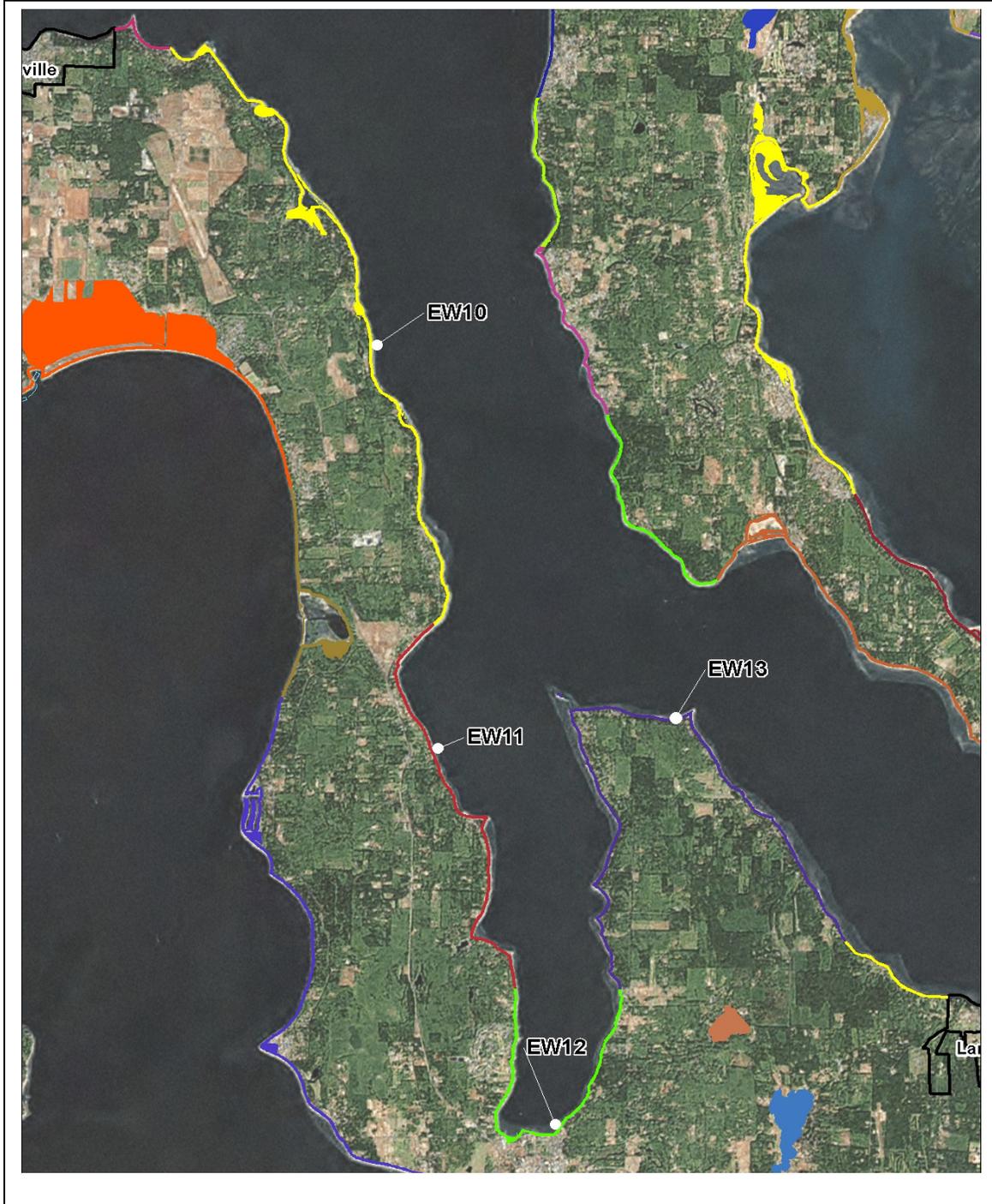


6.3.4 Reach Analysis

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.





