CHAPTER 6 EAST WHIDBEY/CAMANO ISLAND SHORELINES

Chapter 6 discusses the marine shoreline reaches of east Whidbey Island and all shorelines of Camano Island, within Water Resource Inventory Area (WRIA) 6. Marine shorelines along East Whidbey have commonalities with Camano Island marine shorelines, as they are along generally protected waters of Puget Sound compared to the exposed shorelines of West Whidbey. This chapter covers 15 reaches numbered from north to south along the East Whidbey shoreline, and 12 reaches running clockwise around Camano Island beginning at the northeast end of the island (Table 6-1). In addition, a reach is included for three small islands located north of Whidbey in Deception Pass (Deception Pass Islands). Marine reaches have been established based upon methods outlined in Chapter 2. All shorelines inventoried in this chapter are "shorelines of statewide significance" (Puget Sound).

Shoreline erosion and deposition processes on the East Whidbey Island and Camano Island shorelines vary from relatively intact to "more" degraded, compared to other areas of Puget Sound. Although no large rivers are found within the county, this area is heavily influenced by both the Stillaguamish and Skagit River systems. The wetlands and tideflats associated with these deltas are important rearing areas for anadromous fish and, along with other tideflats like Port Susan, are also important to migratory waterfowl and shorebirds. These shores are characterized by lower wave energy than west Whidbey as they are more sheltered from ocean conditions and have shorter fetch. Large harbors, embayments, and other variations in shoreline form divide this shoreline into 25 net shore-drift cells on Whidbey Island, and 12 net shore-drift cells on Camano Island (Keuler 1988, Johannessen 1992).

Similar to west Whidbey Island, the shores of East Whidbey and Camano Island consist of eroding bluffs that grade to low lying depositional shoreforms. Bluff erosion rates are heavily influenced by the combined effect of shore orientation and fetch as well as bluff stratigraphy and land use. South facing shores with considerable fetch are the most vulnerable to wave-induced erosion, while the most protected, lower energy shores are most often east or west facing shores within sheltered harbors and embayments. Large areas with negligible sediment in transport (No Appreciable Drift or NAD) are found on each island. This includes the bedrock shore along north Whidbey Island at Deception Pass and the complex of wetlands, sloughs, distributaries, mudflats, and dikes and levees associated with the Stillaguamish delta along the northeast shore of Camano Island, as well as several smaller areas. In these areas, erosion is a lower concern than elsewhere in the county.

East Whidbey Island and Camano Island includes the most densely populated shorelines in Island County, and more of the shoreline is armored than along the West Whidbey Island shoreline. Water quality is high enough that shellfish aquaculture is practiced in Penn Cove. There have, however, been shellfish harvest closures due to bacterial pollution or toxic algal blooms in Holmes Harbor, Penn Cove, Crescent Harbor, and Port Susan Bay. Areas at the northern and southern ends of Camano Island, as well as areas adjacent to East Whidbey's Saratoga Passage and Holmes Harbor shoreline, have the greatest problems with saltwater intrusion into wells.

Table 6-1. East Whidbey (EW) Island and Camano (CAM) Marine Reaches

Reach Label	Reach Description
Northeast Whidbey (Deception Pass to Polnell Point) (Section 6.1)	
Deception Pass Islands	Deception Pass Islands
EW1	Deception Pass State Park (From Deception Pass Bridge up to Cornet Bay)
EW2	Cornet Bay, Deception Pass State Park (From Cornet Bay Eastward)
EW3	Ala Spit
EW4	Dugualla Bay, Dugualla State Park, Mariner's Cove, Strawberry Point
EW5	Polnell Point
Oak Harbor and Penn Cove (Section 6.2)	
EW6	Scenic Heights
EW7	North Side Penn Cove
EW8	South Side Penn Cove (West of Coupeville)
EW9	South Side Penn Cove (East of Coupeville)
Saratoga Passage and Holmes Harbor (Section 6.3)	
EW10	Saratoga Passage North of Holmes Harbor, Harrington Lagoon, Race Lagoon, Pratts Bluff
EW11	Northeast Holmes Harbor, Dines Point, Honeymoon Bay
EW12	South Holmes Harbor, Freeland
EW13	NW Holmes Harbor, Baby Island Heights, Saratoga Passage South of Baby Island Heights
Possession Sound (Section 6.4)	
EW14	Southeast Whidbey Island (North Side of Langley, Possession Sound)
EW15	SW Whidbey Island (South of Langley to Clinton Ferry & Possession Point State Park)
Camano Island- Skagit / Stillaguamish Estuaries and Port Susan (Section 6.5)	
CAM1	Arrowhead Beach to Juniper Beach including English Boom Historical Park
CAM2	Livingston Bay
CAM3	Triangle Cove to Mountain View Road
CAM4	Mountain View Road to Tillicum Beach and Tyee Beach
CAM5	Tyee Beach to Camano Head
Camano Island- Saratoga Passage (Section 6.6)	
CAM6	Saratoga Passage from Camano Head to Summerland Drive
CAM7	Elger Bay and Saratoga Passage from Summerland Drive, Mabana
CAM8	Camano State Park and Cama Beach State Park
CAM9	Saratoga Passage from Cama Beach to Onamac Point
CAM10	Saratoga Passage from Onamac Point to Camano Island Yacht Club
CAM11	Camano Island Yacht Club to Utsalady Point Vista and Utsalady (West Side)
CAM12	Utsalady (East Side) to Brown Point

Reach Inventory Organization: The inventory refers to data collected from available sources and presented at a countywide scale in the Map Folio included as Appendix A. In this section, inventory information for each reach, is presented as a 'reach sheet' where pertinent reach characteristics are detailed and presented with a reach map (2009 aerial photography) and shoreline oblique photos (Ecology 2006). Reach inventory and characterization information is grouped in to four broad categories: 1) physical resources; 2) marine habitats and species; 3) shoreland habitats and species; and 4) shoreline use patterns. Information sources for the content included on each of the marine reach sheets are detailed in the Reach Sheet Guide, included in Chapter 5 preceding the reach sheets in Section 5.1.4. preceding the number two

In addition, key alterations and impairments and identified opportunities (restoration and otherwise) are identified within each reach sheet. Key alterations and impairments are summarized from existing data sources. Identified reach-specific restoration opportunities were identified by PSNERP Puget Sound Restoration Planning Activities, WRIA 6 Salmon Recovery Plan and during detailed assessment of existing marine shoretypes in 2005 (Coastal Geologic Services, 2005).

