

**GOAL 1**

**HEALTHY WATER QUALITY: Reduce water and sediment pollution into the Puget Sound**

Washington State water quality standards were updated in 2005. Providing stormwater treatment within Twanoh State Park will bring the Park into compliance with current regulations as outlined by Washington State Department of Ecology (updated in 2005). Reducing the amount of impervious surface within the Park by 30 percent will reduce peak flows from the Park by 20–30%. Low-impact development elements that treat stormwater, such as rain gardens, bioswales, porous pavements, and bioretention areas, can also serve as landscape amenities. Native plants should be used wherever possible to provide habitat and create a Pacific Northwest aesthetic throughout the park, in keeping with the park’s cultural landscape.

**Strategy 1: Reduce effective impervious areas and maximize infiltration.**

Action: *Resurface and/or reconfigure existing shoreline parking areas to maximize infiltration (i.e. porous pavement).*

At present, stormwater runoff from the existing parking areas near the shoreline is collected into catch basins and asphalt ditches before discharging directly into Puget Sound. Reconfiguring the current drive aisles and parking spaces to minimize pavement area and using porous pavements will reduce runoff.

Action: *Partially remove parking spaces immediately adjacent to the shoreline in both shoreline parking lots and relocate to upland side of highway.*

All parking areas within the state park should be redesigned to meet current parking standards, including stormwater management requirements.

Action: *Remove shoreline day use parking lot and relocate to existing campground area. Replace parking lot with walk-in camping/picnicking and a restored shoreline.*

Providing parking on the southeast side of the state highway will reduce car-related water pollution near the beach. The parking within the camping area and upper parking areas should be redesigned to narrow the drive aisle and create smaller spaces in order to reduce runoff. The shoreline parking lot could be replaced with Sound-Friendly programming, including walk-in camping/picnicking and a restored shoreline recreation area.



*Day use and parking area along the shoreline*



*Gravel parking with stormwater treatment in the center*



*Proximity of existing parking area to shoreline*

Action: *Provide infiltration trenches, bioswales and rain gardens.*

Infiltration swales or rain gardens within landscaped areas, along parking area perimeters, and between parking stalls will remove pollutants and sediments from stormwater runoff before it discharges into Hood Canal.

Action: *Increase tree cover over all parking areas to reduce surface run-off.*

Increasing forest canopy within Twanoh State Park will increase the amount of evapotranspiration that occurs within the watershed, and reduce the amount of precipitation that falls to ground and becomes run-off. Planting more trees around and within the parking area can increase rainwater interception and reduce the amount of rainfall that needs to be managed.



*Parking areas where forest canopy could be increased*

**Strategy 2: Treat stormwater run-off before discharge to the Sound.**

Action: *Incorporate low-impact development elements (e.g. infiltration trenches, bioswales, and rain gardens).*

Low-impact development elements can be used in between parking stalls and along the perimeter of the parking areas and roadways to collect and treat stormwater runoff which contains sediments, metals, and oils from the cars and trucks that visit the park. Since all low-impact development elements improve water quality, they should be incorporated throughout the Park, regardless of whether the stormwater is discharging into the creek, Hood Canal, or a piped conveyance system.



