions, Priority marine species (# within 500 ft of reach), forage fish spawning beach, shoreline alterations (length of armoring, overwater structures, tide gates), total vegetation, marine vegetation (eelgrass, <i>seagrass?</i> , kelp, dune grass, salt marsh), % tree/shrub. SMP value from 1 (low) to 5 (high); not individually scored in this analysis. Point values re-scaled 0 to 1.	The Watershed Company 2012
PSL	Pacific Sand Lance. Forage fish a part of DFW WCA study, but not weighted among the 41 species included. Due to the importance of forage fish to the marine food chain, PSL and Smelt are included individually. Also included in PHS Habitat study. Due to importance of species, also included as a separate index value. Data on if a spawning beach(es) is present.	WDFW 2012
Smelt	Surf smelt. Forage fish a part of DFW WCA study, but not weighted among the 41 species included. Also included in PHS Habitat study. Due to importance of species, also included as a separate index value. Data on if a spawning beach(es) is present.	WDFW 2012
Herring	Pacific Herring. "Spawn" and "hold" noted when habitat zone occurs within 400 ft of shoreline (within the reach buffer) at any point along the reach (i.e. it doesn't need to be within the 400' along the entire reach shoreline). Have noted "spawn / offshore" and "holding / offshore" when within less than 1 mile of shoreline.	WDFW 2012
Eelgrass_SV MP	Primary data source for presence of eelgrass beds. While eelgrass is included within DFW's Marine Habitats Assessment, it is unweighted and counted flat along with 41 other marine species, including plant and animal. Due to the importance of eelgrass to the marine nearshore, it is included as stand-alone criteria in addition to the Marine Habitats Assessment. Primarily used DNR's Puget Sound Eelgrass Monitoring Dataset from the Submerged Vegetation Monitoring Program (SVMP), collected from 2000-2012.	WDNR 2014
Eelgrass_SZ	Secondary data source for presence of eelgrass beds. Where there was "no data" for SVMP, used the DNR Shore Zone data, collected from 1994 to 2000.	WDNR 2001
Eelgrass_N	Normalized value for eelgrass, from 0 to 1. Primary data is SVMP data. Where there is no data, used ShoreZone (SZ) data. Patchy eelgrass (SZ) is tallied as 0.5 value of continuous. Values are recorded as a percentage of the shoreline reach with eelgrass presence. In the case of Shore Zone data with patchy presence, it was recorded as the percentage of the reach multiplied by 0.5.	

Local / Fine Scale Analyses		
CGS_Gepmorph	Coastal Geologic Services geomorphic assessments for Skagit County MRC. Includes March Point, North Fidalgo Island and Similk Bay. For each area, restoration sites are identified at three different tiers. Dataset is limited because it doesn't cover the whole County. Scale is very fine, at parcel level. Index value is 0.5 for tier 1 restoration sites and/or reaches with multiple sites. Value is .25 for tier 2 or tier 3 sites. (Important shoreline type data includes pocket beaches.)	Johannessen & MacLennan 2007; MacLennan & Johannessen 2008; MacLennan et al.
Recc_Blueprint_RSI	Skagit Bays Blueprint and Rapid Shoreline Inventories. These studies do not include all of Skagit County. Puget Sound Partnership study from 2003-04 analyzed potential forage fish spawning habitat, nearshore use by juvenile salmon, presence of aquatic vegetation, beach sediment supply and marine birds. It prioritized 21 sites for conservation, restoration and education. 8 reaches are ranked conservation and 4 restoration. Some restoration sites not noted due to restoration being completed or the Samish tribe taking lead. The Rapid Shoreline Inventories were done for Samish Island (2003), March Point (2001) and Guemes Island (2005). Five sites listed for Guemes. Point value 1 = "Conservation" and 0.5 = "Restoration". The data breaks down into the categories of vegetation, birds, forage fish, salmon, and sediment. Not available in GIS, but as map pdfs.	Clark et al. 2005; Bloch et al. 2006
PB_Plan	The Padilla Bay NERR 2008 Management Plan has a section on Future Acquisition Needs and Opportunities. (The Reserve owns over 11,000 acres of tidelands and marshlands.) Those include acquiring the remaining tidelands in Padilla Bay (450 acres in 2008). There is interest in the "Gun Club" property, which has multiple partnership, including the Reserve. Conservation easements of agricultural and buffer lands within the boundary on the southern end of the Reserve. Wetlands south of Hwy 20. Several critical habitat areas on Bayview Ridge, including aquifer recharge areas and wooded stream and drainage corridors with habitat value. Reaches that were specifically mentioned were scored at 1 pt, reaches	Padilla Bay NERR 2008
Misc_LocalPlans	Inclusion of protection and restoration plans listed for reaches within the Shoreline Master Program Analysis.	The Watershed Company 2011