The reach scale assessment establishes a baseline of conditions along the West Whidbey shorelines that will be used to develop shoreline designations, and to revise policies and regulations, with the aim of achieving no net loss of shoreline functions. A summary of key opportunities and management issues for all West Whidbey reaches is included in Section 6.7.

6.1 Northeast Whidbey (Deception Pass to Polnell Point) Shorelines

Northeast Whidbey Island shorelines extend from Deception Pass clockwise around the Island to Whidbey Island Naval Air Station and the city limits of Oak Harbor (just east of Polnell Point). The Northeast Whidbey shorelines include Dugualla Bay as well as the east-facing shorelines abutting Skagit Bay.

6.1.1 Physical Characterization

The Northeast Whidbey shorelines are unique due to the proximity to Deception Pass and the strong tidal currents that flow through the area as well as the Skagit River delta. Maximum fetch is from the south, resulting in primarily northward net shore-drift. Southerly exposure is precluded by the north shore of Camano Island resulting in more moderate erosion rates. Common shoreforms include bluff backed beaches, barrier beaches and embayments as well as the only rocky shoretypes found within the County (excluding the small islands).

6.1.2 Biological Characterization

Northeast Whidbey Island marine shorelines include varied conditions that provide significant marine habitat to outmigrating anadromous salmonids, as well as numerous other fish and wildlife species. The Deception Pass shorelines (Deception Pass Islands reach, as well as EW01 and EW02 reaches) are generally rocky and bluff backed, with areas of bedrock shoreline; these areas support red sea urchin and Dungeness crab areas through mapped kelp and eelgrass areas. The generally east facing shorelines of Northeast Whidbey, including reaches EW03 and EW04, form the western edge of Skagit Bay. The opposite (mainland shoreline) of Skagit Bay consists

of the broad Skagit River estuary; migratory patterns of juvenile salmon extend out from the estuary, with the nearshore areas of Northeast Whidbey Island providing significant habitat. Extensive and ongoing research on juvenile salmon outmigration and nearshore use and rearing discusses the likely extent and use patterns along Island County's shorelines, including northeastern Whidbey Island shorelines (Luerkens, 2011; Beamer, 2007; Beamer et al, 2011, Beamer et al, 2006). In the 2006 report *Habitat and Fish Use of Pocket Estuaries in the Whidbey Basin and North Skagit County Bays, 2004 and 2005*, scientists from the Skagit River System Cooperative, the Stillaguamish Tribe, Tulalip Tribe, and other groups documented fish use, nearshore habitats, and habitat changes at a series of Island County sites.

A primary pathway of juvenile salmonid outmigration is Dugualla Bay; the bay is associated with Dugualla Lake, historically coastal marsh / lagoon area associated with the marine environment. Dugualla Lake is now cut off from tidal influence by fill and managed outlet (pump facility); however fish access is still documented into the lake area, with extensive associated stream and wetland habitat (see Dugualla Lake reach sheet in Chapter 7). Restoration of Dugualla Bay and of tidal influence to Dugualla Lake is identified as a priority for this area (PSNERP, 2010).

