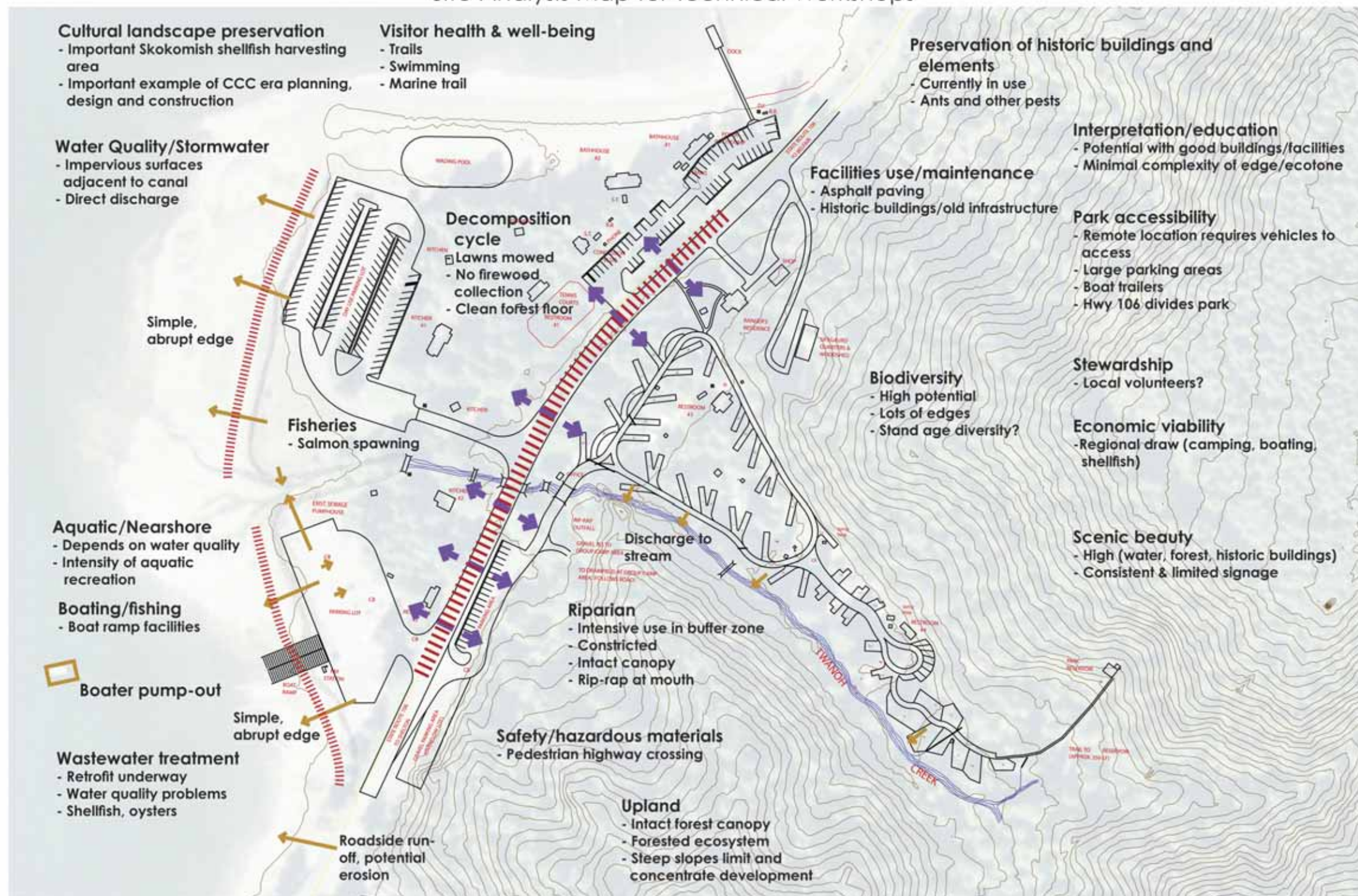


Twanoh State Park - Context Map
Washington State Parks Sound-Friendly Vision Plan

April 2007

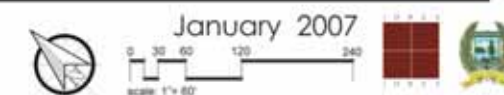
scale: 1" = 300'

Site Analysis Map for Technical Workshops



Twanoh State Park - Site Analysis

Washington State Parks Sound-Friendly Vision Plan



Hydrologic Analysis

Twanoh State Park comprises almost the entire area of the Twanoh Creek Basin that consists of a densely forested upland and shoreline area. Camping and trail systems within the riparian corridor impact the lower reaches of Twanoh Creek. After crossing under Highway 101 in a culvert, Twanoh Creek discharges into Hood Canal.

