

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.





REACH CAM06

Camano Head North to Summerland Drive

SHORELINE LENGTH:

2.60 Miles

REACH AREA:

63 Acres

PSNERP PROCESS UNITS:

6044 - 6047

REACH SUMMARY

Camano Head North to Summerland Drive (Reach CAM06) is characterized by a largely unmodified shoreline area consisting of a 100- to 200-foot wide mixed forest riparian band through steep slope areas. Geomorphic shoreline processes are influenced by convergence of two drift cells at the center of the reach. There is a small barrier beach point fronting the steep slopes at the area of convergence.

Numerous short coastal streams drain to the shoreline within the reach, but none are mapped for salmon use. No inventoried wetlands or coastal lagoons are mapped. Aquatic areas provide habitat for forage fish (primarily smelt), pandalid shrimp, Dungeness crab and gray whale seasonal foraging.

Rural residential development (located along South Camano Drive) is generally setback 200 feet or more from the shoreline, behind steep slope areas. Limited low-bank residential development fronts the shoreline in this convergence area, along the point and to the south. Public tidelands are located near the north end of the reach, although no physical access opportunities are identified.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

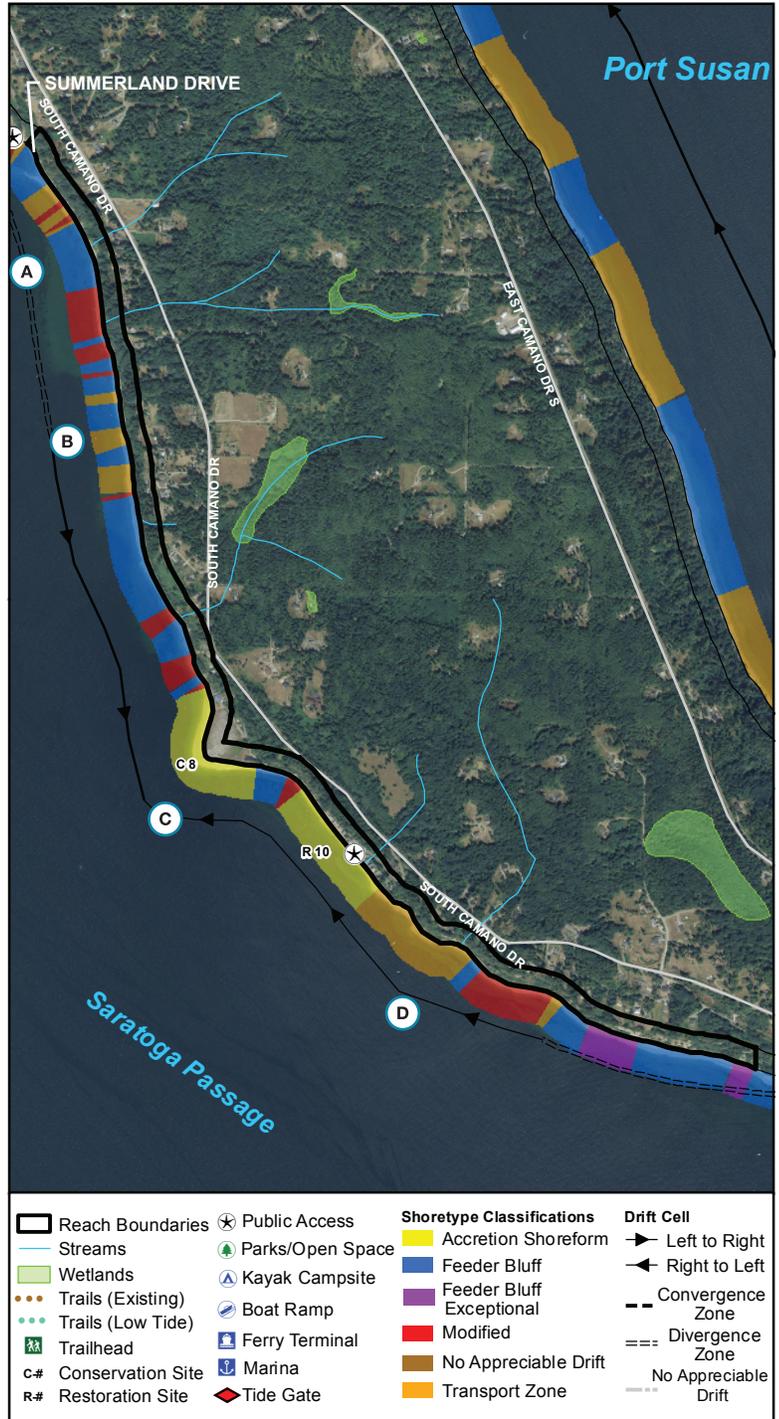
Feeder Bluff (46%), Modified shoreline (18%), and Transport Zone (17%) focused to one longer stretch of Accretion Shoreform (19%) at drift convergence

Net Shore Drift (Map 8)

Two drift cells converge at a barrier beach; one originates at Camano Head with northward drift and one originates approximately 1 mile north of Pebble Beach with southward drift.

Shoreform Current (Map 10)

Primarily Bluff-backed Beach (90%), Barrier Beach (10%) at drift convergence



Overall Rating of Degradation

Less (100%)

Coastal Floodplain:

10%

Coastal Landslides & Toe Erosion:

Toe erosion directly north of barrier beach.

Steep Slopes

60%



Shoreline Oblique Photos (2006)



REACH CAM07

Elger Bay and Saratoga Passage from Summerland Drive, Mabana

SHORELINE LENGTH:

7.64 Miles

REACH AREA:

190 Acres

PSNERP PROCESS UNITS:

6043 - 6046

REACH SUMMARY

Elger Bay and Saratoga Passage from Summerland Drive (Reach CAM07) is characterized by a largely unmodified shoreline area consisting of a 100- to 200-foot wide zone of coastal bluffs and steep slopes along Saratoga Passage. Bluff areas are steeper and generally less vegetated than steep slopes along CAM06 to south. Geomorphic shoreline processes are influenced by convergence of two drift cells at Elger Bay. There is a barrier beach along the Bay's north shoreline, with tidal connection at the west end to a coastal lagoon adjoining the bay (Oblique Photos A and B).

Two short coastal streams drain to the shoreline within the reach, however neither are mapped for use by salmon. A large coastal lagoon at Elger Bay, with associated wetlands, provides significant habitat. Aquatic areas provide mapped forage fish, pandalid shrimp, Dungeness crab, geoduck and gray whale seasonal feeding habitat.