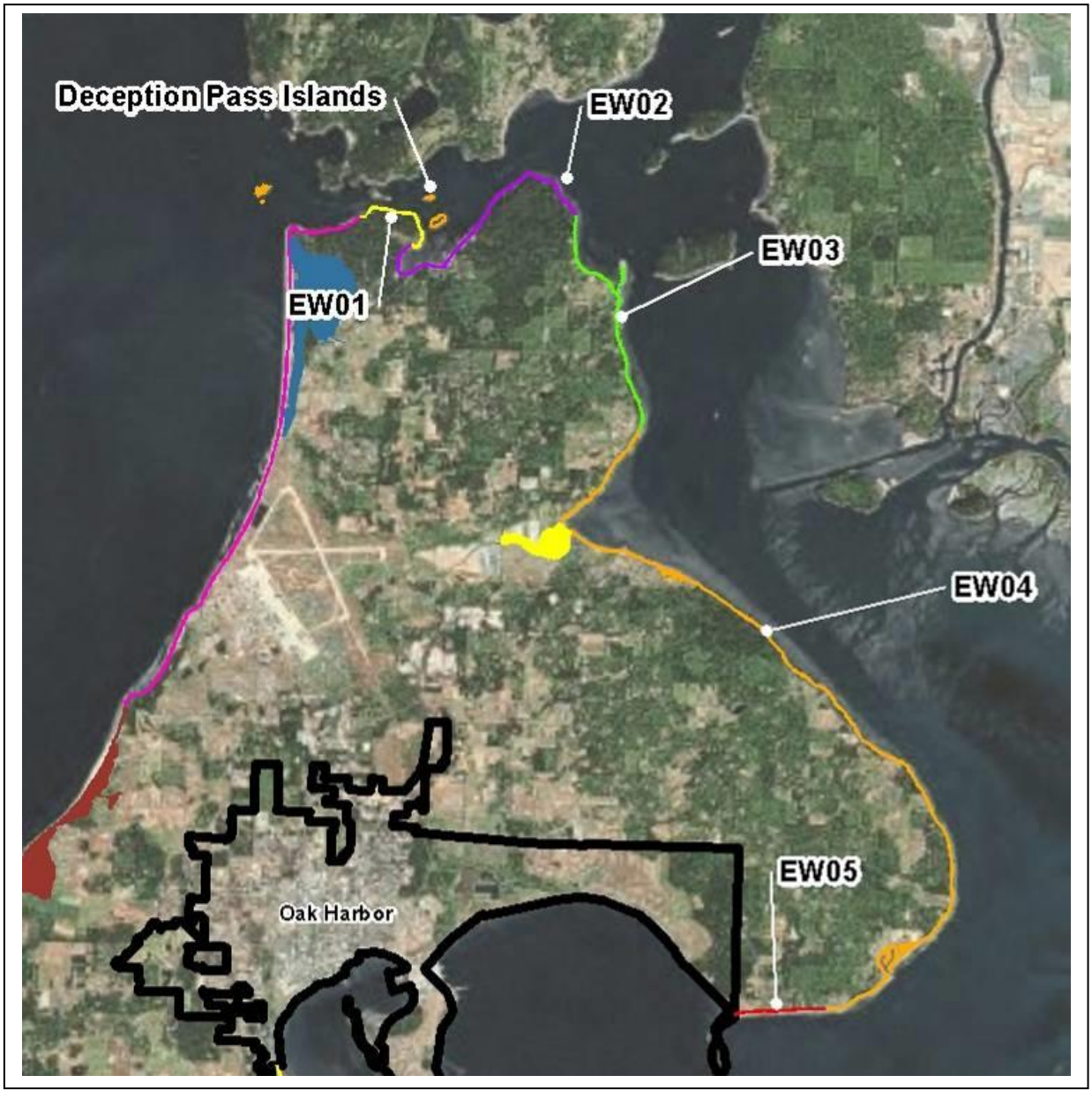
6.1.3 Shoreline Use Patterns

Northeast Whidbey Island shoreline areas consist predominantly of park areas (Deception Pass State Park; Ala Spit County Park; Dugualla State Park), rural development (generally 2 – 5 acres per lot), and focused areas of smaller lot rural residential development (1/4 – 1 acre lot sizes typical). One of the areas of dense residential development occurs in the Mariner's Cove community within Reach EW04; a narrow, Y-shaped boat channel provides protected moorage to residential properties within the community. Most other areas of rural development are located further away from the shoreline, set back behind coastal bluffs.

6.1.4 Reach Analysis

This section includes reach summaries (as reach information sheets) for East Whidbey Island's northeast marine shorelines, as depicted in Figure 6-1.

Figure 6-1. Northeast Whidbey marine reaches.



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6.2 East Whidbey – Oak Harbor and Penn Cove Shorelines

The Oak Harbor and Penn Cove shorelines extend from the Oak Harbor city limits near Blowers Bluff, along the entire Penn Cove shoreline (except for the incorporate Coupeville area along the south shore) to the southeast corner of the cove near Long Point.

6.2.1 Physical Characterization

The Oak Harbor and Penn Cove shorelines of Whidbey Island are some of the more complex, protected shores of Whidbey Island. Shore orientation is variable resulting in more complex patterns of net shore-drift. Penn Cove is far more protected than Oak Harbor, but areas consist of bluff backed beaches with intermittent embayments of variable size.

6.2.2 Biological Characterization

The entirety of Penn Cove is documented as an Important Bird Area by the Audubon Society of Washington. There designation states:

Penn Cove includes eight subtidal aquatic beds, including eelgrass, and supports a rich population of benthic invertebrates, including extensive mussel beds and numerous clam species. The cove's main importance is as a winter foraging area for aquatic birds. The site supports an assemblage of species associated with marine foraging areas, including 26 species of ducks, loons, and grebes. The area is used by wintering Black Turnstones, feeding and resting Surfbirds, Peregrine Falcons, Merlins, nesting Bald Eagles, and nesting Great Blue Herons. In some years, Black Turnstone counts have been the highest of all the U.S. Christmas bird counts. (Cullinan, 2001)

In addition to this Cove-wide designation, the shorelines include several coastal lagoons presumed to be providing habitat to juvenile salmonids. The shoreline also support forage fish and hardshell clam habitat. Penn Cove is a well known commercial shellfish growing area, primarily for muscles as well as oysters and hardshell clams.

6.2.3 Shoreline Use Patterns

The Oak Harbor and Penn Cove shorelines are primarily rural and rural residential (zoning designations); in rural areas, single-family houses interspersed with pastures. Roadways (Penn Cove Road, SR 20, and Madrona Way) parallel much of the shoreline in this reach.

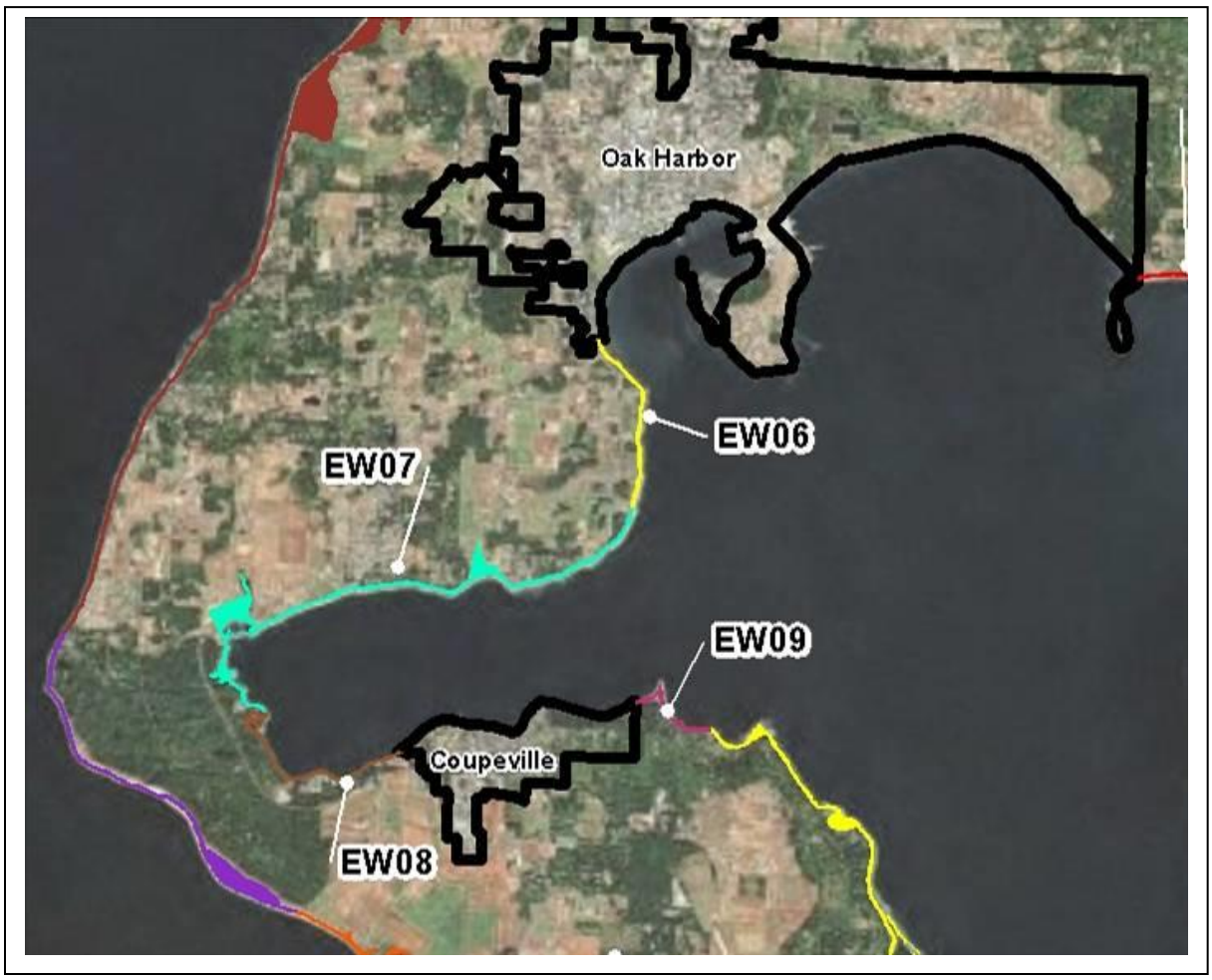
Residences are located on both low-lying areas near the shore, and atop steep bluffs. Riparian conditions are less altered in areas behind coastal bluffs than those areas with low-bank residential development.