A private timber harvester owns the upper reaches of the watershed, which is not within the park's boundaries. This area has been logged in the last few years, however the logging company cut trees in a manner to reduce sedimentation and preserve views. With the exception of a few localized sluffs, the watershed does not have unhealthy sediment loading downstream. The lower reaches of the creek does receive runoff from the State Highway and the parking areas

Biogeomorphology / Shoreline Physical Processes Analysis

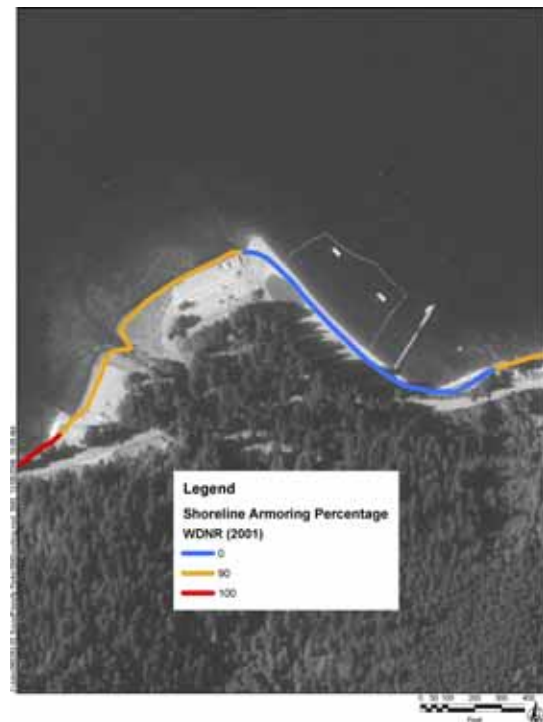
The park's shoreline is an accretion feature (stream delta) reliant on offsite sediment sources. Natural sediment sources to the park are highly limited by 100% bulkheading of the driftcell to the west, and 80% to 95% bulkheading of driftcell to the east. The park contains the only un-bulkheaded areas in either driftcell. All shoreline lands in these contributing driftcells appear to be small private lots for single family homes. Highway 3, even without the residential bulkheads, would be a factor in limiting sediment supply from the adjacent uplands. The boat ramp in the park blocks sediment movement from the southwest and is acting as a groin (sediment is building up on the west side and eroding on the east side).

Twanoh Creek has active sediment sources within the park and possibly in adjoining parcels. Landslides occur in the upper park (and possibly outside the park) every year, according to the park ranger. The stream transports the sediment from these landslides to the delta. Sediment transport within the creek appears to be actively occurring and moving through the system to the creek delta.

The boat launch parking sometimes floods at high tides. The buildings and two parking areas appear to be at long term risk from predicted sea level rise associated with climate change. The sea level rise predicted for the Seattle area is 2.8 feet by the year 2100 (UW Climate Impacts Group website). Slightly different amounts of sea level rise will occur in different locations, based on several factors, including tectonic activity such as subsidence and uplift (Puget Sound Action Team, 2005).



Boat ramp with solid concrete foundation that prevents longshore sediment movement



Percentage of Shoreline Armoring in Twanoh State Park

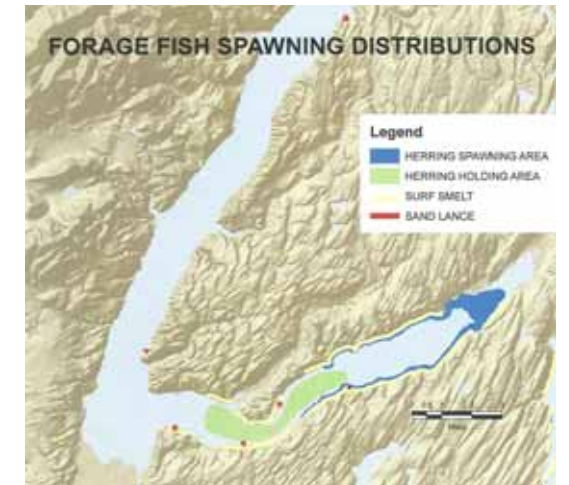
Habitat Analysis

Twanoh State Park is located in a small, relatively undeveloped watershed. Key habitat features of the park include Twanoh Creek, approximately one-half mile of shoreline along Hood Canal, and a large forested area. The park comprises a significant percentage of the Twanoh Creek watershed. In this watershed, the only habitat modification outside the park has been logging in the upper watershed. The upper watershed logging occurred as recently as 2004. Overall, the watershed is in relatively good condition in terms of low levels of roads, and other impervious surfaces.