## Appendix B: Reach Conservation Value and Parcel Metrics

Information about each reach that ranked high in the Conservation Values Assessment and the Protection Feasibility Assessment. Statistics from the categories “# of Parcels” and “Average Parcel Size” come from the Skagit County Assessors 2014 data. Statistics from the categories “# of Agg. Parcels” and “Average Agg. Parcel Size” come from the Draft Rural Buildout study done by Skagit County GIS. This study aggregated parcels that were contiguous and owned by a single landowner into a single polygon.

### Samish Bay Unit

Reach #	Name	# of Parcels	Average Parcel Size (Ac)	# of Agg. Parcels	Average Agg. Parcel Size (Ac)	Potential # housing sites	Notable	Zoning	Process Rank	Habitat Rank	Local Analysis / Plan	PRIORITY
1	N Samish Bay / Larrabee	16	4.33	7	3.24	0	Much of reach is Larabee State Park. 2 of 7 parcels are PSE. Really only 3 landowners - 2 with undeveloped land. Very narrow shoreline bordered by RR.	SF-NRL	Low	High	yes	limited opportunity
4	South of Colony	19	20.44	8	58.9	7	Several very large lots.	Ag-NRL	Low	High	no	yes
6	marshy island	2	18.91	2	73.73	2	Tiny reach. Marshy wetland with interior pond. Appears diked. Single corporation landowner.	Ag-NRL	Low	High	no	limited opportunity

## Padilla Bay Unit

Reach #	Name	# of Parcels	Average Parcel Size (Ac)	# of Agg. Parcels	Average Agg. Parcel Size (Ac)	Potential # housing sites	Notable	Zoning	Process Rank	Habitat Rank	Local Analysis / Plan	PRIORITY
10	Samish Island Fish Point to Scott Point	16	8.05	5	26.14	26	Large area owned by non profit religious organization.	RRv	High	High	yes	yes
15	Western Samish Island	30	4.9	14	11.4	53	SLT has 4 CE's here. Non-protected properties include the camp of a non-profit youth organization (37 ac total), and a 9 ac and a 6 ac parcel.	RI	Medium High	Medium High	yes	limited opportunity
18	North Padilla Bay	25	17.76	8	57.57	6	180 ac, 73, 78, 46, 45, 21	Ag-NRL	High	Medium High	no	yes
20	Padilla Bay NERR	64	3.86	35	13.34	73	Padilla Bay NERR, Bayview State Park. Most parcels are small, but several large - 142 ac (28 TN), 135 ac (25 TN), 30, 25, 14, 10, 9, 8	RRv	High	High	yes	yes
23	Little Indian to Telegraph Slough	28	17.55	10	78.98	16	Almost entire peninsula owned by single company.	Ag-NRL	Medium High	Medium High	yes	yes
25	N entrance to Swinomish Channel	26	5.84	10	21.54	4	Hwy 20 is a major influence. Single company landowner has 189 ac parcel.	Ag-NRL	Medium High	High	yes	?