Residential development occurs at rural to moderate densities and is generally set back 150 feet or more from the shoreline behind steep slope areas. Residential lots are commonly cleared up to the top of coastal bluffs. 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, immediately north of the associated coastal lagoon.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

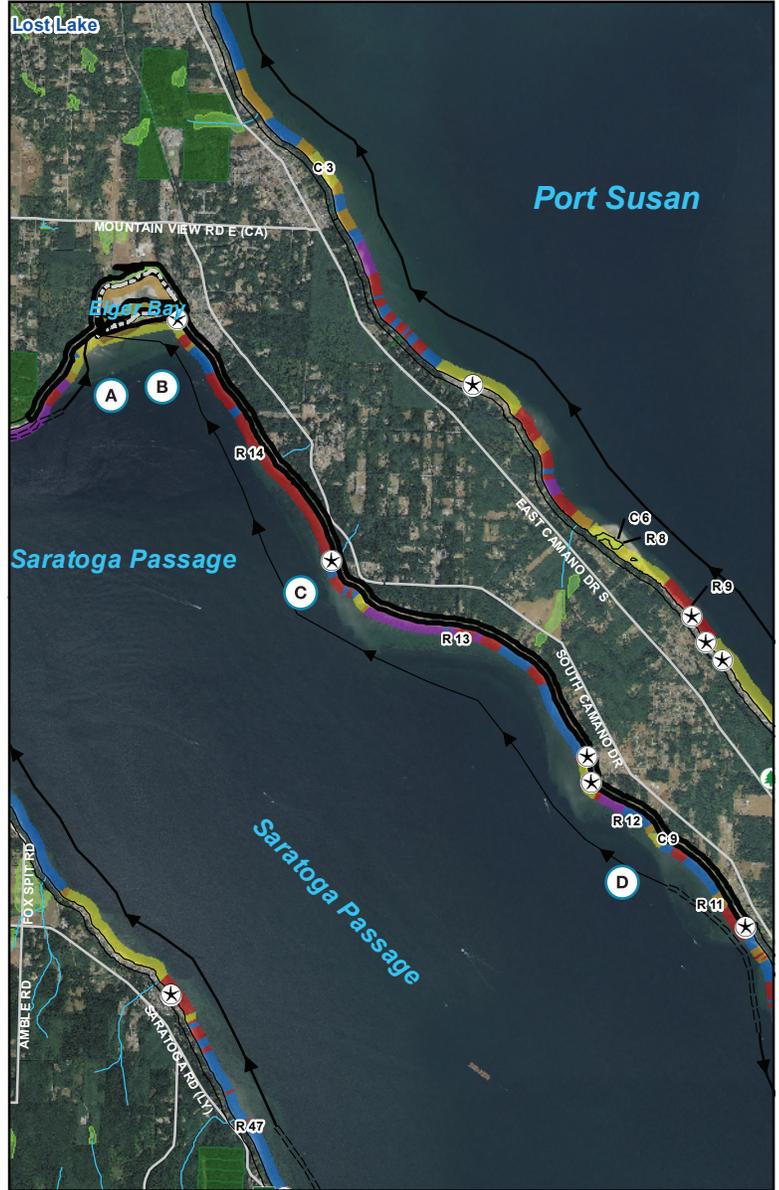
Feeder Bluff (34%), Modified shoreline (29%), and Transport Zone (3%) focused to one longer stretch of Accretion Shoreform (16%) fronting Elger Bay (at drift convergence); several shorter Accretion Shoreform areas mapped along southwest facing shoreline

Net Shore Drift (Map 8)

Northward net shore-drift converges with a shorter drift cell with northeastern drift at Elger Bay.

Shoreform Current (Map 10)

Primarily Bluff-backed Beach (73%), with Barrier Lagoon (18%), Barrier Beach (7%), and Artificial (2%) shoreforms focused around Elger Bay



Overall Rating of Degradation

Least (20%); Less (80%)

Coastal Floodplain:

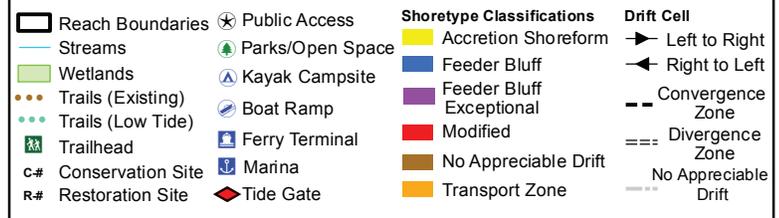
17%

Coastal Landslides & Toe Erosion:

Landslide in central portion of reach.

Steep Slopes

38%



Shoreline Oblique Photos (2006)

HABITATS & SPECIES

Significant & Unique Features (Maps 5-7)

Dungeness crab throughout Saratoga Passage; geoduck habitat at south end of reach; offshore pandalid shrimp habitat; continuous and patchy eelgrass; patchy kelp southeast and southwest of Elger Bay.

Shoreland Priority Habitats & Species (Map 5)

Bald Eagle (habitat buffers); Cliffs-Bluffs; Wetlands

Marine Priority Habitats & Species (Map 5)

Gray Whale habitat (majority of reach)

Salmonid Fish Use (Map 5)

Nearshore areas are designated ESA critical habitat for Chinook (Puget Sound ESU) and bull trout.

Coastal Lagoons 20 acres (11%) **Coastal Stream Mouths** 2 **Wetlands (Map 4)** 16%

Forage Fish

Sandlance 21%

Smelt 14%

Herring None mapped

LAND & SHORELINE USE

Shoreline Modifications (Map 13)

Armoring inventoried through majority of reach; highest intensity modification near and fronting Elger Bay.

Public Access (Map 16)

Northwest extent of reach within Camano Island State Park (primarily within CAM08).

Armoring (% of shoreline) (Map 13) 41%

Zoning (Map 11)

Rural (81%); Rural Residential (18%); Parks (1%)

Overwater Structures (Map 14)

3 private piers - all providing residential access through steep slope areas to shoreline; 1 pier at west end of reach (appears to be private).

Current Land Use (Map 12)

Number of Parcels 282 **Average Parcel Size** 2.36 Acres

Low density residential; high density area of shoreline development east and southeast of Elger Bay; (generally only one parcel deep) backed by bluffs and steep slopes extending into less intensely developed rural areas.

Shellfish & Aquaculture (Map 15)

Unclassified; no mapped or classified shellfish beaches.

KEY MANAGEMENT ISSUES

- Slope / bluff stability for existing and future land uses at the top or toes of coastal slopes, (considering land uses and modifications such as clearing, creation of impervious surfaces, modified surface / groundwater dynamics).
- 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).
- Subdivision — additional modification of feeder bluff / steep slope areas due to greater intensity of use.
- Potential increases in coastal flooding and rates of bluff erosion due to sea level rise (SLR) or other factors may affect shoreline residential development.
- Slope stability and aesthetic implications of additional private shoreline access points on high bank shorelines (accessory to residential development).
- Potential implications of SLR on Elger Bay lagoon, barrier beaches and associated wetlands (loss of habitat).
- Potential implications of SLR and coastal flooding on development within or near coastal floodplain areas (shoreline residential development around Elger Bay).
- Water quality issues associated with additional development (subdivision / intensified use) — including implications of septic systems and road runoff.
- Potential use conflicts associated with public access to beaches and private residential property rights.

