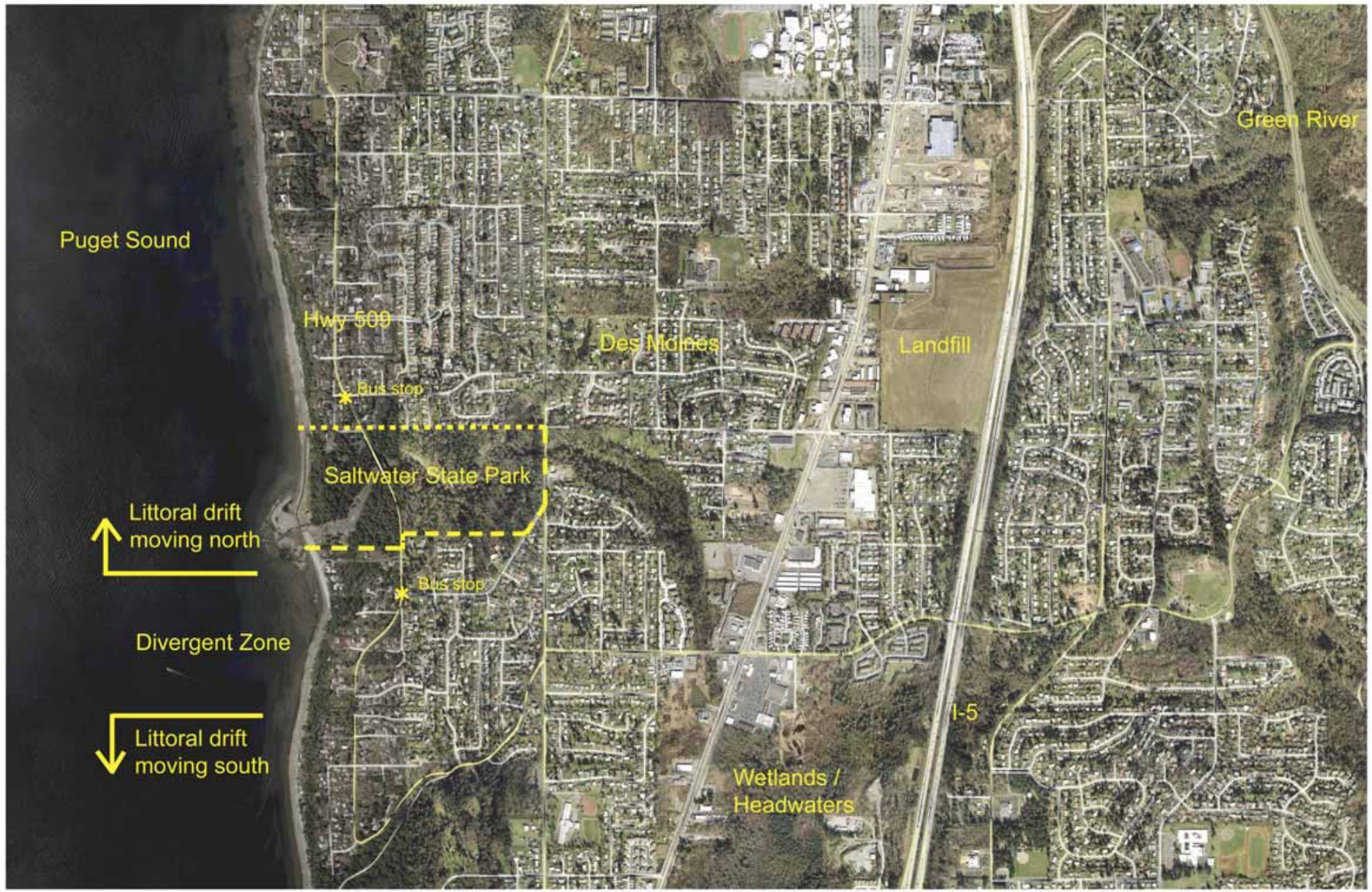