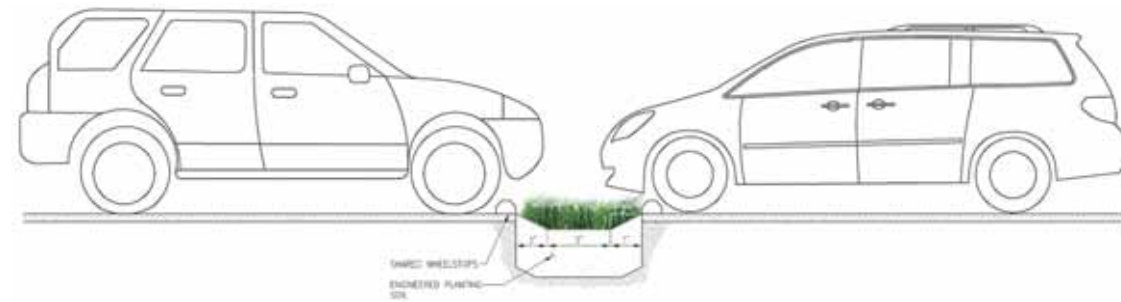
*Roadway within Twanoh State Park*



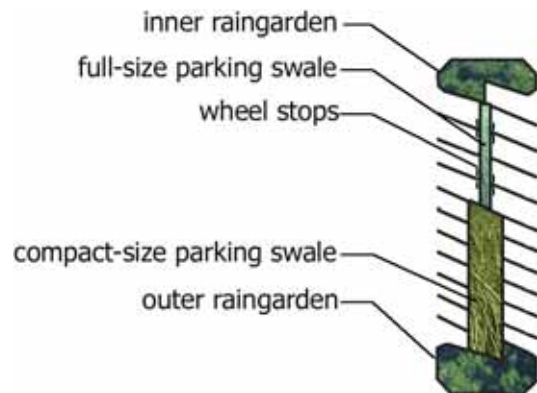
Roadway within Twanoh with roadside swale

Action: *Increase vegetation buffer between parking areas and water bodies to filter stormwater.*

Stormwater runoff, especially in the upland campground area, can cause erosion and pollution in Twanoh Creek. Increasing the vegetation buffer between the camping areas and the creek will stabilize the adjacent stream bank and reduce bank erosion. Native plantings will slow down the stormwater runoff and filter out pollutants and sediments.



Potential cross section for swales in parking areas



Configuration of rain gardens and swales in parking areas

Action: *Treat water from shoreline parking lots and roadways using bioremediation methods (e.g., bioswales).*

Bioremediation methods use the biological and chemical processes of plants and soil microbes to remove pollutants from stormwater. Bioretention methods retain pollutants and sediment within an area, allowing bioremediation methods to be more effective. Bioremediation and bioretention methods can be incorporated into rain gardens, swales, and other low-impact development elements in order to improve the quality of collected stormwater runoff.

**Strategy 3: Improve effectiveness of water use and wastewater treatment.**

Action: *Implement water conservation measures, e.g., waterless urinals and water-efficient fixtures.*

As comfort stations are upgraded and rebuilt, waterless urinals and water efficient fixtures can be installed to conserve water and reduce the wastewater that is pumped to the drain field in the park's upper area. Water-efficient fixtures, especially showers and toilets, can substantially reduce water use in the busy summer months.



Existing comfort station at Twanoh

Action: *Add facilities that can use greywater for irrigation.*

Water from outdoor wash off areas and showers near the shoreline can be used to irrigate planting areas. Drains from wash off areas can be connected to underground irrigation pipes that water the planting areas' root zones. Diversion of greywater into irrigation will also reduce the amount of wastewater that is pumped to the drain field in the Park's upper area.

Action: *Construct pre-treatment wetland as part of the wastewater treatment chain (polishing). Highlight this demonstration project to the public.*

In addition to the newly constructed drain field, Washington State Parks should consider constructing a pre-treatment wetland. Vegetation planted in gravel would be installed to create biological processes through which plants and microbes will reduce the nutrient levels in the wastewater before it enters the drain field and infiltrates into the ground.

This action is specifically valuable if the campground is replaced in the upper area of the park, and an interpretive trail is constructed that incorporates a pre-treatment wetland as an interpretive element.

The pre-treatment wetland could be a powerful demonstration project for Park users and nearby residents who have drain fields along Hood Canal. Such wetlands are easy to install on residential property. Getting local homeowners to install pre-treatment wetlands could provide additional nutrient removal for the wastewater that ultimately filters into Hood Canal.



Existing boat launch area at Twanoh



Existing limited vegetation along between parking area and shoreline



Existing riparian condition along Twanoh Creek

**Strategy 4: Reduce, treat, and/or eliminate sources of toxic chemical pollutants (e.g., pesticides, fertilizers, gasoline, creosote, detergents).**

Action: *Designate boat rinse-off area.*

Many visitors visit Twanoh State Park to use the boat launch. Many visitors and local residents come to the park to use the boat launch. Boaters often rinse off their boats at home to remove salt and dirt, and this activity contributes to stormwater pollution. State Parks could build a centralized facility for boat washing that would collect the rinse water and either treat it or hold it until it could be pumped elsewhere. This strategy would reduce stormwater impacts to Puget Sound resulting from conventional boat rinsing practices.

Washington State Parks could build a specific area for boat washing that would collect the rinse water and either treat it or hold it until it could be pumped out of the facility.