RESTORATION OPPORTUNITIES

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

- R11:** Remove failed and failing pile bulkheads in upper intertidal area immediately north of large intertidal fill (south of Mabana).
- R12:** Remove failed pile bulkhead that extends into upper intertidal beach.
- R13:** Remove large upper intertidal pile bulkhead and associated alterations to intertidal area near “Camp Diana”; existing bulkhead contains 2 stairway landings and extends well into intertidal area.
- R14:** Remove pile bulkheads and restore associated alteration that extends over the intertidal beach.

Additional opportunity identified within Elger Bay by Island County Estuarine Restoration Program report (2001).

CONSERVATION OPPORTUNITIES

- C9:** Conserve beach and forested backshore and bank area along 450 ft accretion shoreform unit.



REACH CAM08

Camano State Park and Cama Beach State Park

SHORELINE LENGTH:

3.09 Miles

REACH AREA:

74 Acres

PSNERP PROCESS UNITS:

6042 - 6043

REACH SUMMARY

Reach CAM08 consists primarily of Camano Island State Park and Cama Beach State Park. Both large parks extend well inland from the shoreline area, though developed intensive active use areas are predominantly near the shoreline. Geomorphic shoreline processes are primarily influenced by a long north-trending drift cell extending from Lowell Point and continuing along the entire west shoreline of Camano Island.

A stream used by coastal cutthroat drains through Cama Beach State Park to the marine shoreline. No inventoried wetlands or coastal lagoons are mapped. Aquatic areas provide forage fish (primarily smelt), pandalid shrimp, Dungeness crab and gray whale seasonal feeding habitat.

Camano Island State Park includes a boat launch facility as well as significant shoreline access. Modifications to the shoreline are limited to areas around the launch facility. Cama Beach State Park is more intensely developed along the shoreline, a series of historic cabins and associated facilities extend along the parks western shoreline. A bulkhead extends throughout this area. There is also an area of low-bank residential development between the state parks. Residential use generally includes lawn areas extending to bulkheads, several lots have private boat launch facilities.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

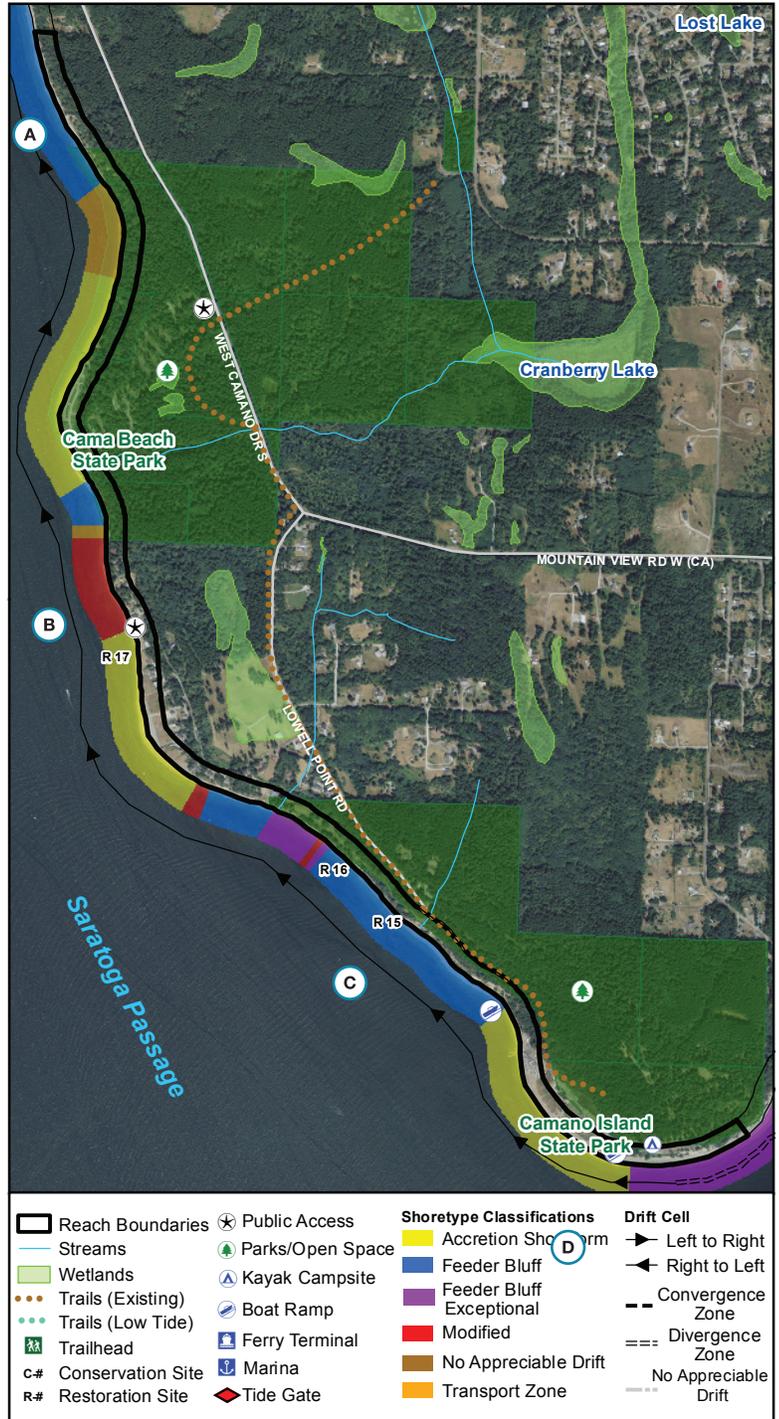
Primarily Feeder Bluff (45%), with significant Accretion Shoreform (40%) fronting Cama Beach State Park, Modified shoreline (8%) also mapped in State Park vicinity

Net Shore Drift (Map 8)

A long drift cell with northward net shore-drift occurs along most of the western shore of Camano Island, this reach encompasses the up-drift extent (origin) of that drift cell.

Shoreform Current (Map 10)

Primarily Bluff-backed Beach (87%); Barrier Beach (13%) at southern end of reach



Overall Rating of Degradation

Least (5%); Less (95%)

Coastal Floodplain:

32%

Coastal Landslides & Toe Erosion:

Intermittent toe erosion and landslides along northern extent.

Steep Slopes

43%



Shoreline Oblique Photos (2006)

HABITATS & SPECIES

Significant & Unique Features (Maps 5-7)

Dungeness crab through aquatic extent; geoduck habitat around Camano Island State Park shoreline; offshore pandalid shrimp habitat; continuous and patchy eelgrass; patchy kelp along Camano Island State Park shorelines.

Shoreland Priority Habitats & Species (Map 5)

Bald Eagle (habitat buffers); Cliffs-Bluffs; Wetlands

Marine Priority Habitats & Species (Map 5)

Gray Whale habitat (majority of reach)

Coastal Lagoons None mapped	Coastal Stream Mouths 3	Wetlands (Map 4) None mapped
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Forage Fish

Sandlance None mapped	Smelt 68%
Herring None mapped	

Salmonid Fish Use (Map 5)

Coastal cutthroat (presence/migration) in stream through Cama Beach State Park. Nearshore areas are designated ESA critical habitat for Chinook (Puget Sound ESU) and bull trout.