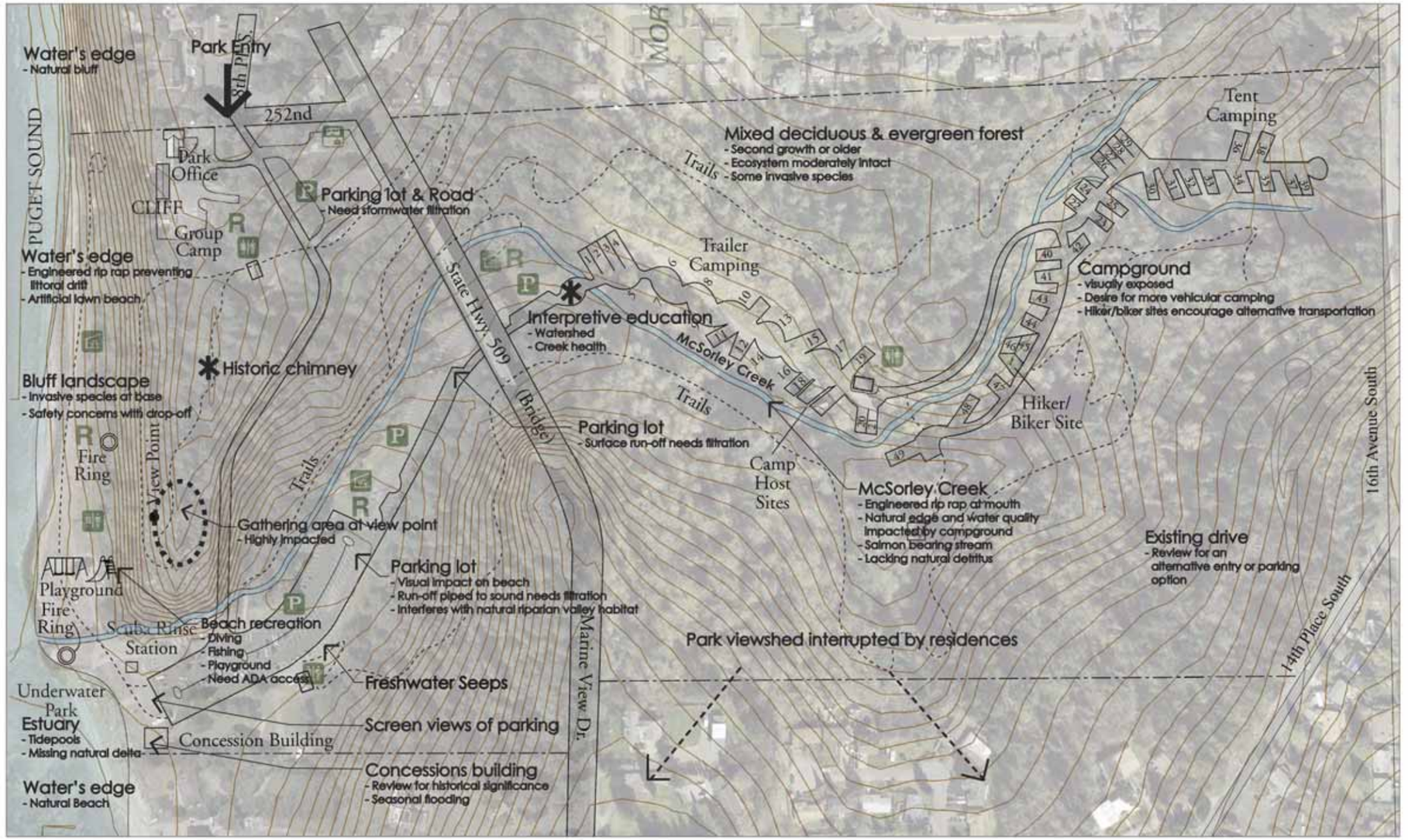