The City of Coupeville extends along the southern shoreline of Penn Cove for approximately 2.5 miles.

6.2.4 Reach Analysis

This section includes reach summaries (as reach information sheets) for East Whidbey Island's Oak Harbor and Penn Cove marine shorelines, as depicted in Figure 6-2.

Figure 6-2. Oak Harbor and Penn Cove marine reaches.



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6.3 East Whidbey – Saratoga Passage and Holmes Harbor Shorelines

The Saratoga Passage and Holmes Harbor shorelines extend from Snakelum Point at the mouth (southeast corner) of Penn Cove generally south and southeast along the Saratoga Passage shoreline (EW10 and EW13), as well as through the entire shoreline of Holmes Harbor (EW11 – EW13). The community of Freeland, at the south end of Holmes Harbor, is included in the reach.

6.3.1 Physical Characterization

The Saratoga Passage and Holmes Harbor shorelines of Whidbey Island have moderate exposure, which is largely dependent on shore orientation. Similar to the rest of the rest of Whidbey these shores are comprised predominantly of bluff backed beaches, barrier beaches and various embayment shoreforms. Key physical processes include a relatively long net shore drift cell with northward drift. Many bluff backed beaches throughout this area are feeder bluffs that supply sediment to down drift barrier beaches. A short drift cell, measuring just over a mile, is located at the north end of this reach from Rodena Beach to Snakelum Point. This drift cell is likely the most exposed portion of the area with exposure to Skagit Bay. Glacial till overlying glacial outwash and drift dominates the bluffs in the southern end of this reach and transitions to glaciomarine drift to the north.

6.3.2 Biological Characterization

Several coastal lagoons are located in the reach (Harrington Lagoon at the north end, Race Lagoon, and several additional lagoons further south into Holmes Harbor). All coastal lagoons appear to receive tidal influence; however, all are partially modified by adjacent residential development. Over two dozen mouths drain along the marine shoreline, however only Maxwelton Creek is documented as supporting coho salmon and cutthroat trout (unnamed stream along the Saratoga Passage shoreline between Holmes Harbor and Penn Cove – mouth near N Bluff Road / Houston Road intersection).

WDFW maps all of the Holmes Harbor marine aquatic area as an estuary; marine areas provide forage fish and pandalid shrimp habitat, including contiguous eelgrass habitat. Juvenile salmon rearing and migration is presumed in the nearshore, including associated coastal lagoon areas.