Action: *Eliminate use of cleaning chemicals (e.g., restroom maintenance).*

Reducing the use of hazardous cleaning products that are used to clean the parks buildings and facilities can reduce the impacts of pollutants in wastewater. Toxic chemicals can harm not only the environment but parks staff and visitors as well.

Action: *Create more natural filtration systems, e.g., oyster beds and vegetative buffers to help improve Puget Sound water quality.*

This action entails expanding the distribution of habitat resources that also act as natural filtration systems that would help improve water quality. Vegetative buffers and marsh vegetation help slow the transport of water into the sound and effectively act as sponges in the uptake of contaminants. Oysters are filter feeders that clean the water. These shellfish filter large volumes of water and can significantly influence water quality.

**Strategy 5: Reduce erosion and fine sediment loads in streams and other water bodies.**

Action: *Discuss road design opportunities with WSDOT to incorporate Sound-Friendly ideas.*

Washington State Highway 106 bisects Twanoh State Park. Stormwater runoff from the highway is currently not controlled or treated before discharge into Twanoh Creek and Hood Canal. Any highway redevelopment will have to meet current Washington State stormwater management standards. State Parks should work with WSDOT to coordinate highway and Park stormwater management facilities if the highway through the Park is redeveloped.

Action: *Control pedestrian access to specific areas of the creek edge while protecting other sensitive creek areas.*

Vegetation along Twanoh Creek provides nutrients and food for stream organisms, as well as shade, which helps regulate the stream's temperature. Providing park visitors with controlled access and view points along and over Twanoh Creek will allow the park to better manage the riparian corridor and restore vegetation where previous pedestrian access has degraded the stream bank.

Action: *Move camping and other high-impact uses away from creek edge.*

Camping and trails along the riparian corridor draw park users to the streambed. Clustering campground spaces closer together and further away from the creek will reduce campers' impact on Twanoh Creek, as will re-establishing the creek's riparian vegetative buffer. Park users should be guided to points along the stream bank where it is appropriate to be in the stream.

Action: *Acquire adjacent property or easements in upper watershed and restore forest cover.*

Some of the upland areas of Twanoh Creek Basin are owned by a private timber company and are not within the park's current boundary. Washington State Parks should include this property in its long-term property acquisition plan and revegetation plan. In addition, there are opportunities to create a connection between Twanoh State Park and a proposed Mason County trail system.

**Strategy 6: Improve water quality education.**

Action: *Provide hydrology interpretation.*

Signage about the Twanoh Creek Basin that discusses upland and shoreline hydrology should be located throughout the park along the trail system and stream.

Action: *Model low-impact development and watershed health. Demonstrate upstream stormwater impacts to the park and ecosystem.*

The park's low-impact development elements should demonstrate practices that residents and businesses can easily use on their own properties, such as reducing impervious surfaces and installing rain gardens. For example, State Parks could install demonstration rain gardens within the Park with interpretive signage that describes the stormwater management process and the benefit to Hood Canal. The park could provide visitors with diagrams and instructions on how to install similar rain gardens on their own properties.

Action: *Provide signage that explains the new wastewater treatment system*

Because Twanoh State Park was closed for the last year due to the failure of its wastewater system, signage about the new wastewater treatment facility should explain the reason for the closure, as well as the new system's benefit to Twanoh Creek and Hood Canal.

Action: *Partner with citizen scientists engaged in monitoring.*

There are many community groups who are interested in the health of Hood Canal. Schoolchildren and community members could be engaged to help monitor the benefits of the park's new stormwater management practices, such as through water quality sampling initiatives along the shoreline and within Twanoh Creek.

Action: *Provide demonstration rain garden on existing downspouts.*

The park could install demonstration rain gardens and provide visitors with diagrams and instructions on how to install similar rain gardens on their own properties. A series of rain gardens in the residential neighborhoods surrounding the park would be easy for homeowners to install and could reduce high flows into Hood Canal.

The demonstration rain gardens should be placed in high use areas within the park, such as existing comfort stations and administration buildings. Impacts to the historic landscape would need to be evaluated to determine the appropriate application of this action

Action: *Provide interpretive information about how Twanoh State Park is leading efforts to eliminate pollutants in maintenance and operation practices.*

The park's maintenance practices can easily be transferred over to residential and business applications. Using environmentally friendly cleaning products and maintenance practices will contribute to cleaning up Hood Canal. Providing interpretive signage regarding these practices will encourage park visitors and local residents and businesses to implement these practices on their own properties.