Saltwater State Park - Context Plan
Washington State Parks Sound-Friendly Vision Plan

January 2007

SITE ANALYSIS MAP FOR TECHNICAL WORKSHOP



Saltwater State Park - Site Analysis
Washington State Parks Sound-Friendly Vision Plan

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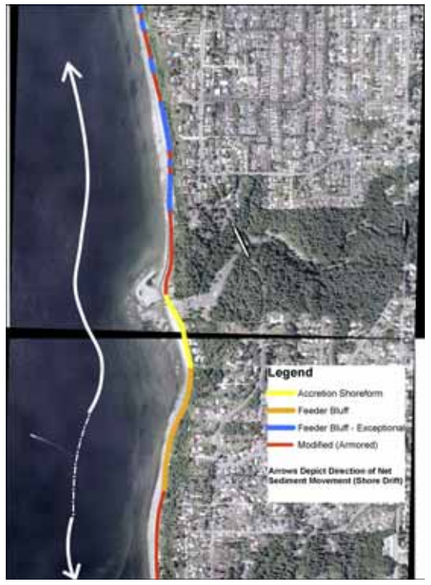

Net Direction of Nearshore Sediment Transport and Shoretypes at Saltwater State Park

Example of Feeder Bluff Contributing Sediments to Puget Sound

Hydrologic Analysis

The lower reaches of McSorley Creek are located entirely within Saltwater State Park. McSorley Creek provides drainage to portions of the City of Kent, City of Federal Way, and City of Des Moines. The former City of Seattle Midway Landfill affects the headwaters of the north branch of McSorley Creek as well. During heavy rains, runoff from the landfill discharges into the creek. Wetlands at the headwaters of the south fork of McSorley Creek provide natural attenuation of storm events. The north and south forks of McSorley Creek converge within Saltwater State Park before discharging into Puget Sound.

McSorley Creek also receives urban runoff at various locations between the headwaters and the delta at Saltwater State Park. Residential and commercial impervious areas contribute pollutants (metals and hydrocarbons) to the creek. Sediment loading and degradation of the riparian corridor have reduced natural areas along the stream corridor. Parking areas and campgrounds are located adjacent to the creek and close to the shoreline. Additional pollutants and sediments enter the system within the park, as well as from surrounding neighborhoods. Existing parking lots and roadways were not designed to treat or control the stormwater runoff within Saltwater State Park.

Biogeomorphology / Shoreline Physical Processes Analysis

The park is located within 300 feet of the updrift end of a 2.1 mile driftcell (Johannessen et al, 2005, and Schwartz et al, 1991). The driftcell ends at the Des Moines Marina breakwater. Prior to the marina's breakwater construction in 1969, the driftcell extended north the Three Tree Point, roughly tripling its current length (Schwartz et al, 1991). The park is near the location where prevailing south winds gather enough strength to overcome the sheltering effect of Dash Point, several miles to the south, and transport sediment in a net northerly direction. The estimated drift rate at the terminus of this drift cell is 4,912 cubic meters per year (Schwartz et al, 1991). Current conditions of the drift cell are that 55% of the shoreline is modified, mostly by residential development, resulting in a substantially reduced sediment supply. Most of the remaining sediment supply areas are at the south end of the driftcell near the park. These supply areas are defined as "feeder bluffs" and constitute 28% of the current shoreline. The current conditions contrast with historic conditions, when 83% of the driftcell was considered feeder bluffs. Accretion shore forms, those areas where sediment is accumulating, currently comprise 16% of the drift cell (Johannessen et al., 2005). The 760-foot-long McSorley Creek delta at the park comprises one of the two accretion areas; the second location is at south side of the Des Moines Marina breakwater.

The concession building and adjacent paved picnic area is in a low area and floods during high tides. The building appears to be at or below the level of the adjacent beach backshore. It is separated from the beach by a 2–3-foot-high grass covered berm. Water backs up behind this berm and comes out of catch basin grates during high tides, according to State Parks staff. The building and adjacent low areas are at long-term risk from predicted sea level rise associated with climate change. The sea level rise predicted for the Central Puget Sound between Seattle and Tacoma is approximately one meter by the year 2100 (Puget Sound Action Team, 2005).

Habitat Analysis

Saltwater State Park is located in a suburban setting in the Central Puget Sound Region. Key habitat features of the park include McSorley Creek, approximately one-quarter mile of shoreline along Puget Sound, and a large forested area. While the park provides greater habitat function than the highly developed adjacent areas, many of the alterations made for park uses have reduced the quantity and quality of habitat. In fact, the altered park shoreline and creek are identified in the WRIA 9 Salmon Habitat Plan as a priority restoration action to support salmon recovery in the Green-Duwamish Watershed.