REACH EW10

Saratoga Passage North of Holmes Harbor, Harrington Lagoon, Race Lagoon, Pratts Bluff

SHORELINE LENGTH:

12.05 Miles

REACH AREA:

320 Acres

PSNERP PROCESS UNITS:

6011 - 6013

REACH SUMMARY

Reach EW10 encompasses the western shore of Saratoga Passage along Whidbey Island. Geomorphic shoreline processes are influenced by a long, northern drift cell ending at Harrington Lagoon at the north end of the reach. Shoretypes alternate between feeder bluffs, transport zones and accretion shoreforms (primarily barrier beach).

Several coastal lagoons are located in the northern portion of the reach (Harrington Lagoon at the north end of the reach as shown in Oblique Photo A, Race Lagoon and an additional two lagoons further south). All coastal lagoons appear to receive tidal influence; however, all are partially modified by adjacent residential development. Four stream mouths are mapped along the marine shoreline, including one that supports Coho salmon and cutthroat trout. Cliffs and Bald Eagle habit territories are mapped by WDFW extensively along the shoreline.

This reach is largely 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.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

Feeder Bluff (28%), Accretion Shoreform (24%), No Appreciable Drift (21%), Transport Zone (20%), Modified shoreline (5%), and Feeder Bluff Exceptional (2%) along north-trending drift cell

Net Shore Drift (Map 8)

This reach encompasses the middle and terminus of a long drift cell with northward drift extends from south of Honeymoon Bay and converges with a short cell with westward drift at Snakelum Point.

Shoreform Current (Map 10)

Primarily Bluff-backed Beach (58%); three areas of Barrier Beach (22%) in areas of accretion (Barrier Beaches front Harrington Lagoon, Race Lagoon, and Barrier Estuary areas within reach)

Overall Rating of Degradation

Least (100%)

Coastal Floodplain:

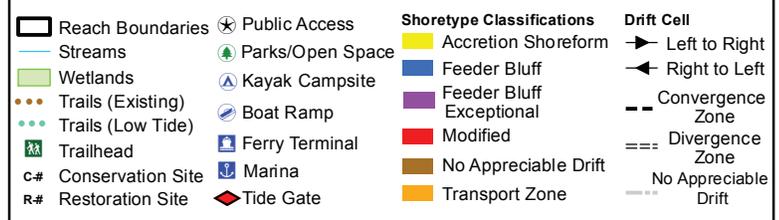
20%

Coastal Landslides & Toe Erosion:

Intermittent mapping of toe erosion, occasional landslide sites throughout reach.

Steep Slopes

34%



Shoreline Oblique Photos (2006)

HABITATS & SPECIES

Significant & Unique Features (Maps 5-7)

Hardshell clam habitat; geoduck habitat at south end of reach; continuous and patchy eelgrass; limited areas of kelp fronting Race and Harrington Lagoons. Three documented Pigeon Guillemot nesting colonies located at Harrington Lagoon North, Harrington Lagoon South, and Pratts Bluff.

Shoreland Priority Habitats & Species (Map 5)

Bald Eagle buffer; Cliff

Marine Priority Habitats & Species (Map 5)

Coastal lagoons

Salmonid Fish Use (Map 5)

Coastal cutthroat, coho in 1 stream; presence/migration for all. Nearshore areas are designated ESA critical habitat for Chinook (Puget Sound ESU) and bull trout.

Coastal Lagoons 13 acres (4%) **Coastal Stream Mouths** 4 **Wetlands (Map 4)** 27%

Forage Fish

Sandlance 3%

Smelt 10%

Herring Spawning nearshore at Harrington Lagoon; holding area offshore

LAND & SHORELINE USE

Shoreline Modifications (Map 13)

intermittent armoring inventoried along reach shoreline, including area extending south from race lagoon; largely unmodified.

Public Access (Map 16)

Mapped public tidelands lands near Harrington Lagoon and Race Lagoon; public tidelands accessible via watercraft only located in central portion of reach; public lands and adjoining private lands (with limited public access) located along Hidden Beach Dr; undeveloped County property along Race Rd ('Site GG'; < 1 acre, no existing access).