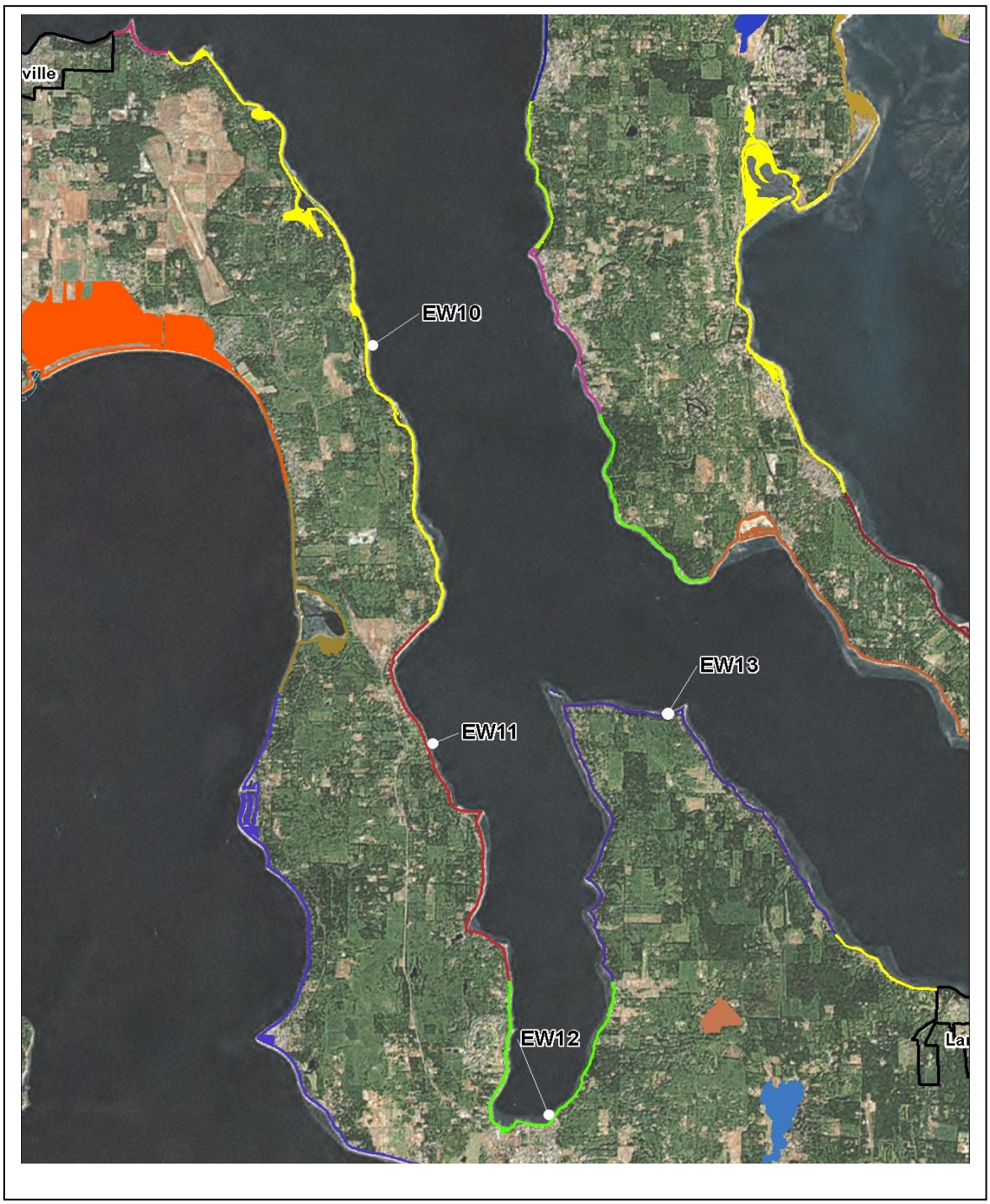
6.3.3 Shoreline Use Patterns

Saratoga Passage and Holmes Harbor shorelines are primarily rural and rural residential. Development ranges from widely-spaced houses on forested lots set back from the shoreline, to houses on small lots near the beach, such as at Snakelum Point, Harrington Lagoon, Race Lagoon, and along Hidden Beach Drive. Higher levels of shoreline armoring occur in low-bank areas than bluff backed beach reaches.

6.3.4 Reach Analysis

This section includes reach summaries (as reach information sheets) for East Whidbey Island's Saratoga Passage and Holmes Harbor marine shorelines, as depicted in Figure 6-3.

Figure 6-3. Saratoga Passage and Holmes Harbor marine reaches.



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6.4 East Whidbey – Possession Sound Shorelines

The Possession Sound shoreline extends from the marine reach immediately northwest of Langley (EW14) southeast and south through the entire extent of Whidbey Island's east facing Possession Sound shoreline (EW15). The area includes the incorporated City of Langley (areas not included in this inventory) and Clinton, an unincorporated community.

6.4.1 Physical Characterization

The Possession Sound shorelines of Whidbey Island are predominantly comprised of bluff backed beaches with fewer areas of barrier beaches. The greatest exposure is found along the southeast shore across Possession Sound from the Snohomish River delta with less exposure to the north along Saratoga Passage on the northeast facing side of this reach. Drift on the southern end of this reach is northward and drift on the north end of this reach is southward resulting in a barrier beach created at Sandy Point. The bluffs in this reach are dominated by a mixture of till and glacial outwash overlying glacial drift.

6.4.2 Biological Characterization

East Whidbey marine shorelines along Possession Sound provide juvenile rearing habitat for Chinook salmon, other anadromous salmonids, as well as numerous other species. The shoreline is comprised primarily of bluff backed beaches and barrier beaches, with less coastal lagoon or associated wetland area than other marine shorelines of Whidbey Island. Several coastal lagoons do occur on the shoreline; however they make up less than 1% of total shoreline area within the two reaches.

Numerous short, coastal drainages flow to the marine shorelines; however none support documented salmon use. Aquatic areas and associated shorelines provide habitat for waterfowl, forage fish, Dungeness crab, hard shell clams, pandalid shrimp, and gray whale (seasonal feeding habitat), as well as bald eagle nesting sites.