1936 Aerial Photo and current shoreline configuration (red line). Note that McSorley Creek historically enters Puget Sound further south and shoreline has been filled to extend shoreline waterward from historic configuration.

Aquatic Habitats and Species

McSorley Creek is a salmon-bearing stream that flows approximately 1 mile through the park before draining into Puget Sound. The creek supports coho and chum salmon and cutthroat trout. Steelhead is also reported in the creek, but this is an infrequent occurrence.

Two forks of the creek come together about mid-way through the park. The headwaters of both forks are upstream of the park boundary, but approximately 75% of the total length of McSorley Creek is in the park. The headwaters of the south fork of McSorley Creek consist of a 78-acre Category 1 forested wetland (WSDOT 2003 State Route 509 EIS). Local and state governments develop wetland ratings, and 1 is the highest quality wetland, while 4 is the lowest quality. King County tax parcel data indicate that approximately 12 parcels comprise this wetland. Ownership includes private residential, business, King County, and the State of Washington Department of Transportation. Development of the upper watershed wetlands would impact McSorley Creek. Currently, King County Department of Development and Environmental Services reports only one permit application among the parcels. Long-term protection of these wetlands from development impacts is necessary to prevent further degradation of the McSorley Creek watershed.

Within the main day use area of the park, one or both banks of McSorley Creek are armored with riprap. In the areas where both banks are not armored, the creek is pushed against a steep valley wall in the park, which diminishes channel migration. In the camping area of the park, the bank armoring constrains the channel, but provides some room for the creek to meander and form small gravel bars. Instream habitat features are generally lacking, but there are several areas with suitably sized substrate for salmon spawning. Sporadic pieces of large woody debris have been placed in the creek channel upstream from the main entrance road. In the lower portion of the creek (i.e., downstream of the park road overpass), the creek has been pushed against

Straightened channel at mouth of McSorley Creek

the northern margin of the valley floor. Historically, this lower creek section likely meandered across the entire valley floor. The inability of the creek to migrate across an active floodplain limits natural creek processes; the creek is unable to form natural stream meanders that provide habitat complexity such as pools and gravel bars. In the lower portion of the creek, the modified corridor is significantly narrowed and channelized. This creates a straight flume-like channel that provides no desirable habitat for salmonids. The narrowed channel results in higher velocities that transport desirable small spawning substrates such as gravel and small cobble out of the system.

Park uses along the banks of McSorley Creek have significantly reduced the amount of native riparian vegetation. In the camping area, riparian vegetation has been almost entirely removed on one bank to allow for campsites immediately adjacent to the creek. In the lower portion of the park, riparian vegetation is non-existent or limited to a narrow line of trees.

A small seepage wetland exists on the south side of the lower parking lot and day use area and is separated from the creek by the parking lot. Other potential wetland areas are on the north side of the creek upstream of the bridge. These areas appear to be within the current or historic (pre-park development) floodplain of the creek. The larger area is closest to the bridge and does not appear to have been significantly modified within the park. However, this low-lying area may have formerly extended much further outside the park and was subsequently filled in.

The mouth of McSorley Creek is straightened and narrowed by a steep riprap revetment that extends into the intertidal zone of Puget Sound. These riprap walls severely impair the habitat function of the creek mouth. The constriction causes higher water velocities, particularly during high flow events that can sweep juvenile salmonids out of the creek prematurely. The narrow mouth also prevents flows from dispersing across multiple small channels that provided a larger mixing zone area for the transition from freshwater to saltwater. The armored creek mouth also provides no habitat for an estuarine marsh. In a natural setting, McSorley Creek would support a broad estuarine marsh on either side.

The riprap forming the mouth of McSorley Creek continues along the park's Puget Sound shoreline. To the south of the creek, the riprap revetment turns back and connects to the beach backshore. The addition of fill material in this riprap lined area creates a fairly small upland lawn area. Further south, the shoreline is unarmored and a large accumulation of drift logs forms a stable backshore. To the north of the creek, the riprap revetment turns to run parallel to the base of the bluff, then gradually angles back to connect to the upper intertidal zone near the northern park boundary. In this way, the riprap revetment supports an expansive lawn area to the north of McSorley Creek. This created lawn area buries a historic vertical concrete bulkhead that is buried along the approximate alignment of the paved path. Several locations in this lawn area are eroded as much as two feet below adjacent areas. This erosion appears to be associated with low stretches of armoring. State parks staff indicated that this is a deferred maintenance issue.