Armoring (% of shoreline) (Map 13) 6%

Zoning (Map 11)

Rural (62%); Rural Residential (38%)

Overwater Structures (Map 14)

Intermittent private overwater structures along reach; no major structures.

Current Land Use (Map 12)

Number of Parcels 476 **Average Parcel Size** 1.59 Acres

Rural residential development, areas of smaller-lot shoreline residential development.

Shellfish & Aquaculture (Map 15)

Primarily unclassified shellfish growing area; Closed shellfish beach fronting Race Lagoon, Approved growing area and beach along public tidelands in central reach (only accessible via watercraft).

KEY MANAGEMENT ISSUES

- Continued degradation of shoreline processes due to armoring (bulkheads).
- Disconnection of feeder bluff areas from shoreline due to toe armoring and / or development fronting bluff areas leading to greater down-drift erosion rates (issue is related to short portions of reach where development fronts coastal bluffs).
- Drinking water supply (aquifer) issues associated with additional development (subdivision / intensified use) — saltwater intrusion and potential exacerbation from sea level rise (SLR); northern portion of reach area mapped as 'Very-High Risk' for saltwater intrusion, other areas mapped as 'High Risk' (Island County Risk Rating Map).
- Slope stability, habitat and aesthetic implications of additional private shoreline access points on high bank shorelines (accessory to residential development).
- Management of shoreline steep slope areas extending outside of shoreline jurisdiction.
- Potential implications of SLR on coastal lagoons, estuarine areas, beaches and associated wetlands (loss of habitat) and on development within or near coastal floodplain areas (agricultural uses, shoreline residential development).
- Potential increases in coastal flooding and rates of bluff erosion due to SLR or other factors.
- Potential use conflicts associated with public access to beaches and private residential property rights.
- Slope / bluff stability for existing and future land uses at the top or toes of slopes (considering land uses and modifications such as clearing, creation of impervious surfaces, modified surface / groundwater dynamics).
- Subdivision and intensified use — additional modification of feeder bluff / steep slope areas and water quality implications (septic systems, road runoff and agriculture) due to greater intensity of use.

RESTORATION OPPORTUNITIES

Restoration sites were identified in 2004 by Coastal Geologic Services (Appendix H).

R30: Remove probable spartina patch.

R31: Restore tidal flow to saltmarsh (located south of Race Lagoon); assess tidal connectivity through existing road crossing.

CGS site R31 (as well as Site 9) are located at Race Lagoon.

Additional restoration opportunities identified at Harrington and Race Lagoons, both located at northern end of reach (see Island County Estuarine Restoration Program report).

CONSERVATION OPPORTUNITIES

C9: Preserve lagoon inlet and shores. Check for freshwater input and juvenile salmonoids.



REACH EW11

Northwest Holmes Harbor, Dines Point, Honeymoon Bay

SHORELINE LENGTH:

5.88 Miles

REACH AREA:

144 Acres

PSNERP PROCESS UNITS:

6010, 6011

REACH SUMMARY

Reach EW11 is located along the western shore of Holmes Harbor near the harbor mouth at Saratoga Passage. Geomorphic shoreline processes primarily driven by long north-trending cell beginning in Honeymoon Bay vicinity and continuing north into EW10. The reach shoreline is characterized by alternations between feeder bluffs, providing sediment and accretion shoreform areas (barrier beaches) receiving sediment, with scattered areas of shoreline armoring (modified shoreline) associated with residential development.

Limited areas of estuarine wetland are mapped along the reach, as well as areas of associated wetland (primarily at Honeymoon Bay / Honeymoon Lake — mapped as a large ponded wetland). WDFW maps all of the Holmes Harbor marine aquatic area as an estuary. Six short streams drain to the shoreline, including a salmon stream through Honeymoon Lake to Honeymoon Bay. Marine aquatic areas provide forage fish and pandalid shrimp habitat, including contiguous eelgrass habitat.