LAND & SHORELINE USE

Shoreline Modifications (Map 13)

Associated with Cama Beach State Park and shoreline residential areas to south of park.

Public Access (Map 16)

Significant access through Camano Island State Park (134 acres; 6,700 ft. of shoreline) and Cama Beach State Park (433 acres, 5,700 ft. of shoreline). Parks are linked by trail, provide boating (including ramp facility at Camano Island State Park), beach access, fishing, swimming, wildlife viewing, hiking, overnight accommodations (Cama), camping, and other activities.

Armoring (% of shoreline) (Map 13) 24%

Zoning (Map 11)

Parks (73%); Rural Residential (27%)

Overwater Structures (Map 14)

Two remnant piers (no decking present, minimal piles) and several short residential piers south of Cama Beach State Park.

Current Land Use (Map 12)

Number of Parcels 83 **Average Parcel Size** 3.99 Acres
Park uses (largely undeveloped open space) and low density residential development; area of high-intensity recreational use along Cama Beach State Park shoreline (rental cabins and facilities).

Shellfish & Aquaculture (Map 15)

Unclassified; Camano Island State Park approved as a shellfish beach.

KEY MANAGEMENT ISSUES

- 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 — both within Cama Beach State Park and residential areas to south).
- Potential increases in coastal flooding and rates of bluff erosion due to sea level rise (SLR) or other factors may affect shoreline residential development and state park facilities.
- Slope stability and shoreline view / aesthetic implications of additional private shoreline access points on high bank shorelines (accessory to residential development).
- Potential implications of SLR barrier beaches (loss of habitat).
- Water quality issues associated with additional development (subdivision / intensified use) — including implications of septic systems and road runoff.
- Potential use conflicts associated with public access to beaches and private residential property rights.

RESTORATION OPPORTUNITIES

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

- R15:** Remove creosote pile beach access stairway and bulkhead in the north-central portion of Camano Island State Park.
- R16:** Remove creosote pile beach access stairway and bulkhead at the northern portion of Camano Island State Park.
- R17:** Remove upper intertidal / backshore bulkheads at northern Saratoga Shores to uncover potential forage fish spawning and backshore vegetation areas.



REACH CAM09

Saratoga Passage from Cama Beach up to and Including Onamac Point

SHORELINE LENGTH:

2.56 Miles

REACH AREA:

63 Acres

PSNERP PROCESS UNITS:

6042

REACH SUMMARY

Reach CAM09 (Saratoga Passage from Cama Beach up to and including Onamac Point) extends through the unincorporated Camano community (Oblique Photo A). Geomorphic shoreline processes are primarily influenced by a long north-trending drift cell extending from CAM08 north into CAM09 and continuing along the entire west shoreline of Camano Island.

A stream with salmonid use drains to the shoreline at Sandy Beach Drive. Limited areas of wetland and a small coastal lagoon (approximately 1 acre) are in the reach. Aquatic areas provide smelt, pandalid shrimp and Dungeness crab habitat.

Relatively dense single-family residential development occurs throughout the shoreline area along alternating stretches of low-bank and moderate-bank shoreline. The shoreline is generally armored with bulkheads in low bank areas. More intensive residential development and associated infrastructure extends landward of the shoreline area in CAM09, associated with the Camano community.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

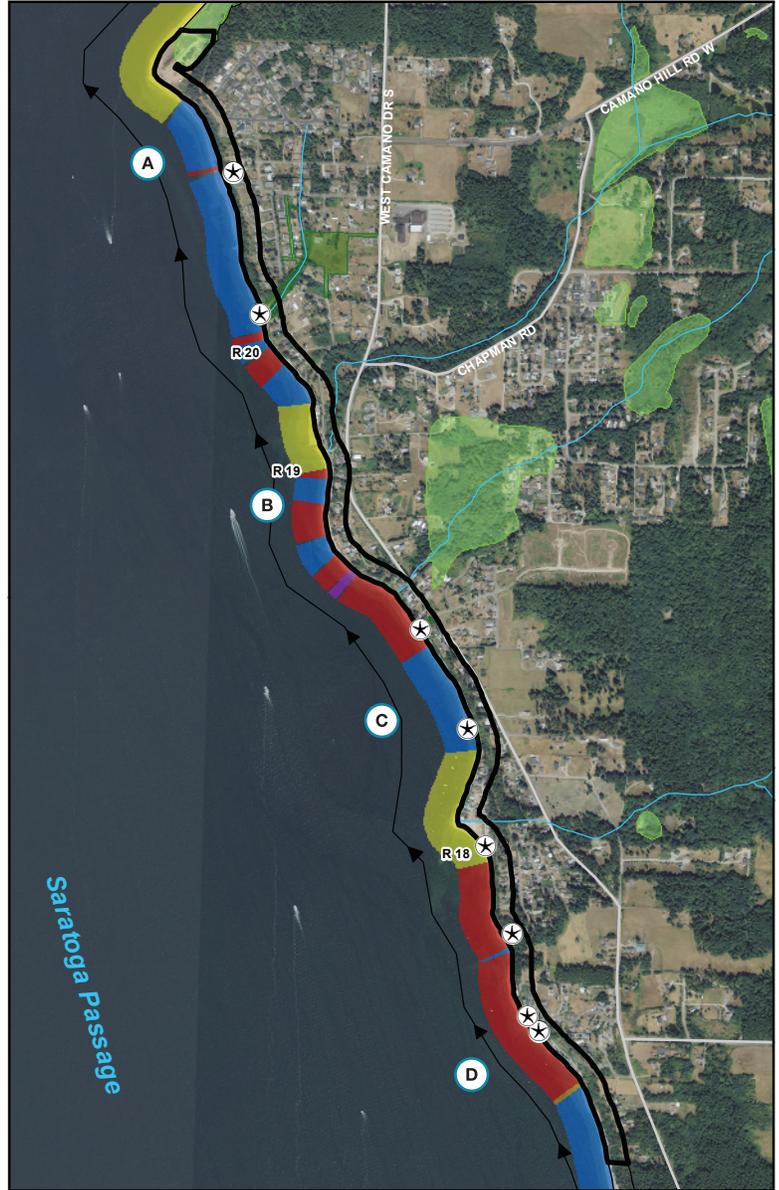
Intermittent Feeder Bluff (43%), Accretion Shoreform (22%), and Modified shoreline (35%) along north-trending drift cell

Net Shore Drift (Map 8)

A long drift cell with northward net shore-drift occurs along most of the western shore of Camano Island, this reach encompasses the middle of that drift cell.

Shoreform Current (Map 10)

Primarily Bluff-backed Beach (94%); Barrier Beach (6%) at northern end of reach



Overall Rating of Degradation

Less (100%)

Coastal Floodplain:

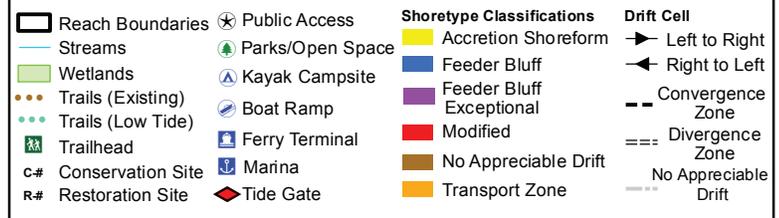
12%

Coastal Landslides & Toe Erosion:

Intermittent toe erosion and landslides throughout reach.