Action: *Provide interpretive information about Sound-Friendly boat washing.*

If Washington State Parks decides to install a boat rinsing facility, interpretive signage should be installed to let users know how the park is managing boat wash runoff and why it is important for the health of Hood Canal.

## GOAL 2

### HEALTHY WATER QUANTITY: Address water quantity (e.g., flooding, sea level rise)

Global warming is changing weather patterns, causing higher temperatures, rising sea levels, and more frequent severe storm events. The sea level rise predicted for the Seattle area is 2.8 feet by the year 2100 (UW Climate Impacts Group website). Different amounts of sea level rise will occur in different locations around Puget Sound, based on several factors including tectonic activity, such as subsidence and uplift (Puget Sound Action Team, 2005). To preserve the precious shoreline access in Washington, State Parks must take measures to preserve the facilities and natural amenities within Twanoh State Park.

#### Strategy 1: Identify areas and facilities at risk of sea level rise and re-design or re-locate them.

Action: *Prepare for sea-level rise by moving programmed spaces to higher ground and replacing with natural beach materials/slopes and less-intensive programming that can move with sea level changes.*

This action entails mapping the extent of the projected rise (between two to three feet) in mean sea level, accounting for storm and high tide events, and moving facilities at risk of damage, such as buildings and emergency access routes, out of these areas. It is recommended that relocation occur in a phased approach where facilities at most immediate risk (affected currently or within 25 years) would be addressed first, facilities at risk in 25 to 50 years second, etc.

The impact of the sea-level rise on Twanoh State Park could be modeled graphically to communicate the anticipated shoreline changes.

Action: *Protect existing historical structures by relocating them away from the stream and the shoreline.*

Depending on the extent of sea level rise, historic structures may need to be protected by moving them out of flood zones. Effects to the historic resources and landscape would need to be evaluated prior to determining the best course of action for protecting these historic structures.



*Existing campsite along Twanoh Creek*

**Strategy 2: Address watershed-wide hydrology.**

Action: *Acquire adjacent property in upper watershed and restore forest cover.*

Washington State Parks should seek to acquire the entire creek basin in order to ensure protection of the watershed's upland areas. For example, reforesting the entire basin would reduce current erosion along the trails near the Park's upper boundary. Creating a forest canopy with a diversity of mature and younger vegetation would preserve the riparian corridor's longevity and improve shoreline health.

Action: *Protect and restore sediment sources in watershed and within drift cell.*

The park provides the only unarmored shorelines in the drift cells it occurs within. Protection of these park shorelines and removal of riprap along other portions of the park shoreline would protect and restore the park's contribution to sediment supply and transport processes.

**Strategy 3: Manage floodplain to accommodate high flows within the park.**

Action: *Relocate developed park facilities outside/above Twanoh Creek floodplain.*

Action: *Allow for channel migration in floodplain by relocating adjacent campsites.*

Relocating campsites that are adjacent to Twanoh Creek would provide a wider area for the creek to meander and connect with its floodplain. Widening the creek corridor to restore natural stream meander will increase habitat by making the creek longer and enhance habitat quality by restoring processes leading to added beneficial instream habitat structure.

Action: *Increase riparian vegetative buffer along creek*

Increasing buffer vegetation along the stream will contribute more beneficial nutrients and organic matter to the stream, prevent erosion, reduce sediment loading, increase shade in the riparian corridor, and increase riparian habitat and improve in-stream habitat.

**Strategy 4: Improve water quantity education.**

Action: *Interpret human impacts on upland and estuary environment.*

State Parks has the opportunity to educate the park users on how development along shorelines affects the health of the watershed. Cutting down trees and building lawns, roads, and houses changes the way that water moves over the land. Incorporating these interpretive elements with a campaign to increase Twanoh State Park to include the entire creek basin will be a great opportunity to connect current events at the park with the health of Hood Canal.

Action: *Create demonstration low-impact development elements that are replicable for residents and businesses.*

As low-impact development elements are added to Twanoh State Park, the park can educate the park users on the reasons for the changes to park as well as the benefits to Hood Canal. Low-impact development options, including reducing impervious surfaces and disconnecting roof downspouts from stormwater pipes, are simple ways to improve the hydrology in residential and commercial applications.