Land uses are a mix of closely spaced houses on narrow beach-front parcels, larger partly forested lots with houses set back from the shore and pasture / residential lawn areas. Dines Point and Honeymoon Bay are some of the more densely developed portions of the reach.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

Feeder Bluff (50%), Accretion Shoreform (26%), Modified shoreline (17%), and Transport Zone (8%) along north-trending drift cell

Net Shore Drift (Map 8)

This reach encompasses the origin of a long drift cell with northward drift from south of Honeymoon Bay.

Shoreform Current (Map 10)

Barrier Beach (28%); Bluff-backed Beach (72%)

Overall Rating of Degradation

Least (92%); Less (8%)

Coastal Floodplain:

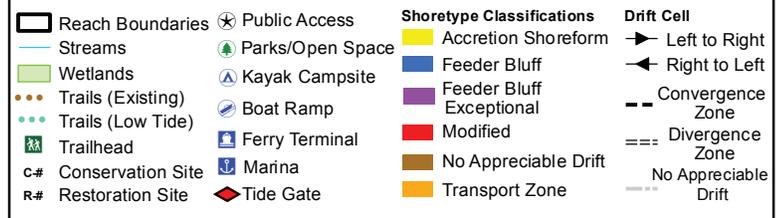
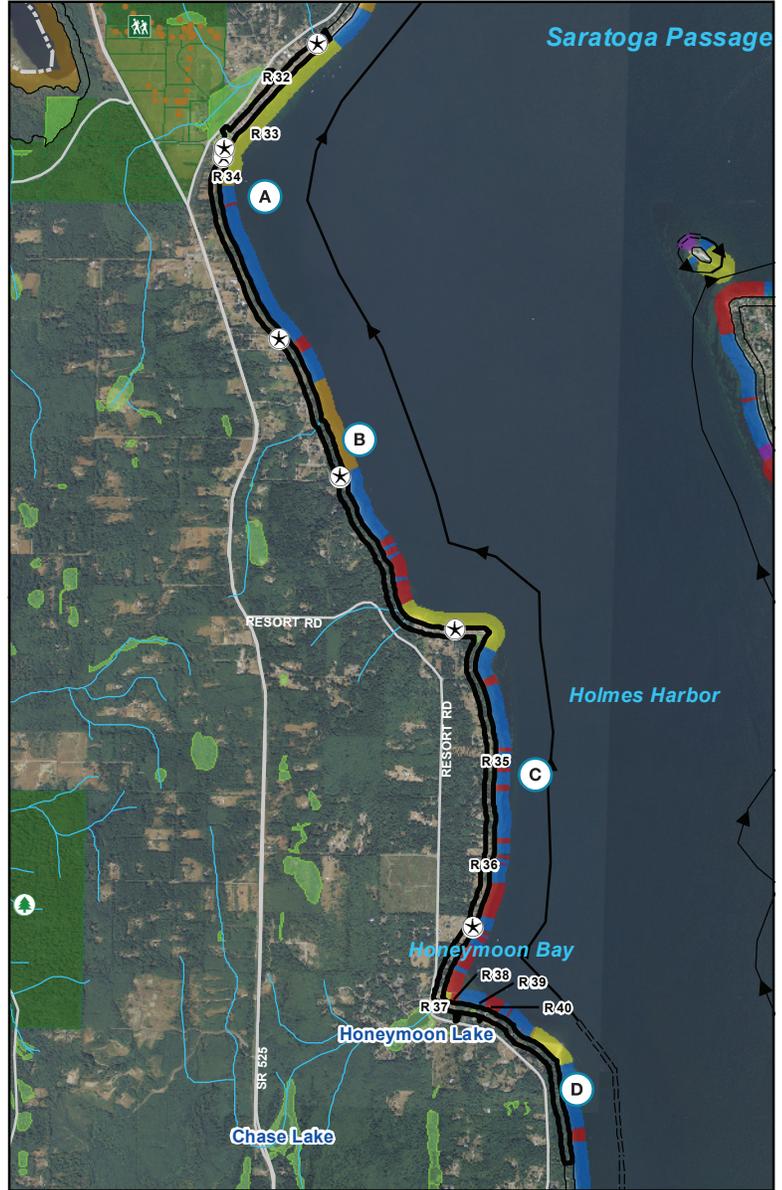
16%

Coastal Landslides & Toe Erosion:

Intermittent mapping of toe erosion, occasional landslide sites throughout reach.