6.4.3 Shoreline Use Patterns

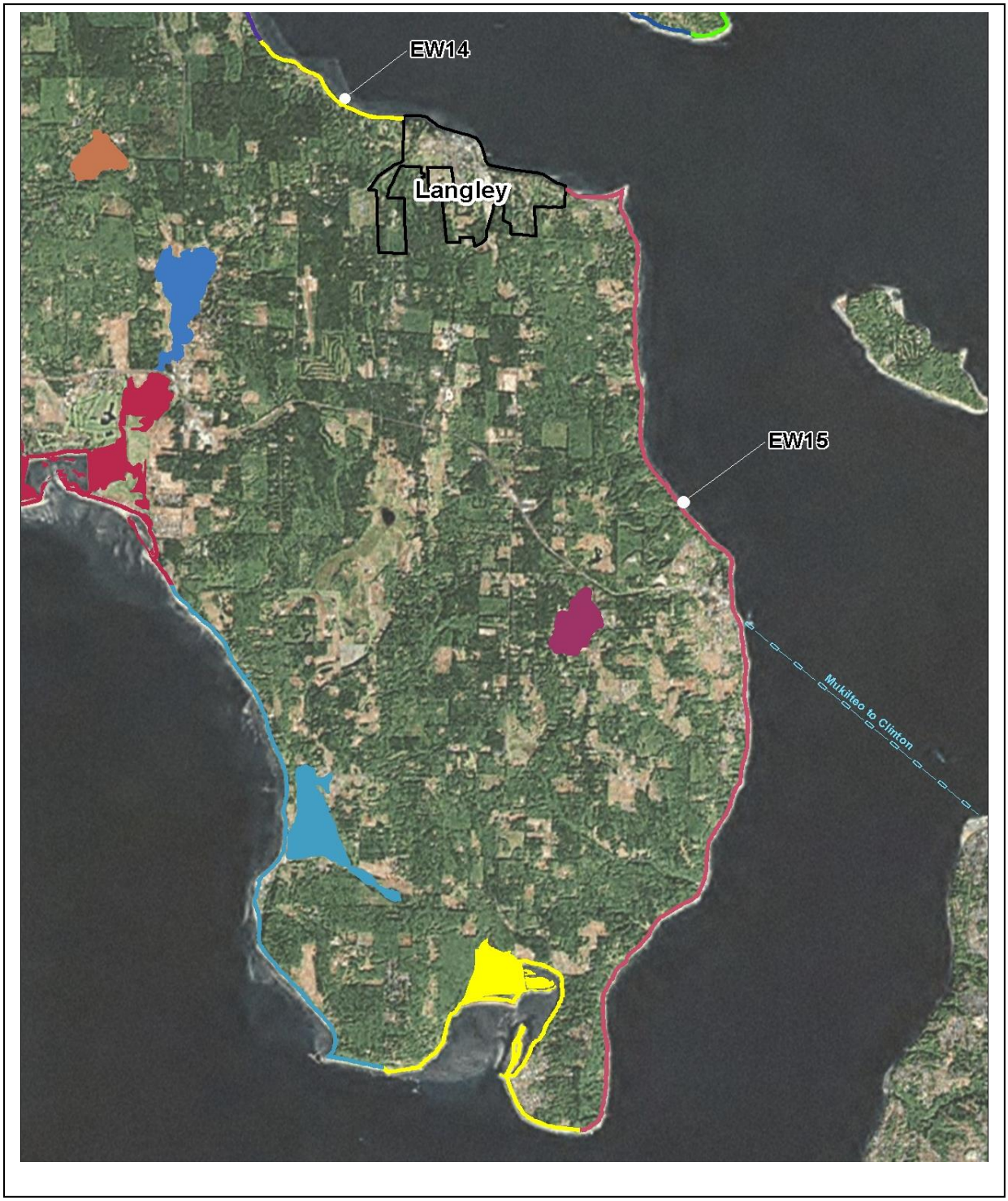
The Possession Sound shoreline areas largely support rural uses, with residences both atop and at the toe of steep bluffs. Areas of low-bank (bluff fronting) residential development with smaller lot sizes are focused in several small areas – including Sandy Point at the north end of EW15, as well as shorelines extending north (for approximately 1.6 miles) and south (for approximately 1 mile) from the Clinton Ferry terminal. Bluff fronting residential development occurs predominantly on relatively small lots (approximately 1/6 to 1/3 acre of an acre in size), with hard shoreline armoring common in these areas. Rural development occurring behind bluffs extends across larger lots (5 to 10 acres or greater).

Public access is provided to the shoreline adjacent to the ferry terminal, one of the largest overwater structures along the entire Whidbey Island shoreline. An additional park area is located at Possession Point, the southern tip of the Island, and numerous other public access opportunities are provide (although no access is provided north of the Clinton ferry terminal).

6.4.4 Reach Analysis

This section includes reach summaries (as reach information sheets) for East Whidbey Island's Possession Sound marine shorelines, as depicted in Figure 6-4.

Figure 6-4. Possession Sound marine reaches along the southeast shorelines of Whidbey Island.



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6.5 Camano Island – Skagit / Stillaguamish Estuaries and Port Susan Shorelines

The Camano Island marine shorelines included in this section extend along the entire generally east-facing shoreline of the Island. The northeastern shorelines (CAM01 and CAM02) include areas flanking the Skagit and Stillaguamish Estuaries, with the only public (vehicular or ferry) access provided to the Island from the mainland via State Route 532 (crossing the agricultural and estuarine areas and Davis Slough). The Camano marine shorelines discussed in this section extend south along the Port Susan shoreline to Camano Head (CAM05).

6.5.1 Physical Characterization

The Skagit / Stillaguamish Estuaries and Port Susan shorelines of Camano Island are predominantly comprised of delta with bluff backed beaches and barrier beaches farther to the north and south of the delta influence. Key physical processes are dominated by the influence of the river deltas and two relatively short drift cells on the north and south ends of the area. The southern drift cell is located east of Livingston Bay and exhibits eastward drift toward the delta. The north drift cell is located east of Brown Point on the northern tip of Camano Island and also exhibits eastward drift. The bluffs in the southern drift cell are comprised of sandy glacial outwash with a till and glaciomarine drift overlying. Bluff-derived sediment supplies down-drift barrier beaches adjacent to the delta. The northern drift cell has a similar lithology with till overlying sandy glacial outwash.

6.5.2 Biological Characterization

The Camano Island marine shorelines of Skagit Bay and Port Susan generally face east, facing two significant estuaries draining mainland Skagit County and Snohomish County. The Skagit River estuary drains to Skagit Bay, where the northeastern shorelines of Camano Island (CAM03) flank the estuarine area. The Stillaguamish River drains to the north end of Port Susan, with the estuary extending to the shoreline areas east of Livingston Bay (CAM02). The eastern Camano shorelines importance for outmigrating and rearing juvenile salmonids, including anadromous bull trout populations, is significant due to the proximity of both estuary areas.

Delta estuary wetlands and coastal lagoons occur along the shoreline, with delta wetlands focused around the northeast portion of the Island (extending between and linking Skagit and Stillaguamish estuaries). Significant portions of estuary wetland areas have been modified by agricultural land uses. Numerous short, coastal drainages flow to the marine shorelines; most do not support documented salmon use, although the stream draining to Triangle Cove from Kristoferson Lake does support salmonids, suggesting that the area provides significant juvenile rearing habitat.

Aquatic areas and associated shorelines additionally provide habitat for waterfowl, forage fish, Dungeness crab, harbor seals, and gray whale (seasonal feeding habitat), as well as bald eagle nesting sites.

6.5.3 Shoreline Use Patterns

Land use pattern along the eastern marine shorelines are varied between the northern (CAM01 and CAM02), central (CAM03 and CAM04), and southern (CAM05) extents. The northern shoreline use pattern includes extensive agricultural area intermixed with large-lot (5 to 10 acre) rural development. Agricultural uses are most prevalent in areas flanking the Skagit and Stillaguamish Estuaries, as well as areas along Livingston Bay. Two communities of dense (approximately 1/4 acre lots) shoreline residential development are also located along the Port Susan (Juniper Beach community) and Livingston shorelines.