**GOAL 3**

**HEALTHY HABITAT: Create healthy habitat and populations of fish and wildlife species**

Twanoh State Park contains a diverse range of aquatic and terrestrial habitats whose function for fish and wildlife species can be significantly enhanced through a variety of actions. Twanoh Creek is a salmon-bearing stream that flows through the park before entering into Puget Sound. The in-water and riparian habitats along the creek's route and Puget Sound marine nearshore offer opportunities to improve the quality and quantity of habitat for the park's fish and wildlife species. The park's shoreline also contains the only "soft" (not bulkheaded) beaches within the drift cells east and west of the park.

**Strategy 1: Protect and restore natural shoreline and marine nearshore processes.**

Action: *Protect and restore sediment sources in watershed and within drift cell.*

The park provides the only unarmored shorelines in the drift cells it occurs within. Protection of these park shorelines and removal of riprap along other portions of the park shoreline would protect and restore the park's contribution to sediment supply and transport processes.

Action: *Bridge intertidal beach with an elevated boat launching ramp that allows sediment to pass below.*

The park's boat ramp currently forms a solid structure that extends into the intertidal zone and impedes sediment movement along the shoreline. Replacing the concrete foundation and fill with an elevated structure over the intertidal zone would allow sediment to move freely and would not impact the ramp's capacity. There are examples around Puget Sound of how to successfully design an elevated ramp.



Example of bridged boat ramp to prevent interruption of sediment transport. Source: D. Small, WDFW



Lagoon with extensive marsh



Example of replanted marsh vegetation along widened estuary

Action: *Remove shoreline riprap and fill prism for shoreline parking/lawn area to restore natural beach slope and substrate.*

The riprap revetment and fill material used to form the parking areas along the shoreline reduce the amount of high functioning intertidal habitat. These structures also alter important habitat forming and sustaining processes such as sediment input, sediment transport, and energy dissipation.

This action would remove the riprap revetment and fill material to create a natural beach. The natural beach would have beach slopes identical to those found in nearby unmodified shorelines and a mix of sand, gravel, and cobble substrates. A natural beach would also recruit large drift logs into the high intertidal and backshore areas. The restored beach would provide improved migratory and rearing conditions for juvenile salmon and high intertidal spawning habitat for surf smelt, an important prey item for juvenile salmon and other fishes. Shorebirds would also benefit from the added intertidal areas habitat and associated prey resources.

Action: *Restore lagoon to an estuarine tidal marsh in the vicinity of wading pool and provide direct connection to Hood Canal.*

This action would restore a lagoon that existed historically at the park. The lagoon would be restored by removing the wading pool and opening the lagoon mouth near the point. Lagoons support marsh vegetation and provide high functioning rearing habitats for juvenile salmon. Evaluation of the impacts to this historic landscape feature would need to be documented to determine the appropriateness of this action in the context of the park's historic landscape.

Action: *Redesign pier and floats to meet new aquatic habitat guidelines.*

The dock and floats would be redesigned to provide more light penetration into the water. The added light would improve conditions supporting macroalgae growth and reduce potential behavior impacts on fish movements under the structures.

## Strategy 2: Protect and restore freshwater systems.

Action: *Widen creek mouth to form an estuary.*

The riprap bounding both banks of the creek narrows the creek mouth and impairs its function. Removing the riprap to expand the creek mouth would allow creek flows to disperse more widely across the delta and provide a broader area over which salinities transition from freshwater to saltwater. This is beneficial for juvenile salmon outmigrating from Twanoh Creek as the transition between these habitats is physiologically demanding.

In addition, the expanded estuary would support a larger and more diverse estuarine community of plants and animals. The expanded creek mouth would provide additional habitat to support marsh vegetation. Marsh vegetation provides high-functioning habitat for juvenile salmon by providing structure and cover as well as contributing to the food base supporting the fish.

Action: *Add instream habitat structures, such as large woody debris, to create more pools and riffles for fish.*

This action can provide immediate improvements to instream habitat structure in Twanoh Creek. A series of engineered log jams could provide pools that would provide habitat for juvenile salmon and reduce stream velocities which would allow more gravel and cobble substrate to remain in the creek for spawning salmon. The added habitat structure could improve habitat until more natural large wood recruitment processes, such as those through enhanced riparian vegetation (Strategy 3), begin to provide wood.