Steep Slopes

34%



Shoreline Oblique Photos (2006)

HABITATS & SPECIES

Significant & Unique Features (Maps 5-7)

Pandalid shrimp habitat offshore; geoduck habitat along shoreline; continuous eelgrass.

Coastal Lagoons < 1 acre (< 1%)	Coastal Stream Mouths 6	Wetlands (Map 4) 1%
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Forage Fish

Sandlance 22%

Smelt 3%

Herring Spawning along shoreline; holding area offshore

LAND & SHORELINE USE

Shoreline Modifications (Map 13)

Armoring mapped primarily on shoreline from Dines Point to Honeymoon Lake area; all armoring in reach associated with shoreline residential development.

Armoring (% of shoreline) (Map 13) 10%

Zoning (Map 11)

Rural (75%); Rural Residential (25%)

Current Land Use (Map 12)

Number of Parcels 264 **Average Parcel Size** 1.64 Acres

Rural residential development, areas of smaller-lot shoreline residential development.

Shoreland Priority Habitats & Species (Map 5)

Bald Eagle buffer

Marine Priority Habitats & Species (Map 5)

Holmes Harbor mapped estuary

Salmonid Fish Use (Map 5)

Coastal cutthroat through Honeymoon Lake and Honeymoon Bay. Nearshore areas are designated ESA critical habitat for Chinook (Puget Sound ESU) and bull trout.

Public Access (Map 16)

No mapped public lands or public tidelands; limited visual access provided from adjacent roadways.

Overwater Structures (Map 14)

Community pier at Honeymoon Lake Community Club; several other private piers (no clustering and no significant structures).

Shellfish & Aquaculture (Map 15)

Approved shellfish growing area throughout reach; no mapped shellfish beaches.

KEY MANAGEMENT ISSUES

- Continued degradation of shoreline processes due to armoring (bulkheads).
- Disconnection of feeder bluff areas from shoreline due to toe armoring and / or development fronting bluff areas leading to greater down-drift erosion rates (issue is related to short portions of reach where development fronts coastal bluffs).
- Slope stability, habitat and aesthetic implications of additional private shoreline access points on high bank shorelines (accessory to residential development).
- Potential use conflicts associated with public access to beaches and private residential property rights.
- Slope / bluff stability for existing and future land uses at the top or toes of slopes, (considering land uses and modifications such as clearing, creation of impervious surfaces, modified surface / ground-water dynamics).
- Subdivision and intensified use — additional modification of feeder bluff / steep slope areas and water quality implications (septic systems, road runoff and agriculture) due to greater intensity of use.
- Potential implications of sea level rise (SLR) barrier beaches (loss of habitat).
- Potential increases in coastal flooding and rates of bluff erosion due to SLR or other factors.

RESTORATION OPPORTUNITIES

Restoration sites were identified in 2004 by Coastal Geologic Services (Appendix H).

- R32:** Re-create inlet and restore portions of partially filled coastal wetland.
- R33:** Removed failed bulkhead for upper intertidal and backshore restoration.
- R34:** Remove pilings and rock fill.
- R35:** Remove concrete and rock fill.
- R36:** Remove apparently unused development platform and surrounding rock armoring.
- R37:** Restore tidal connection to Honeymoon Lake at Honeymoon Bay; restoration would re-establish a coastal lagoon.
- R38:** Remove modification.
- R39:** Remove dilapidated boat house and railway ramp extending into intertidal area.
- R40:** Remove PVC sheet pile and creosote pile bulkhead walls; restore shoreline stabilization with soft armoring approach or identify opportunities for removal of fill and alterations extending into the intertidal area.



REACH EW12

South Holmes Harbor, Freeland

SHORELINE LENGTH:

4.95 Miles

REACH AREA:

123 Acres

PSNERP PROCESS UNITS:

6004, 6007-6010

REACH SUMMARY

Reach EW12 includes the south end of Holmes Harbor and the community of Freeland. Geomorphic shoreline processes include two small areas of convergence at the end of the harbor from south-trending cells on the west and east shorelines. The east and west shorelines of the Harbor are primarily feeder bluff and transport zone, with significance areas of modified (armored) shoreline. Accretion areas are focused in the shoreline fronting Freeland.