### Swinomish Unit

Reach #	Name	# of Parcels	Average Parcel Size (Ac)	# of Agg. Parcels	Average Agg. Parcel Size (Ac)	Potential # housing sites	Notable	Zoning	Process Rank	Habitat Rank	Local Analysis / Plan	PRIORITY
30	Turner Bay East	3	9	4	13.5	1	Tiny reach, 1 shoreline parcel, 3.6 acres.	SF-NRL, RRv, RMI	4	2.95	0	partner with tribe
31	Turner / N Sneesh Rd	10	45.8	7	90.3	39	Includes 407 acre aggregated parcel owned by development company with 20 potential buildout sites (mostly inland), and another parcel with 13. Located in the northern half of the reach. 4 other private parcels, 15 ac, 11 ac, 10 ac, 2.5 ac. One large tribal parcel.	SF-NRL, RRv, RRc	4	4	0	partner with tribe
97	Turner's Bay	6	4.5	3	12	2	1 large, 1 mid, 1 small	RRv, RMI	4	2.95	0.5	partner with tribe
108	McGlenn Island	12	6.2	0	0		Land primarily owned by U.S. Dept of Interior. One area with no parcel numbers.	OSRSI	4	2	0	partner with tribe

### Skagit Delta Unit

Reach #	Name	# of Parcels	Average Parcel Size (Ac)	# of Agg. Parcels	Average Agg. Parcel Size (Ac)	Potential # housing sites	Notable	Zoning	Process Rank	Habitat Rank	Local Analysis / Plan	PRIORITY
110	Skagit Delta outer edge	175	18.7	48	54.8	49 TN (one property with 7 TN is mostly inland)	Limited opps due to agricultural land and dikes. 110 ac commercial landowner property with 2,300' on N Fork Skagit has 21 TN; another property mostly inland has 7 TN.	OSRSI waterward / Ag-NRL inland	2.95	2.95	0	yes
119	Skagit Delta Hall Slough	9	19.5	4	60.8	5	200 ac. and 28 ac. parcels and two tiny parcels. Area largely in agricultural easements.	OSRSI waterward / Ag-NRL inland	2	4	0	yes

## Islands Unit

Reach #	Name	# of Parcels	Average Parcel Size (Ac)	# of Agg. Parcels	Average Agg. Parcel Size (Ac)	Potential # housing sites	Notable	Zoning	Process Rank	Habitat Rank	Local Analysis / Plan	PRIORITY
52	Sinclair Island	24	8.07	20	12.07	8	8 large parcels. Most of Cypress is large lots. Lost barrier embayment that could be restored? Airstrip.	RRv	High	Medium Low	no	yes
55	Sinclair Island	16	8.38	13	17.65	10	Large parcels.	RRv	High	Medium High	no	yes
66	Cypress West	56	5.21	34	5.49	4	17 ac, 16 ac, a few more. SLT has 2 CEs and SJPT has 2 small CEs	RRv	High	Medium Low	no	limited opportunity
69	Guemes North	35	5.17	28	9.54	15	Many small, but 10 parcels over 10 ac, including 81 ac (7 TN). Shoreline very intact.	RI & RRv	High	High	yes, restore	yes
70	Guemes E - N Beach to Seaway Hollow	149	1.61	11	2.3	17	Most small, except 62 ac (5TN), 57 ac, 26 ac, 12 ac. A SJPT CE.	RI	Medium High	High	yes	limited opportunity
71	Guemes East - Boat Harbor	14	13.16	11	15.89	15	Larger parcels, incl 61 ac (5 TN), 45 ac, 22 ac, 20 ac, 15 ac, 10 ac. Connectivity potential with SLT and SJPT protected lands.	RRv	Medium Low	High	no	yes
73	Guemes South ferry, Deadman Bay	132	1.86	84	6	26	Little opportunity due to S Shore Dr, but connects to protected lands, wetlands. Most parcels small, but some large - 120 ac (6 TN), 91 ac (8 TN), 56 ac, 43 ac, 25 ac, 23 ac, 19 ac, 11 ac.	RI & RRv	High	Medium Low	no	limited opportunity
75	Guemes - SW	27	5.9	22	8.54	12	52 ac, 32 ac, 28 ac, 18 ac, 17 ac, 11 ac	RRv	High	Medium Low	no	yes
77	Guemes W - Indian Village	71	1.03	56	0.9	4	One parcel of interest that connect to larger, inland parcels with same owner	RI	High	Medium Low	yes	limited opportunity
87	Burrows Bay	168	0.94	139	1.35	35	<i>See island table within results section for detail.</i>	RI	High	Medium High	no	limited opportunity
93	Miller / Dewey / Similk Bay	309	0.8	223	1.56	66	<i>See island table within results section for detail.</i>	RI	High	High	yes, restore	limited opportunity