Steep Slopes

33%



Shoreline Oblique Photos (2006)

HABITATS & SPECIES

Significant & Unique Features (Maps 5-7)

Dungeness crab through aquatic extent; offshore pandalid shrimp habitat; continuous and patchy eelgrass.

Shoreland Priority Habitats & Species (Map 5)

Bald Eagle (habitat buffers); Wetlands

Marine Priority Habitats & Species (Map 5)

None mapped

Coastal Lagoons 1 acre (1%) **Coastal Stream Mouths** 4 **Wetlands (Map 4)** 4%

Forage Fish

Sandlance None mapped **Smelt** 69%

Herring None mapped

Salmonid Fish Use (Map 5)

Coastal cutthroat, coho, fall chum in stream draining through Camano community (near Chapman Road); presence/migration for all. Nearshore areas are designated ESA critical habitat for Chinook (Puget Sound ESU) and bull trout.

LAND & SHORELINE USE

Shoreline Modifications (Map 13)

Majority of reach shoreline; highest levels of modification associated with dense shoreline residential development.

Public Access (Map 16)

Private lands with limited public access located at Indian Beach area; Henry Hollow Park (County park, 5 acres) in residential community includes corridor linking to shoreline along a coastal stream (access via Henry Ln); additional County-owned undeveloped park property on shoreline at SW Camano Dr and Camano View Rd ('Hidden Trail - Camano View' parcel, < 1 acre).

Armoring (% of shoreline) (Map 13) 49%

Zoning (Map 11)

Rural Residential (100%)

Overwater Structures (Map 14)

None mapped

Current Land Use (Map 12)

Number of Parcels 197 **Average Parcel Size** 0.50 Acres

Moderate density residential development.

Shellfish & Aquaculture (Map 15)

Unclassified; no mapped or classified shellfish beaches.

KEY MANAGEMENT ISSUES

- 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).
- Potential increases in coastal flooding and rates of bluff erosion due to sea level rise (SLR) or other factors may affect shoreline residential development and cause loss of habitat.
- Slope stability and aesthetic implications of additional private shoreline access points on high bank shorelines (accessory to residential development).
- Water quality issues associated with additional development (subdivision / intensified use) — including implications of septic systems and road runoff.
- Potential use conflicts associated with public access to beaches and private residential property rights.

RESTORATION OPPORTUNITIES

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

- R18:** Remove vertical face bulkhead from intertidal area at the south end of Indian Beach in order to move artificial boundary between upland and beach further landward.
- R19:** Daylight coastal creek that appears to flow through a culvert extending to beach outfall; improve fish passage / access under the adjacent (landward) road.
- R20:** Remove rock and large debris associated with failed bulkhead from the upper half of the intertidal area; restoration would remove impediment to netshore-drift and uncover potential forage fish spawning habitat.



REACH CAM10

Saratoga Passage from Onamac Point to Camano Island Yacht Club

SHORELINE LENGTH:

2.13 Miles

REACH AREA:

53 Acres

PSNERP PROCESS UNITS:

6042

REACH SUMMARY

Reach CAM10 (Saratoga Passage from Onamac Point to Camano Island Yacht Club) is characterized by a largely unmodified shoreline area consisting of a 100- to 200-foot wide zone of coastal bluffs and steep slopes along Saratoga Passage. Shoreline form is primarily influenced by a long north-trending drift cell extending from CAM08 north through CAM09 and CAM10 along the entire west shoreline of Camano Island.

Two short coastal streams drain to the shoreline within the reach. However, neither is used by salmon. Shoreline bluff areas are generally vegetated with mixed forest. Limited areas of wetland and a small coastal lagoon (approximately 3 acres at the south end of the reach) (Oblique Photo D) are mapped. Mapped aquatic areas provide smelt and Pacific herring, pandalid shrimp, hardshell clam and Dungeness crab habitat.

Residential development occurs at rural to moderate densities and is generally set back 150 feet or more from the shoreline, behind steep slope areas. Limited low-bank development occurs behind barrier beach area to the north of Onamac Point. Public tidelands are located along the southern end of the reach, although no public access opportunities are identified.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

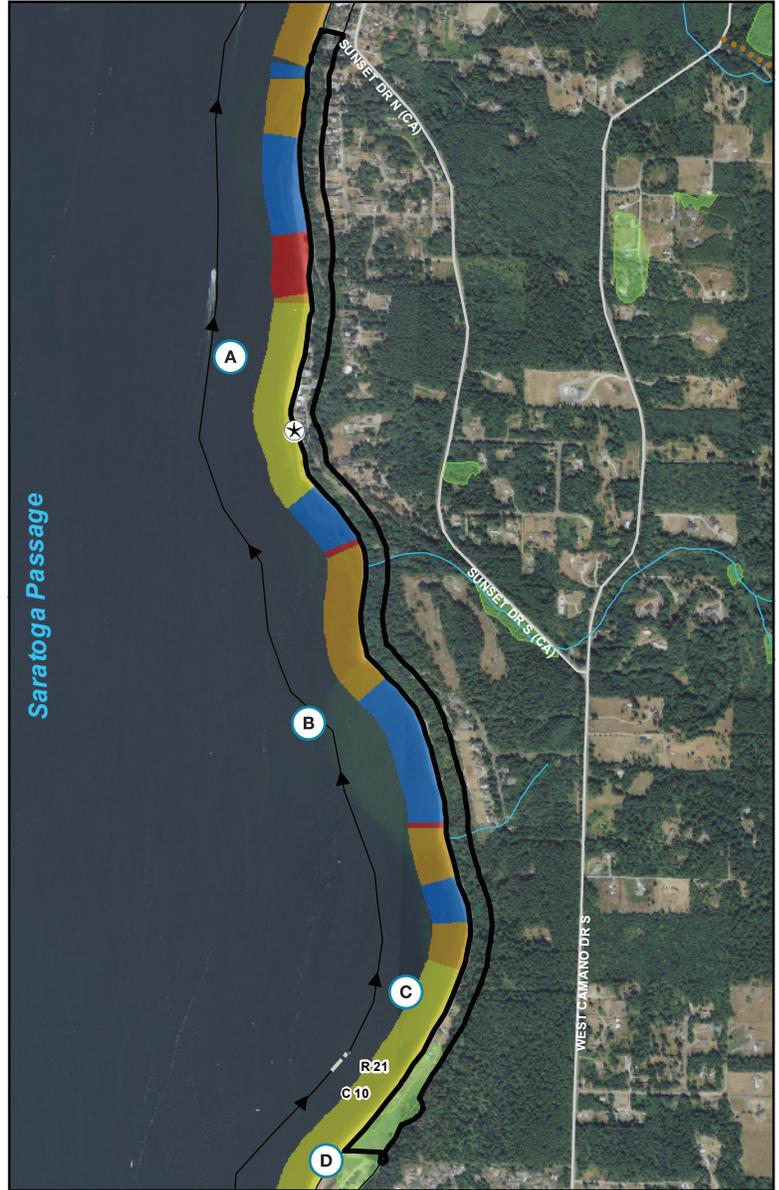
Intermittent Feeder Bluff (32%), Accretion Shoreform (34%), and Transport Zone (29%) along north-trending drift cell; minimal areas of Modification

Net Shore Drift (Map 8)

A long drift cell with northward net shore-drift occurs along most of the western shore of Camano Island, this reach encompasses the middle of the drift cell.