Action: *Allow natural stream meanders within defined floodplain.*

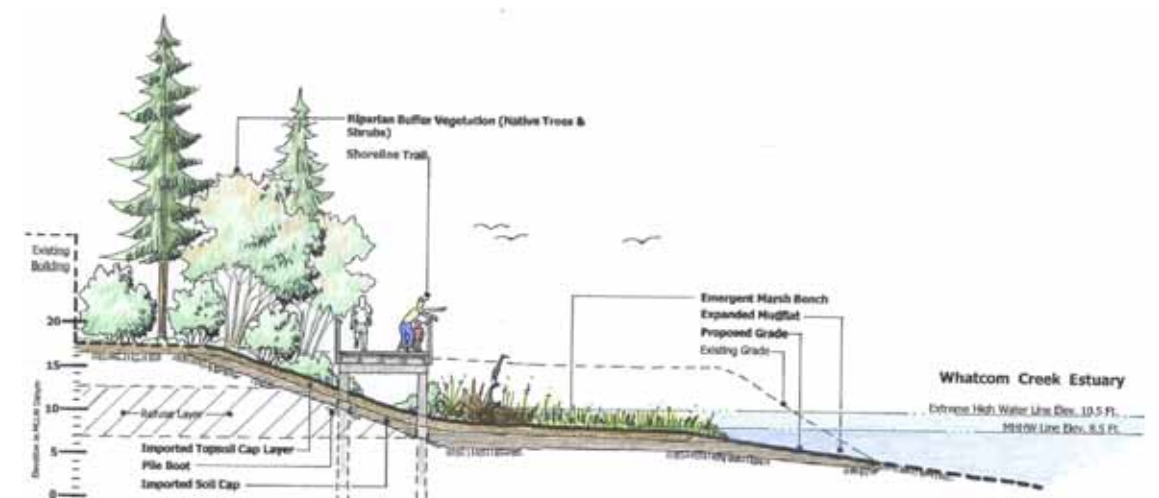
Remove or pull back the bank armoring that occurs along Twanoh Creek. Widening the creek corridor to restore natural stream meander will add habitat by making the creek longer and enhance habitat quality by restoring processes leading to added beneficial instream habitat structure. The addition of instream habitat structure could be accelerated through the action described below that entails adding log jams.

Action: *Move adjacent campsites to enhance and increase large stream meander and vegetative buffers.*

Provide more space for stream and riparian habitat improvements by creating more separation between camping areas and Twanoh Creek. This would be particularly beneficial to stream habitat function because the additional space would allow the stream to meander and support wider vegetative buffers.



Added large woody debris in stream



Example of restored beach shoreline

**Strategy 3: Protect and restore native plant communities.**

Action: *Restore riparian buffer with native species.*

Restoring the riparian buffer with native species will enhance the habitat and water quality of the creek. Native riparian vegetation can provide shade, slow stormwater run-off, and contribute organic matter to fuel the base of the food web. With time, the vegetation can also provide small and large woody debris to form instream habitat structure.

Action: *Restore estuarine marsh formation at creek mouth.*

The removal of riprap at the mouth of Twanoh Creek creates habitat to support additional estuarine marsh than is currently growing there. Marsh vegetation would provide high functioning habitat for juvenile salmon by providing structure and cover, as well as supporting a community of macroinvertebrate prey for salmon and contributing organic matter to support the base of the food web.

Action: *Plant native species in campground to replenish understory and provide bird habitat.*

Control trampling of vegetation by directing visitor access to designated viewpoints and trails. Reduce cutting or removal of native vegetation within the campground. Replenish understory native vegetation throughout the campground area as needed. This enhanced understory would provide habitat for birds and help reduce surface stormwater runoff.

Action: *Restore upper intertidal beach and backshore if rock armoring and parking is removed or relocated.*

The removal of riprap and fill material associated with removing or relocating the parking area would allow for restoration of the upper intertidal beach and backshore. The restored beach would have natural beach slopes and contain a mix of sand, gravel, and cobble substrates. The natural beach would also recruit large drift logs to the beach and provide backshore habitat to support native beachgrass.

The restored beach would provide improved migratory and rearing conditions for juvenile salmon and high intertidal spawning habitat for surf smelt, an important prey item for juvenile salmon and other fishes. Shorebirds would also benefit from the added intertidal areas habitat and associated prey resources. Restoring the upper beach and removing rock armoring also makes the shoreline more accessible for recreation.