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 and contribute to the sustainability of the beach habitat. The shoreline armoring disconnects sediment contribution from the bluff to the intertidal zone. This eliminates the bluff's potential as a sediment source to "feed" sand and gravel to an extended stretch of beach that extends far beyond the park boundaries. These impacts may be exacerbated by the riprap armoring at the creek mouth which traps northerly moving sediment on the south side of the creek, and possibly accelerates erosion just north of the park boundary (Hugh Shipman, personal communication, 2006).

Shoreline armoring at mouth of McSorley Creek and along Puget Sound shoreline. See 1936 photo above left for comparison to historic shoreline location.

The upper intertidal zone also provides important refuge and rearing habitat for juvenile salmonids (from McSorley Creek and elsewhere) in the nearshore. Armoring of the beach and filling of the backshore also eliminates areas suitable to support marsh vegetation. 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. 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. The shoreline armoring along the park appears to eliminate suitable spawning for these fish.

View of disconnected feeder bluff in park (right) and connected feeder bluff adjacent to park (left)

Park manager's residence

Terrestrial Habitats and Species

With the exception of parking and camping areas, much of the park is forested. Upland vegetation includes forested areas along the ravine slopes, and along the top of the bluff on the north side of the park. At the bluff top, the plant community is associated with a drier regime consisting of Douglas-fir as the dominant tree species with some madrone; understory species include salal, bracken fern, and oceanspray. Along the ravine slopes, a moister regime exists with red alder, black cottonwood, big leaf maple, grand fir, and western hemlock trees, and some areas of salmonberry in the understory. Overall, the tree canopy is in good condition. Understory vegetation (shrub and ground cover layer) lacks structure, and diversity of native species.

Non-native invasive species are extensively colonized in forested areas throughout the Park. English ivy, English holly, scotch broom, and Himalayan blackberry are all present, and in some cases, past management practices promoted these species. For example, Himalayan blackberry along the beach bluff was used as a tool to discourage park users from attempting to scale the lower portions of the bluff.English ivy is the most widespread, covering much of the forested understory. The ivy is suppressing the growth and diversity of native shrub and ground cover species, contributing to a lack of a more complex, multilayered habitat structure in the forest areas. Control methods have included hand removal of English ivy from trees by volunteers. This control has helped to substantially reduce the direct threat to many of the trees in the park at the present time. However, removal of the ivy from the understory has not been undertaken. This limited approach results in the continued threat to the trees as the ivy grows back, and the continued negative effects of the ivy on the overall biological diversity and habitat structure of the forested areas.

Cultural/Historic Analysis

Prior to 1930s park development, Saltwater State Park and its surrounding environs were the homelands of the Muckleshoot, Duwamish, and other indigenous peoples. Their historic presence is evidenced by shell mounds found on the beach during past archaeological investigation. The freshwater delta created where McSorley Creek meets the Puget Sound provided easy access to the beach and fishery resources that would otherwise be inaccessible due to the surrounding bluffs. This area provided opportunities to harvest saltwater shellfish, to catch salmon in the sound and creek, and to collect other important plants and animals. Interpretive and educational efforts should capitalize on this history, while new design and construction efforts should include research and field investigation to determine the presence of artifacts or other cultural significance.

Constructed in the 1930s, largely by the Civilian Conservation Corps (CCC), the park and its buildings exemplify the unique design and construction of this era. Historic Structures Reports offer detailed information about the significance and integrity of Saltwater State Park's historic buildings and structures.

The most historically significant structures are the park office and ranger housing buildings near the entry. Constructed with indigenous stone bases and logs, they are relatively intact and provide an opportunity to educate the public about the massive work effort of the CCC. Though generally well-maintained, they do reveal a variety of non-historic, utilitarian interventions and additions, including shed attachments, wall infills, and window replacements and interior renovations. The stonework of the era is also evidenced in the outdoor chimney at the group campfire area. Although the iron lintel exhibits distress, the structure is otherwise in good condition.