Shoreform Current (Map 10)

Primarily Bluff-backed Beach (70%); two areas of Barrier Beach (30%) in areas of accretion



Overall Rating of Degradation

Less (100%)

Coastal Floodplain:

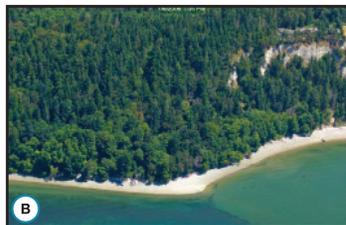
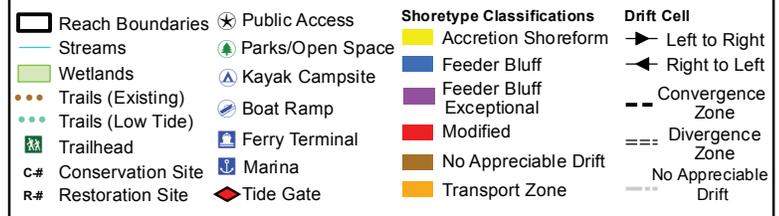
19%

Coastal Landslides & Toe Erosion:

Intermittent toe erosion and landslides throughout reach.

Steep Slopes

63%



Shoreline Oblique Photos (2006)

HABITATS & SPECIES

Significant & Unique Features (Maps 5-7)

Dungeness crab through aquatic extent; hardshell clam habitat at south end of reach; continuous and patchy eelgrass.

Shoreland Priority Habitats & Species (Map 5)

Bald Eagle (habitat buffers); Wetlands

Marine Priority Habitats & Species (Map 5)

None mapped

Salmonid Fish Use (Map 5)

Nearshore areas are designated ESA critical habitat for Chinook (Puget Sound ESU) and bull trout.

Coastal Lagoons 3 acres (6%) **Coastal Stream Mouths** 2 **Wetlands (Map 4)** 12%

Forage Fish

Sandlance 12% **Smelt** 93%
Herring Offshore holding area w/in Saratoga Passage

LAND & SHORELINE USE

Shoreline Modifications (Map 13)

Majority of reach shoreline; highest levels of modification associated with dense shoreline residential development.

Public Access (Map 16)

Public tidelands through southern extent of reach; no apparent access from land (improved or unimproved).

Armoring (% of shoreline) (Map 13) 19%

Zoning (Map 11)

Rural (56%); Rural Residential (44%)

Overwater Structures (Map 14)

None mapped

Current Land Use (Map 12)

Number of Parcels 102 **Average Parcel Size** 1.74 Acres
 Vacant / undeveloped areas within shoreline, with pockets of higher density shoreline development.

Shellfish & Aquaculture (Map 15)

Unclassified; no mapped or classified shellfish beaches.

KEY MANAGEMENT ISSUES

- 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).
- Potential increases in coastal flooding and rates of bluff erosion due to sea level rise (SLR) or other factors may affect shoreline residential development.
- Slope stability and aesthetic implications of additional private shoreline access points on high bank shorelines (accessory to residential development).
- Potential implications of SLR barrier beaches (loss of habitat).
- Water quality issues associated with additional development (subdivision / intensified use) — including implications of septic systems and road runoff.
- Potential use conflicts associated with public access to beaches and private residential property rights.

RESTORATION OPPORTUNITIES

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

R21: Restore tidal inlet & saltmarsh complex at Onamac Point; area may have been partially filled. Channel history should be researched for feasibility of re-establishing fish access.

CONSERVATION OPPORTUNITIES

C10: Preserve coastal wetland remnant.



REACH CAM11

Camano Island Yacht Club to Utsalady Vista and Utsalady (West Side)

SHORELINE LENGTH:

5.37 Miles

REACH AREA:

133 Acres

PSNERP PROCESS UNITS:

6042

REACH SUMMARY

Reach CAM11 (Camano Island Yacht Club to Utsalady Vista and Utsalady — West Side) extends through relatively dense residential communities (in Yacht Club and Rocky Point vicinities). Geomorphic shoreline processes are primarily influenced by a long north-trending drift cell extending from CAM08 north through CAM09, CAM10 to the Utsalady vicinity.

A stream with mapped salmonid use drains to the shoreline just north of the Yacht Club, as do numerous other short coastal streams without fish use. Limited areas of wetland are mapped and there are no coastal lagoons within the reach. Aquatic areas provide smelt, Pacific herring and Dungeness crab habitat.

Relatively dense single-family residential development occurs throughout the shoreline area along alternating stretches of low-bank and moderate-bank shoreline. The shoreline is generally armored with bulkheads in low bank areas. There are existing setbacks of approximately 40 to 50 feet from structures (one low-bank area north of the Yacht Club has large setbacks of approximately 200 feet). Public access to the shoreline is provided via two boat launches.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