Limited areas of associated wetland are mapped within the shoreline planning area. WDFW maps all of the Holmes Harbor aquatic area as an estuary. Two short streams drain to the shoreline; neither are mapped as supporting salmonids. Marine aquatic areas provide forage fish, geoduck and pandalid shrimp habitat, including contiguous eelgrass habitat.

Development and shoreline modifications are most concentrated on the west and south portions of the harbor, while the east side has more forest and pasture areas. Shoreline uses include a golf course and beach club community, other residential development, a County public dock and boat ramp and a boat building company.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

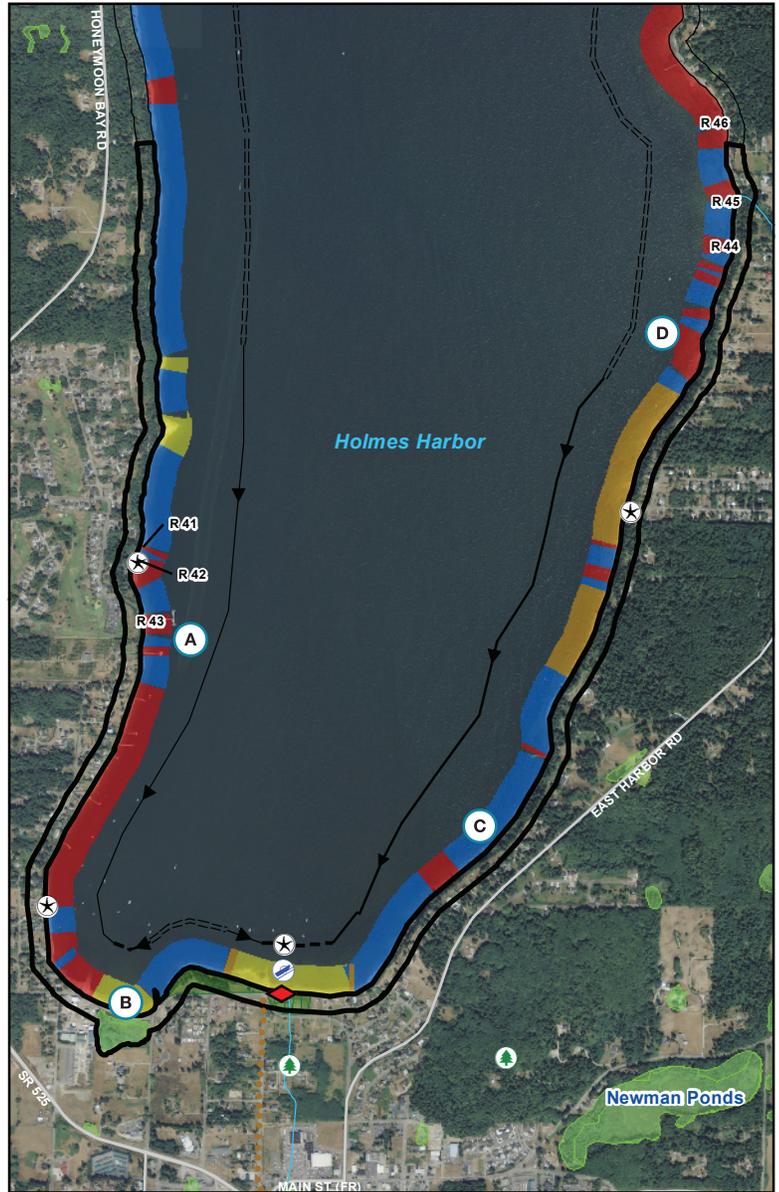
Feeder Bluff (50%), Modified shoreline (26%), Transport Zone (13%), and Accretion Shoreform (11%) along the Holmes Harbor shoreline

Net Shore Drift (Map 8)

Southward drift along both the western and eastern shores of Holmes Harbor converge with two smaller drift cells along west and east sides of head of Holmes Harbor, respectively. A small divergence zone separates the two smaller cells in the central bayhead of Holmes Harbor.