Action: *Promote forest duff contribution, allowing organic matter to accumulate on forest floor, especially in the campground area.*

Leaf litter accumulation on the forest floor in the campground will support the production of rich soil and the inputs of organic material into the stream system.

**Strategy 4: Enhance native fish and wildlife species/communities.**

Action: *Re-establish native Olympia oysters.*

The intertidal and shallow subtidal habitats of the park could support native Olympia oysters. Currently, the park is seeded with non-native Pacific oysters.

Action: *Restore sand lance and surf smelt spawning habitat in restored beach mid to upper intertidal beach areas.*

The removal of riprap described in Goal 3, Strategy 1, would provide important spawning habitat for forage fish. Forage fish are major prey items for juvenile salmon. These fish spawn in sand and gravel in the upper intertidal zone. Currently the riprap shoreline between the boat ramp and the point does not provide suitable spawning habitat for forage fish. The removal of riprap and the restoration of a natural beach would support forage fish spawning.

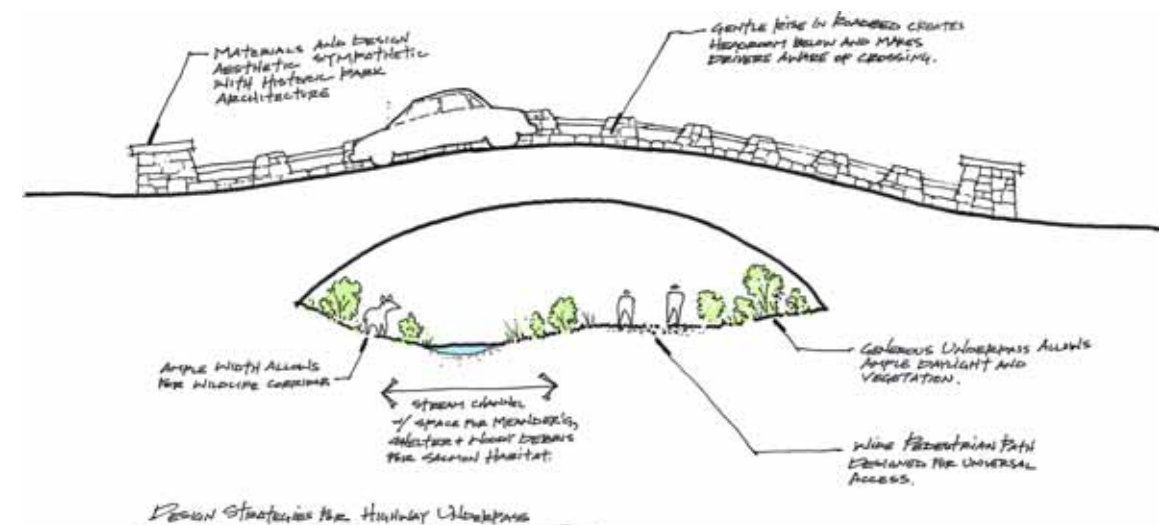
Action: *Restore plant species to enhance bird habitat in uplands and at estuary.*

The addition of understory native plants and marsh vegetation would provide habitat for birds, including shorebirds.

**Strategy 5: Identify and reconnect fish and wildlife habitat connectivity.**

Action: *Reconfigure campsites to allow for wider corridor of native riparian vegetation along creek.*

This action would provide more space for stream and riparian habitat improvements by creating more separation between camping areas and Twanoh Creek. Restoring a wider riparian corridor of native species will enhance fish and bird habitat as well as re-establish a vegetated corridor connecting the upstream park habitats with the downstream park habitats.



Wildlife undercrossings can include creek passage and pedestrian access

Action: *Protect watershed from fragmentation caused by road-building, land-clearing, and residential development through land acquisition.*

Acquire or protect watershed lands to prevent habitat modification in the undeveloped, but partially logged, Twanoh Creek watershed. Acquisition of additional property in the watershed would protect the Twanoh watershed by preventing future development. The concept of expanding the protected land ownership to include the entire watershed could be a model for park habitat stewardship, and would help educate visitors on how their actions impact the watershed.

The recent logging of the upper watershed may present a good opportunity to acquire the property. The current owner, Green Diamond Company, may be willing to sell the land at this time since it is likely several years away from generating additional revenue for the company.

Action: *Provide a wildlife crossing structure under Highway 106 that also serves as a safe pedestrian trail.*

A crossing under Highway 106 would enhance the ability of wildlife to move from the upper park areas to the lower park areas. Such a crossing could also serve as a safer pedestrian crossing than is currently in place.