In this portion of Hood Canal, eelgrass is abundant in the shallow water along the shoreline. Pacific herring spawn throughout this area, and their eggs stick to eelgrass and other aquatic vegetation. Pacific oysters are abundant, and WDFW seeds the park shoreline to promote oyster production. Poor water quality in Hood Canal has closed the park area for shellfishing and has led to multiple fish kills due to low dissolved oxygen levels.

A largely intact primarily coniferous forest canopy grows in park uplands. The upper watershed area outside of the park was logged in 2004. The park's upland areas provide expansive habitat for birds and other wildlife. Twanoh Creek forms a natural migratory corridor from the upper watershed to Puget Sound. The understory vegetation in the day use and campground areas is generally lacking and has been impacted by human use associated with camping, picnicking, or parking.

Twanoh Creek supports spawning by coho and chum salmon, and steelhead and cutthroat trout. The creek has a largely intact and high-quality stream and riparian corridor except in some areas of the lower park. Adjacent campsites greatly limit riparian vegetation along the creek. Instream habitat features appear to be limited. A largely intact primarily coniferous forest canopy grows in park uplands. Within the developed area of the park, including the riparian corridor, understory vegetation in the day use and campground areas is largely missing.



Forage fish spawning areas in lower Hood Canal



Chum salmon moving up Twanoh Creek



Armored creek mouth with narrow band of marsh vegetation.
Note: armored boat ramp extending far into intertidal zone.

The mouth of Twanoh Creek is armored with riprap. The riprap extends from approximately 100 feet upstream of the mouth and continues along the shoreline beyond its mouth. The bank armoring constrains the channel and limits its natural channel migration, but it is wide enough to support a narrow patch of marsh vegetation. The estuarine marsh vegetation colonizing the delta estuary is extremely limited in extent (approximately 200 to 300 square feet) compared to historical conditions (in the range of 2 to 3 acres), based on the 1886 T sheet map. Marsh vegetation contributes to beach stability and functions in several ways to support the production of potential prey items for salmon and other aquatic species (e.g., supports production of macroinvertebrate prey, contributes to nutrient cycling, produces organic matter, reduces water velocity to provide energy refuge for fish and promote sediment deposition).

The Hood Canal shoreline is armored for approximately 600 feet on either side of the creek. To the west, the shoreline is armored continuously to the park boundary. This area includes a boat ramp with a concrete foundation extending into the intertidal zone. A parking lot is situated along this part of the shoreline. To the east, the riprap continues to the point. Behind this armoring, fill material has been added and a large parking lot and lawn area are maintained. The current armored shoreline extends approximately 150 feet further waterward at the creek mouth compared to historic conditions.



Armored mouth of Twanoh Creek and Puget Sound Shoreline

The armoring of the creek mouth and beach shoreline greatly reduces the quantity and quality of upper intertidal and backshore habitats. The upper intertidal and backshore habitats are important components of a high functioning shoreline. These areas contribute to the sustainability of the beach habitat. Armoring of the beach and filling of the backshore reduces areas suitable to support marsh vegetation. The upper intertidal zone also provides important refuge and rearing habitats for juvenile salmonids (from Twanoh Creek and elsewhere) in the nearshore. Armoring along beach also reduces the availability of habitat for two "forage fish" species that salmon prey upon. Sand lance and surf smelt spawn in sand and gravel in the upper intertidal zone. Forage fish spawning is documented along the unarmored portion of park shoreline, but the armored area east of boat ramp does not provide suitable spawning habitat for forage fish due to absence of sand/gravel in upper intertidal zone.



Shoreline armor between the parking and the water

To the east of the shoreline's point, the beach is unarmored. A steep beach with extensive oyster shells and small cobble forms a berm that has been modified to form a children's wading pool. Historically this area and the swim beach was a spit protecting a narrow lagoon feature. The connection of the lagoon to Hood Canal was where the east parking lot borders the rock revetment. The wading pool appears to be located within the former lagoon boundary but is only a quarter of the size of the former lagoon. The east parking lot and rock revetment appears to have "plugged" the connection of the lagoon to Hood Canal (State Parks personal communication). Lagoons can provide exceptional habitat for juvenile salmon that use the areas for rearing. Marsh vegetation contributes to beach stability and functions in several ways to support the production of potential prey items for salmon and other aquatic species (e.g., supports production of macroinvertebrate prey, contributes to nutrient cycling, produces organic matter, reduces water velocity to provide energy refuge for fish and promote sediment deposition).