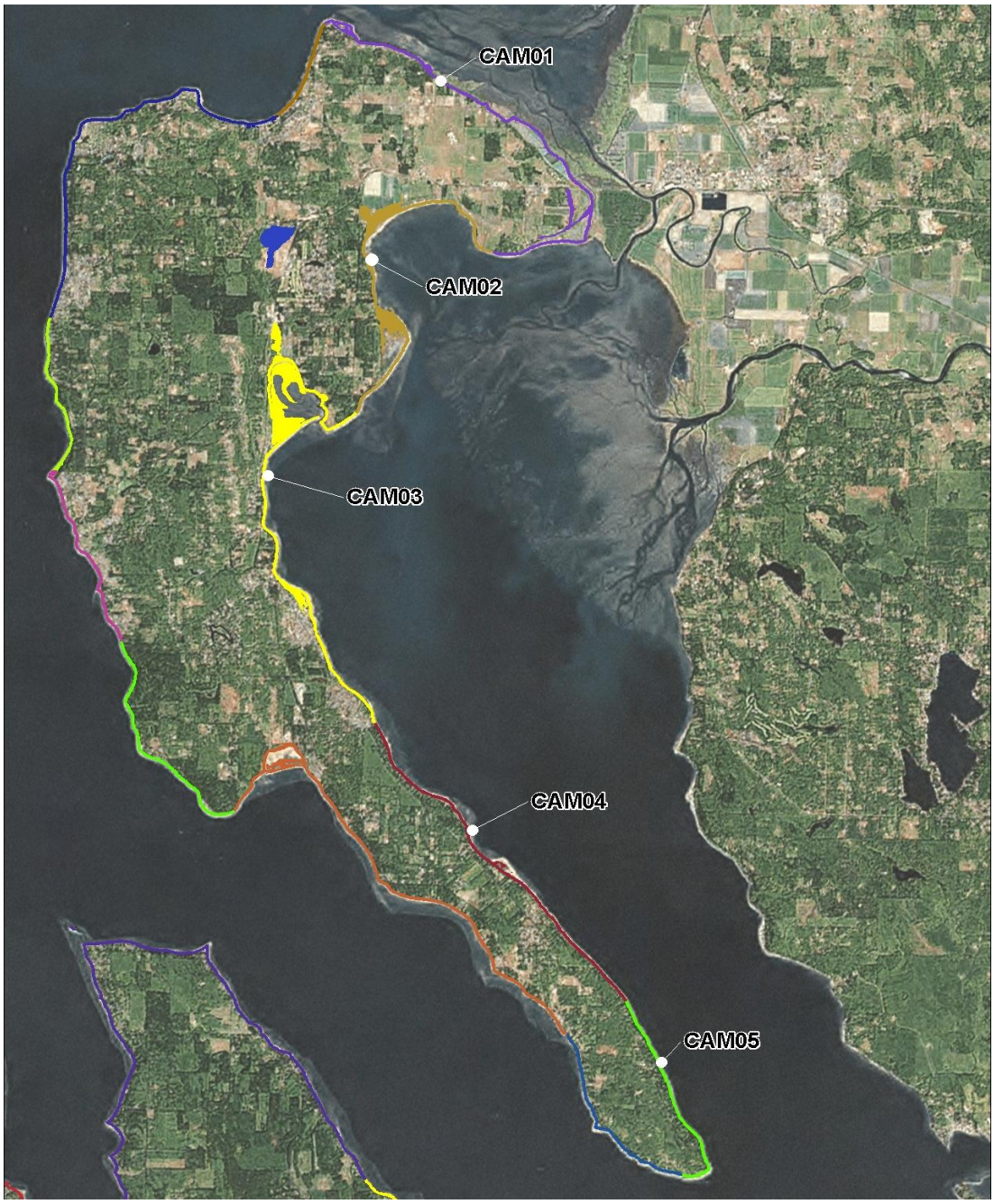
The central portions of Camano's east-facing marine shoreline are more intensely developed, with higher density shoreline residential development occurring both behind and fronting bluffs. Bluff fronting (low bank) residential development occurs within several disconnected communities, including fronting Triangle Cove, around the Camano Country Club, and Tillicum Beach area (where a boat ramp provides public access); lot sizes in these areas generally range from 1/6 to1/4 acre in area, with some lots even smaller. Hard shoreline armoring in bluff fronting communities is common. Residential development occurring behind bluffs generally occurs on larger lots, ranging from 1/3 to over an acre in size (depending on area). Residential development occurring behind bluffs in this middle segment generally includes significant clearing of forested vegetation landward of steep slope areas.

The southern portion of Camano's east facing shoreline (extending along Port Susan to and around Camano Head) is far less developed, with no bluff fronting residential development. Rural development occurring behind coastal bluffs occurs on larger (5 acres or more) lots, with forest communities remaining intact compared to the middle segment.

6.5.4 Reach Analysis

This section includes reach summaries (as reach information sheets) for the Skagit / Stillaguamish Estuaries and Port Susan marine shorelines of Camano Island, as depicted in Figure 6-5.

Figure 6-5. Skagit / Stillaguamish Estuaries and Port Susan marine reaches of Camano Island.



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6.6 Camano Island – Saratoga Passage Shorelines of Camano Island

This section includes the west facing shorelines of Camano Island, which extend along Saratoga Passage from Camano Head to Point Brown.

6.6.1 Physical Characterization

The Saratoga Passage shorelines of Camano Island are predominantly comprised of bluff backed beaches. Exposure is greatest to the south along most of Saratoga Passage, with some lesser northern exposure. Northward net shore-drift predominates much of the area, resulting in bluff derived sediment feeding down-drift (northern) shores. Theses bluffs are primarily composed of glacial outwash gravels and sands overlying older drift and some glaciomarine drift with which numerous landslides have been mapped.

6.6.2 Biological Characterization

The Camano Island marine shorelines along Saratoga Passage provide juvenile rearing habitat for Chinook salmon, other anadromous salmonids, as well as numerous other species. The shoreline is comprised primarily of bluff backed beaches and barrier beaches, with less coastal lagoon or associated wetland area than Eastern Camano Island (and shorelines of Whidbey Island). Several coastal lagoons do occur on the shoreline, including the largest for the Island's Saratoga Passage shoreline along Elger Bay,

Numerous short, coastal drainages flow to the marine shorelines; most do not support documented salmon use, although the stream draining Carp Lake (mouth located at south end of reach CAM11) does support salmonids.