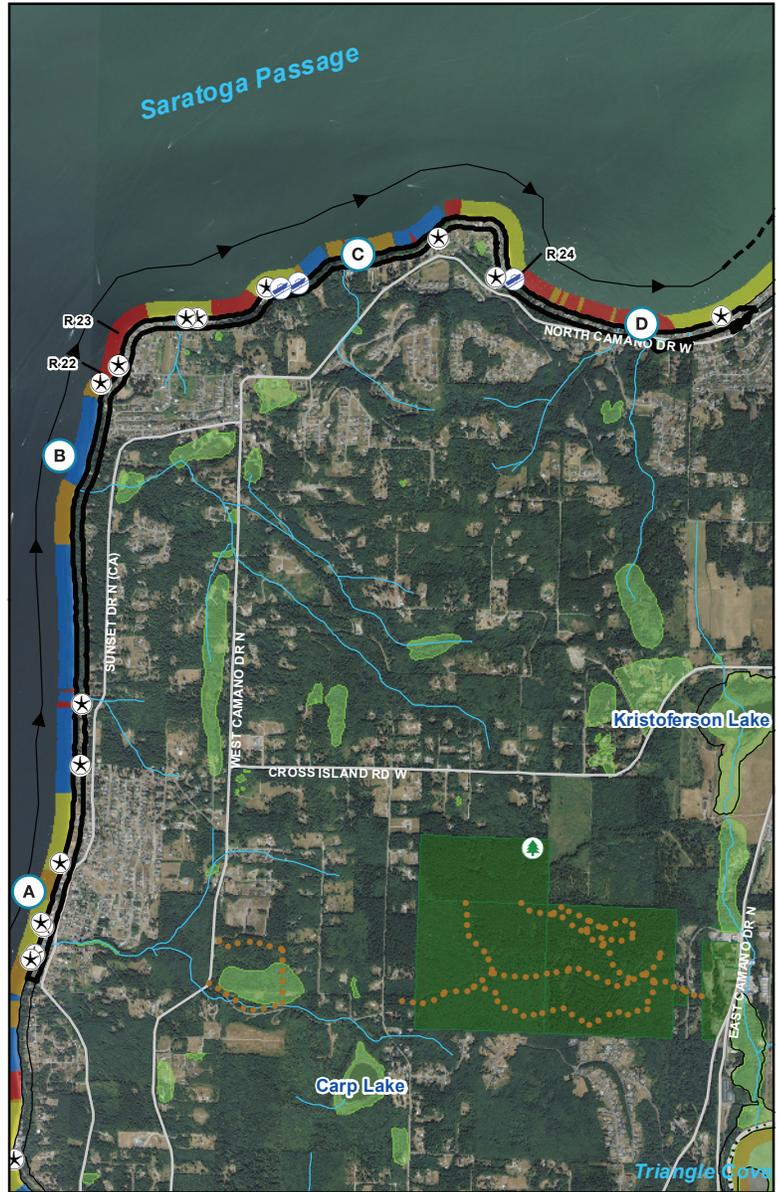
Intermittent Feeder Bluff (31%), Accretion Shoreform (32%), Modified shoreline (22%) and Transport Zone (15%) along north-trending drift cell; areas of accretion support barrier beaches

Net Shore Drift (Map 8)

A long drift cell with northward net shore-drift occurs along most of the western shore of Camano Island; this reach encompasses the terminus of the drift cell. Northward drift transitions to eastward drift at the north end of the island.

Shoreform Current (Map 10)

Primarily Bluff-backed Beach (77%); three areas of Barrier Beach (23%) in areas of accretion



Overall Rating of Degradation

Less (100%)

Coastal Floodplain:

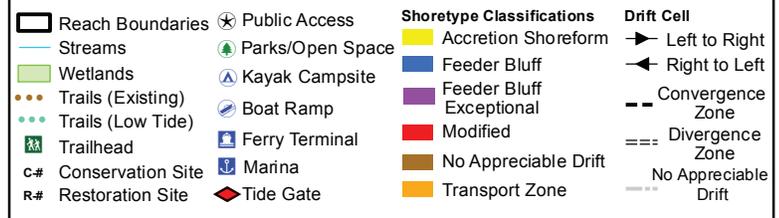
15%

Coastal Landslides & Toe Erosion:

Intermittent toe erosion and landslides throughout reach; extensive erosion south of Rocky Point.

Steep Slopes

39%



Shoreline Oblique Photos (2006)

HABITATS & SPECIES

Significant & Unique Features (Maps 5-7)

Dungeness crab through aquatic extent; continuous and patchy eelgrass; continuous and patchy kelp at south end of reach.

Coastal Lagoons	Coastal Stream Mouths	Wetlands (Map 4)
None mapped	7	3%

Forage Fish

Sandlance 12%

Smelt 95%

Herring Offshore holding area w/in Saratoga Passage

LAND & SHORELINE USE

Shoreline Modifications (Map 13)

Majority of reach shoreline; highest levels of modification associated with dense shoreline residential development; groin / breakwater riprap armoring at Rocky Point.

Armoring (% of shoreline) (Map 13) 50%

Zoning (Map 11)

Rural (27%); Rural Residential (73%)

Current Land Use (Map 12)

Number of Parcels 507 **Average Parcel Size** 0.56 Acres

Moderate density residential development focused at south end of reach and around Rocky Point extending to Utsalady; rural residential development behind shoreline steep slopes/bluffs through central portion of reach.

Shoreland Priority Habitats & Species (Map 5)

Bald Eagle (habitat buffers); Wetlands

Marine Priority Habitats & Species (Map 5)

None mapped

Salmonid Fish Use (Map 5)

Coastal cutthroat (presence/migration) in stream draining Carp Lake to south end of reach. Nearshore areas are designated ESA critical habitat for Chinook (Puget Sound ESU) and bull trout.

Public Access (Map 16)

Maple Grove Boat Launch (County facility, < 1 acre located along W Maple Grove Ln); Utsalady Boat Ramp (County facility, 2 acres located along W Utsalady Point Rd); mapped public lands near Rocky Point; private lands with limited public access located in vicinity of Camano Island Yatch Club; mapped public tidelands accessible via watercraft.

Overwater Structures (Map 14)

1 long (approx 180 ft.) pier/dock at Camano Island Yatch Club; approx. 160 ft. pier near Rocky Point (appears to be private residential use structure); numerous short piers associated with Utsalady shoreline.

Shellfish & Aquaculture (Map 15)

Unclassified; no mapped or classified shellfish beaches.

KEY MANAGEMENT ISSUES

- 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).
- Potential increases in coastal flooding and rates of bluff erosion due to sea level rise (SLR) or other factors may affect shoreline residential development.
- Slope stability and shoreline view / aesthetic implications of additional private shoreline access points on high bank shorelines (accessory to residential development).
- Potential implications of SLR barrier beaches (loss of habitat).
- Continued degradation of shoreline processes due to armoring (bulkheads).
- Water quality issues associated with additional development (subdivision / intensified use) — including implications of septic systems and road runoff (this is a basin-wide issue).
- Potential use conflicts associated with public access to beaches and private residential property rights.

RESTORATION OPPORTUNITIES

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

R22: Remove failed pier and pilings at Camp Grande south of Rocky Point.

R23: Remove rock groins crossing intertidal area at Rocky Pt. to reduce disturbance to littoral drift and potential forage fish spawning habitat. Potential impacts to existing bulkheads may have to be analyzed.

R24: Remove 40-50 piles on upper intertidal beach east of Utsalady boat ramp that remain from an old failed bulkhead; potential for restoration / re-establishment of forage fish spawning area.



REACH CAM12

Utsalady (East Side) to Brown Point

SHORELINE LENGTH:

1.39 Miles

REACH AREA:

33 Acres

PSNERP PROCESS UNITS:

6041 - 6042

REACH SUMMARY

Reach CAM12 (Camano Utsalady (East Side) to Brown Point) extends through relatively dense shoreline residential community in Utsalady to more rural development approaching Brown Point. Reach shoreline processes are primarily influenced by convergence of two drift cells along Utsalady shoreline. Shorelines within Utsalady are primarily low-bank and significantly modified, with moderate shoreline banks and steep slopes occurring further east toward Brown Point.

A stream without mapped salmon use drains to the shoreline (within Oblique Photo C). There are no coastal lagoons or wetlands mapped within the reach. Aquatic areas provide forage fish and Dungeness crab habitat.