Shoreform Current (Map 10)

Bluff-backed Beach (97%)



Overall Rating of Degradation

Least (57%); Less (43%)

Coastal Floodplain:

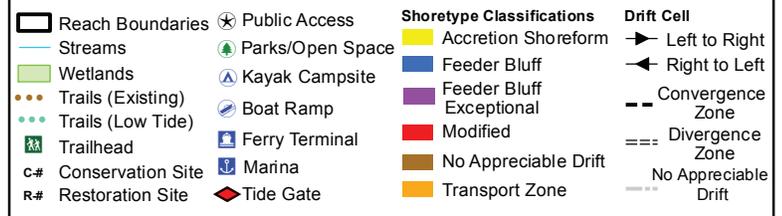
15%

Coastal Landslides & Toe Erosion:

Intermittent mapping of toe erosion, occasional landslide sites throughout reach.

Steep Slopes

32%



Shoreline Oblique Photos (2006)



REACH EW13

Northeast Holmes Harbor, Baby Island Heights, Saratoga Passage South of Baby Island Heights

SHORELINE LENGTH:

9.76 Miles

REACH AREA:

231 Acres

PSNERP PROCESS UNITS:

6003-6007

REACH SUMMARY

Reach EW 13 extends around a peninsula between Holmes Harbor and Saratoga Passage and includes shorelines fronting both marine areas. Geomorphic shoreline processes are characterized by two dominant drift cells: a cell trending out of Holmes Harbor and around Rocky Point converging at East Point with a cell trending north along the Saratoga Passage shoreline. The relatively long reach alternates between areas of feeder bluff, accretion and modification; the large majority of areas are mapped as bluff-backed beach.

There are no mapped associated wetlands or coastal lagoon areas within the reach shoreline planning area. WDFW maps all of the Holmes Harbor aquatic area as an estuary — this designation ends near Baby Point. Fourteen short streams drain to the shoreline within the reach, none supporting salmonids. Marine aquatic areas provide forage fish, geoduck, Dungeness crab (Saratoga Passage shoreline) and pandalid shrimp (Holmes Harbor area) habitat, including contiguous eelgrass habitat. Just offshore is Baby Island, a small undeveloped island used by harbor seals as a haulout site.

Rural residential development is characteristic of this reach. Residences are located both atop and at the toe of bluffs, with bluff-fronting development associated with shoreline armoring (primarily bulkheading). The community of Baby Island Heights is located at the northwest tip of the reach.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

Feeder Bluff (50%), Modified shoreline (23%), Accretion Shoreform (18%), Transport Zone (6%), and Feeder Bluff Exceptional (1%)

Net Shore Drift (Map 8)

One long drift cell with northward drift originates on the east side of Holmes Harbor south of Beverly Beach transitions to eastward drift at Rocky Point and terminates at East Point. Another cell with northward drift also terminates at East Point, resulting in the development of this cusped foreland converges with northward drift that originates south of Saratoga at East Point.

Shoreform Current (Map 10)

Bluff-backed Beach (84%)



Overall Rating of Degradation

Least (47%); Less (53%)

Coastal Floodplain:

26%

Coastal Landslides & Toe Erosion:

Extensive mapping of both along all feeder bluff areas (south and east of Rocky Point and south of East Point).

Steep Slopes

47%

Reach Boundaries	Public Access	Shoretype Classifications	Drift Cell
Streams	Parks/Open Space	Accretion Shoreform	Left to Right
Wetlands	Kayak Campsite	Feeder Bluff	Right to Left
Trails (Existing)	Boat Ramp	Feeder Bluff Exceptional	Convergence Zone
Trails (Low Tide)	Ferry Terminal	Modified	Divergence Zone
Trailhead	Marina	No Appreciable Drift	No Appreciable Drift
C# Conservation Site	Tide Gate	Transport Zone	
R# Restoration Site			



Shoreline Oblique Photos (2006)