Fire pit

Concessions building

The concessions building at the beach is of more recent construction. Its stone hearths may contribute to the park's historical significance, but its wood frame construction has been altered over time and is of less value. The structure is in a depressed area within the creek's flood plain and is subject to flooding due to tidal and/or stormwater events that periodically overwhelm the drainage system. The post-and-beam picnic shelters are Depression-era in style only; dating from the 1970s, these structures are not historically significant.

Additionally, Saltwater State Park contains several small historic features and structures from the CCC-era such as the fire rings, the largely submerged seawall, stone fountains, etc.

Picnic shelter

When originally dedicated in 1926, Saltwater Park was meant to end competition between the cities of Tacoma and Seattle. Located halfway between the two cities, a symbolic hatchet lies buried under a rock within the park (Washington State Parks web page 2007).

For several decades, Saltwater Park was a relatively rural park accessed by many generations for its recreational opportunities in a Puget Sound location that was outside major development areas. Today, residential housing and neighborhoods occupy local near shore areas. While the landscape context around the park has changed over time, however, community members, generations of Saltwater Park users, and new visitors highly value the shoreline experiences offered by Saltwater Park.

Recreation Analysis

Picnic lawn

As a precious sliver of the native Puget Sound environment surrounded by urban uses, Saltwater State Park provides visitors with numerous recreation opportunities that are consistent with its natural character. Activities such as diving, swimming, fishing, tide-pooling, biking, hiking, wildlife viewing, kayaking, picnicking, and low-impact camping all harmonize with the natural bluffs, upland forest, riparian creek corridor, and saltwater beach that characterize the park. These types of recreational activities immerse the visitor in Puget Sound environment by providing direct connection with nature. These low-impact uses and programs are Sound-Friendly in that they can be designed to minimize impacts; Washington State Parks can seek opportunities to should continue to enhance these activities through future design and planning efforts.

Other recreational amenities, such as the playground and lawn were placed along the waterfront, and offer important recreational benefits. However their nearshore location impacts the environment by displacing the natural beach habitat and its associated ecological functions with lawn. Recreational playing, picnicking, and gathering will continue to exist in the park, but design efforts should seek a more ecologically sensitive integration of these activities into the natural environment. Design efforts could work to incorporate playing and picnicking within a natural beach or bluff environment in a way that minimizes impact while enhancing visitor experience and connection with the unique Puget Sound setting.

Vehicular camping at Saltwater State Park, while popular, does not contribute to a healthy Puget Sound. While the opportunity to camp without lengthy travel benefits the local community, vehicles and campers require a large area of paved surface and contribute camping waste and vehicular pollutants to the watershed. This problem is complicated by the location of the campground immediately adjacent to the creek. Campsites comprised of pavement, picnic tables, utilities, cleared areas, and social trails largely replace the riparian vegetation that would normally help to filter sediment and pollutants out of stormwater run-off. Saltwater State Park camping also causes creekside soil compaction and erosion problems. Recently, park users have expressed a desire for more "comfort camping" in the form of cabins or yurts. If this desire is accommodated, it must be integrated in a manner that minimizes impact to sensitive areas of the park.

Railing

Playground and picnic lawn

Community Analysis

Saltwater Park has a unique opportunity to instill residents with a passionate connection to Puget Sound. By illustrating the unique ecology of the Sound, the park can motivate people to care about the environment and exercise stewardship in their daily lives. Likewise, community members with a strong connection to their park are likely to protect it. Community appreciation is visible in the large volume of visitors the park attracts, and support is visible in the work of volunteers who care for the park by removing invasive ivy and conducting other stewardship activities. This type of park-community relationship can be strengthened through increased partnering with the City of Des Moines and non-profit groups.

Strategies may be developed to tap into community service groups, schools, and colleges who can use the park as a living laboratory for research and education, assist with planting and restoration efforts, or use the park for stewardship camps or other retreats. All design efforts should be coupled with outreach and publicity efforts to highlight the unique identity of the park and the actions being taken to protect it. Most importantly, to maintain a strong relationship with the community, the recreational needs and desires of users will be appropriately integrated, and the public will be provided with a conduit to participate in planning decisions about the park.

Camping registration booth

Dumpsters in campground at creek edge

Campground