Historic shoreline at park overlaid on photo of current condition. Note the historic lagoon and expansive marsh as well as current shoreline location compared to historic shoreline



Native American seasonal fishing influenced village locations



Swimming at the Twanoh State Park pier in the 1960s

Cultural/Historic Analysis

The lower Hood Canal is the ancestral homeland of the Skokomish people, the largest of the “Twana”-speaking tribes of the Hood Canal area. The Skokomish occupied nine primary villages and over 30 wintering sites. Their land use patterns were not prescribed, but driven by seasonal need. The present day Twanoh State Park was a seasonal fish camp frequented by the Native Americans who fished the historically strong chum run at the mouth of the creek. In pre-treaty times, they used a three-foot long digging stick with a blunt end to dig a hole in the sediment and harvest clams and oysters from Twanoh’s beaches. Clam rakes that excavate larger portions of the beach have since replaced this low-impact harvesting technique because shellfish are not as abundant. In addition to shellfish harvesting, the Skokomish used the State Park area for berry gathering on the hills above the canal, for deer and elk hunting, and for gathering of basketry material.



A CCC-era building at Twanoh State Park



Campground south of Highway 106

More permanent development began in the State Park area after it was logged in the 1890s. The development began as a private resort and was later incorporated into the Washington State Park system. The Civilian Conservation Corps (CCC) built the majority of existing structures and facilities at Twanoh in the 1930s. Along with the existing park buildings, the CCC facilities include the day-use parking area along State Route 106, the split-rail fencing, the restrooms near the beach, the tennis courts, and the picnic shelters. The layout, materials, and siting are all consistent with a CCC cultural landscape. The structures and facilities see limited, seasonal use. They are in fair to good condition, although there have been problems with pest infestations.



Wading pool and park facilities on east end of park

Recreation Analysis

As is typical of a state park located on the shoreline of Puget Sound shoreline, visitors use Twanoh State Park for a wide range of active and passive recreation activities: boating, kayaking, dive training, fishing, hiking, picnicking, shellfish harvesting, swimming, tennis, and tent camping. WSPRC advertises the park as a marine camping park, and its primary recreation features are the boat launch, wading pool, pier, and campground. Park rangers describe the boat launch as the most popular in the lower Hood Canal, because of its proximity to Tacoma and Olympia and the warmth of the water compared to the relative coldness of Puget Sound. Families from all over the United States have been camping at the State Park for generations, given the wealth of natural environment and the abundance of recreation facilities.



State route 106 runs along the south shore of the Hood Canal and bisects the park

The launch and parking area occupy the entire shoreline area that is west of the mouth of Twanoh Creek . There is an existing Marine Trail landing campsite for the Hood Canal just to the west of the boat launch. Park rangers note that the wading pool is extremely popular, but it is not safe for young children because of the depth in the center of the pool. The tidal gate does not currently function properly, and allows water exchange during tidal influx. A functioning tidal gate would create water quality problems in the wading pool because it would allow the pool to retain water at any tidal level, creating higher bacteria counts. Permits to replace the tide gate have been denied.

Recreationists access the park by driving their car or RV along State Route 106 parallel to the Canal’s shoreline and through the middle of the park before entering one of the day use parking lots adjacent to the water or the overnight campground amongst the trees. From a recreational and ecological perspective, the highway and parking infrastructure occupy the most sensitive and significant areas in the park. The configuration of parking lots and highway immediately adjacent to an armored shoreline prevents people from accessing a dynamic shoreline and interacting with the complex land-water ecotone. The location of the highway through the middle of the park forces visitors moving from the campground to the shoreline to cross the highway.



Existing boat launch in the winter

Community Site Analysis:

Twanoh State Park participates in numerous community-based programs, including the Forest stewardship program, Shoreline stewardship program, and the Hood Canal Water Environmental Network (HCWEN). Rangers lead school groups and coordinate with local environmental organizations on environmental monitoring and educational activities within the park. Park staff partner with local community groups, such as the Belfair Chamber of Commerce, Kiwanis, Rotary, and Lions Club, on an informal basis to identify community needs and give the park a voice in civic dialogue. Beyond these informal and individual connections, Washington State Parks sees an opportunity to expand partnerships with local city and county governments and environmental advisory groups.



*Existing location of marine trail pull-out spot
at west end of park*