Relatively dense single-family residential development occurs along low-banks. The shoreline is generally armored with bulkheads in low-bank areas. Existing structure setbacks of approximately 20 feet are common along the Utsalady shoreline (fronting E Utsalady Road). Setbacks of 150 to 200 feet are typical in the moderate bank areas to the northeast of Utsalady.

GEOMORPHIC KEY INFORMATION

Geomorphic Shoretype (Map 9)

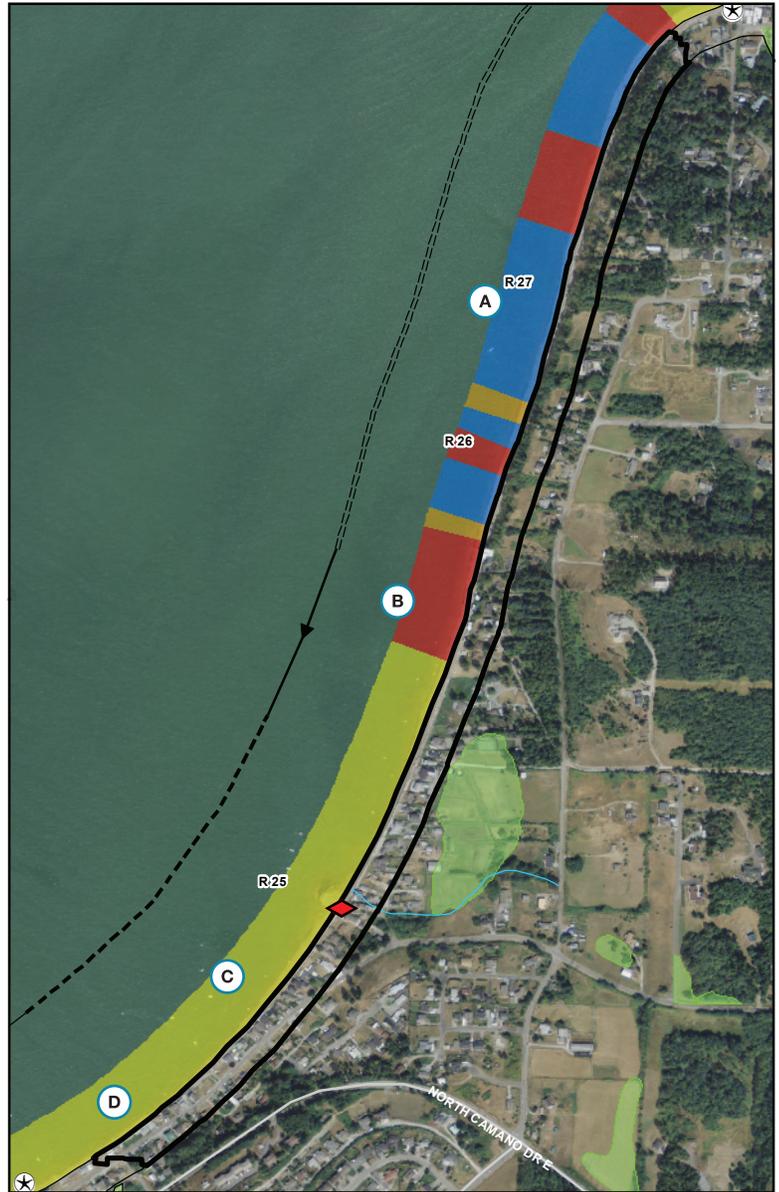
Primarily Accretion Shoreform (48%) in area of Barrier Beach, with Feeder Bluff (28%) and Modified shoreline (21%) extending to northeast

Net Shore Drift (Map 8)

Southwest drift, originating at Brown Point, converges with the terminus of the adjacent drift cell with eastward drift.

Shoreform Current (Map 10)

Bluff-backed Beach (51%) within left to right drift cell, Barrier Beach (49%) supported by area of convergence



Overall Rating of Degradation

Less (46%); More (54%)

Coastal Floodplain:

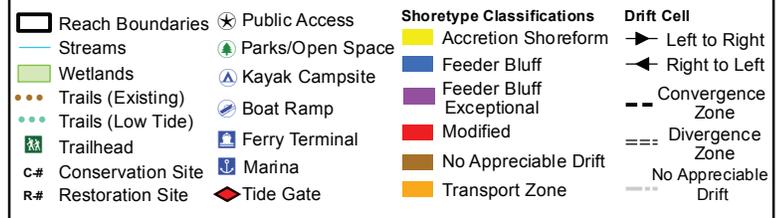
26%

Coastal Landslides & Toe Erosion:

Intermittent toe erosion and landslides throughout reach.

Steep Slopes

18%



Shoreline Oblique Photos (2006)

HABITATS & SPECIES

Significant & Unique Features (Maps 5-7)

Dungeness crab through aquatic extent; continuous and patchy eelgrass.

Shoreland Priority Habitats & Species (Map 5)

Bald Eagle (habitat buffers); Wetlands

Marine Priority Habitats & Species (Map 5)

None mapped

Salmonid Fish Use (Map 5)

Nearshore areas are designated ESA critical habitat for Chinook (Puget Sound ESU) and bull trout.

Coastal Lagoons None mapped **Coastal Stream Mouths** 1 **Wetlands (Map 4)** None mapped

Forage Fish

Sandlance 28% **Smelt** 100%
Herring Offshore holding area w/in Saratoga Passage

LAND & SHORELINE USE

Shoreline Modifications (Map 13)

Majority of reach shoreline; highest levels of modification associated with dense shoreline residential development fronting Utsalady community; tide gate located along eastern side of Utsalady Bay.

Public Access (Map 16)

No mapped public lands or public tidelands.

Armoring (% of shoreline) (Map 13) 82%

Zoning (Map 11)

Rural (70%); Rural Residential (30%)

Overwater Structures (Map 14)

Numerous short piers associated with Utsalady shoreline.

Current Land Use (Map 12)

Number of Parcels 148 **Average Parcel Size** 0.44 Acres
 Moderate density residential development focused at Utsalady.

Shellfish & Aquaculture (Map 15)

Unclassified; no mapped shellfish beaches.

KEY MANAGEMENT ISSUES

- 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 steep slopes).
- Potential increases in coastal flooding and rates of bluff erosion due to sea level rise (SLR) or other factors may affect shoreline residential development and cause loss of habitat on barrier beach.
- Slope stability aesthetic implications of additional private shoreline access points on high bank shorelines (accessory to residential development).
- Continued degradation of shoreline processes due to armoring (bulkheads).
- Water quality issues associated with additional development (subdivision / intensified use) — including implications of septic systems and road runoff (this is a basin-wide issue).
- Potential use conflicts associated with public access to beaches and private residential property rights.

RESTORATION OPPORTUNITIES

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

- R25:** Remove derelict boat ramps and marine railways on beach. A number of failed structures cross potential forage fish spawning areas.
- R26:** Remove 2 pile bulkheads (failed) on upper intertidal within potential forage fish spawning band.
- R27:** Remove failed bulkhead rock from intertidal beach and backshore. Rock is covering substantial portion of potential forage fish spawning band.