Aquatic areas and associated shorelines additionally provide habitat for waterfowl, forage fish, Dungeness crab, hard shell clams, pandalid shrimp, and gray whale (seasonal feeding habitat), as well as bald eagle nesting sites.

6.6.3 Shoreline Use Patterns

The west-facing shorelines of Camano Island have varied shoreline use patterns that are characterized in three segments.

Camano Head shoreline areas southeast of Elger Bay include primarily rural development with large residential lots and development occurring behind coastal bluffs (limited areas of bluff fronting small scale development– approximately 45 developed lots).

An area of dense residential development occurs along the east shoreline of Elger Bay, where low bank residential development commonly includes shoreline bulkheads. Agricultural uses occur to the north of the bay and the associated coastal lagoon.

To the northwest of the Elger Bay, shoreline use is dominated by Camano Island State Park and Cama Beach State Park.

To the north of Cama Beach State Park, dense single-family residential development occurs throughout the shoreline area extending almost interrupted to the Utsalady community at the north end of the Island. For approximately 1.8 miles north of Onamac Point shoreline uses are rural, with significant intact forest remaining adjacent to the shoreline and through steep slope and bluff areas (CAM10).

Extensive public access is provided by the state parks (CAM08), with additional access points intermittently along the majority of the shoreline. No access is mapped at Elger Bay or to the south through Camano Head.

6.6.4 Reach Analysis

This section includes reach summaries (as reach information sheets) for Camano Island's Saratoga Passage marine shorelines, as depicted in Figure 6-6.

Figure 6-6. Saratoga Passage marine reaches of Camano Island.

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6.7 Summary of Opportunity Areas and Management Issues

6.7.1 Key Opportunity Areas

Restoration and preservation opportunities are highlighted at a reach level for all East and Camano Island marine shorelines in the preceding sections of this Chapter. Several opportunities areas are significant to preservation, restoration, and management of Island County's marine shorelines and shorelands.

- Preservation of marine shorelines with high-value coastal feeder bluffs and coastal lagoons.

    - Marine reaches with significant coastal feeder bluffs include EW04 and EW05 (Strawberry Point into Polnell Point), EW15 (shorelines along Possession Shores), CAM01 (Juniper Beach shoreline east of Livingston Bay), CAM05 and CAM06 (Camano Head), and CAM08 (along Camano Island State Park).

    - Coastal lagoons with significant preservation and restoration potential include: Dugualla Lake (EW04 and Dugualla Lake Reach; historically tidally influenced – currently managed as a freshwater system, however significant ongoing restoration planning); Grasser's Lagoon and Kennedy Lagoon (EW07 at the west end of Penn Cove), Harrington Lagoon and Race Lagoon (EW10 along Saratoga Passage); English Boom coastal lagoon and shoreline conservation (CAM01); Livingston Bay (CAM02); Triangle Cove (CAM03); and Elger Bay (CAM 07).

- Preservation and land use management focused on anticipated shoreline habitat shifts resultant from climate change and sea level rise. Opportunities include Port Susan and Skagit Bay, Dugualla Bay, Elger Bay, and other smaller estuarine and coastal lagoon marine habitats. Preservation in these areas will maintain important nearshore salmonid rearing habitats as well as bird habitats (these areas are documented shorebird and / or waterfowl concentration areas).

- Maintenance and/or improvement of water quality in areas with valuable shellfish and wildlife habitat, including Penn Cove and Holmes Harbor. These East Whidbey shorelines support substantial commercial and recreational shellfish (mussel, oyster, clam, as well as Dungeness crab) fisheries, however also support population centers with moderately intensive development and use adjacent shorelands.

- Preservation of key habitats for juvenile salmon outmigration and nearshore rearing. Preservation should be focused throughout areas surrounding the Skagit and Stillaguamish estuaries, including English Boom, Livingston Bay, Triangle Cove, Ala Spit, Strawberry Point, and Dugualla Bay.

6.7.2 Management Recommendations

Based upon this inventory and characterization, several preliminary management recommendations have been developed for the East Whidbey and Camano Island shorelines.

These broad recommendations apply to future management decisions for marine shorelines of the state in the County including the development of shoreline environment designations, goals and policies, and shoreline regulations. Management recommendations for East Whidbey include:

- Marine shorelines with high-value coastal feeder bluffs, coastal lagoons, and mature riparian habitat should be preserved in a largely unaltered condition and considered for a protective (Natural or Rural Conservancy) designation; preservation of these currently largely unaltered areas will preserve existing habitat functions, including habitat supporting ESA listed salmonids and state designated priority species. Specific areas that should be considered for protection of ecological function include areas adjoining the Skagit and Stillaguamish Estuaries, Triangle Cove, areas around Camano Head, and State Park Lands.

- Continue to partner with the Tulalip Tribes, the Swinomish Tribe, neighboring counties, and other stakeholders to restore coastal wetlands and estuarine habitat at Triangle Cove, Elger Bay, and at estuarine area surrounding the northeast end of the Island;

- New development proposals should be required to provide an analysis of impacts to shoreline ecological functions during permit review;

- Water pollution should be prevented at its source (PSP, 2008). In areas of denser residential development and higher roadway density (including the northwestern and northern shorelines of the Island, as well as areas extending south from Triangle Cove along the Port Susan shoreline), consider incentives to retrofit existing stormwater management facilities to improve water quality and consider requiring low impact development strategies or higher levels of water quality improvement for new development;

- In order to avoid further degradation of natural erosion and accretion, limit new shoreline stabilization and require soft-shore armoring techniques where new armoring or retrofits cannot be avoided;

- Consider development standards to protect forage fish spawning areas and eelgrass beds within the marine nearshore;

- Consider standards to prevent the introduction of non-native invasive species and facilitate their rapid eradication; and

- Build an implementation, monitoring and adaptive management plan at the County level in order to track changes in the shoreline jurisdiction and determine successes, failures and corrective actions (PSP, 2008).