**Strategy 6: Improve public education and interface with fish, wildlife, streams, and critical habitats.**

Action: *Provide education on habitat processes.*

Interpretation and education should accompany each habitat restoration component of improvements to the park. Education in the form of volunteer restoration training, bird watching groups, ecology talks led by park staff and interpretive signs would provide a solid base of knowledge for park visitors, improving their stewardship of restored habitat areas.

Action: *Provide boardwalk with adequate span across creek/expanded delta.*

Replace the existing pedestrian bridge with a wood boardwalk/bridge that spans the flood zone of the creek. Designers should ensure the location of the bridge is far enough away from the restored delta/mouth of the creek to avoid impairing critical habitat, but close enough so that visitors can observe salmon migrating and other wildlife using the creek mouth. The deck of the boardwalk/bridge should let light in (using a grill or grate) so that plants can grow along the banks underneath the bridge. Potential impacts to the cultural landscape would need to be evaluated.

Action: *Work with adjacent landowners to manage public access to natural systems.*

Adjacent landowners can form a stewardship group to both monitor public activity along the network of trails and identify areas needing attention (e.g., eroded banks). The landowners may want to connect adjacent land to trails in the park, or to keep public park users away from their land. Either way, landowners can work to ensure the public avoids sensitive areas and does not impact wildlife habitat.

*Sq Wuq Wa'63sh*  
Meaning "people of the river" in Coastal Salish

**GOAL 4**

**HEALTHY PEOPLE: Promote diverse community and recreational opportunities that enhance Puget Sound health**

Integral to the continued health of Twanoh State Park is the health of the people who visit and live in the area. This communal health takes two forms: the physical health of the visitors enhanced by the parks recreational facilities, and a human connection or stewardship of the park where local residents take ownership of the park's maintenance and success. Each of the preceding goals is critical to the health of Puget Sound but will not be successful without community support, volunteering, and stewardship. Key community members, such as neighboring residents, adjacent landowners, the Skokomish Tribe, the City of Belfair, and local environmental organizations, must be included in guiding partnerships as the park improves.

**Strategy 1: Facilitate and encourage community connection to park.**

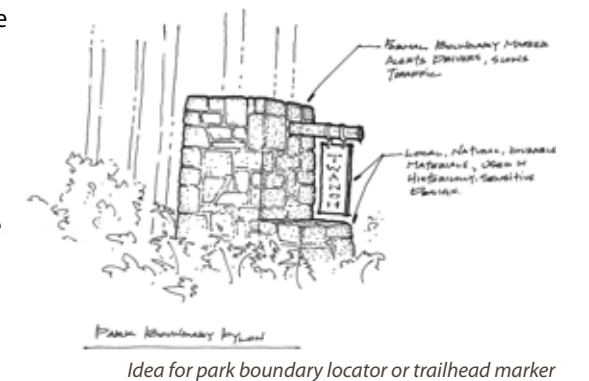
Action: *Collaborate with Skokomish Tribe.*

In planning for new features or remodeling of the existing park, State Park staff and consultants should collaborate with representatives of the Skokomish Tribe. The collaboration should include co-developing specific site design concepts using traditional knowledge and experience of place and implementing interpretive stories of the Skokomish people.

Action: *Use Coastal Salish language and interpretive messages on park signs.*

To increase awareness of the historical use of Twanoh State Park by the Skokomish, place text in the Coastal Salish language on interpretive and place name signs throughout the park.

Text should be provided by the Tribe's cultural preservation office.





Twanoh State Park has ideal facilities for outdoor recreation gatherings



The existing wading pool has water quality problems



Trails and highway crossing should be improved to be accessible to all visitors

Action: *Improve equipment and facilities to enhance visitor experience and potentially increase park revenue.*

The primary motivation for improving the park's equipment and facilities should be the visitor's experience, especially where the improvements would lead to increased visitation in the off-season and increased revenue generation. Fewer, quality facilities are preferred over a multitude of facilities that cannot be maintained.

Action: *Improve trailhead visibility, wayfinding, and cohesive trail system across County lines.*

The current trailhead to the extensive forest trail system is difficult for visitors to see and locate. By promoting trail use, we can increase visitor's immersive experience in the forest ecosystem that makes up the majority of the park, and draw some visitors away from the high-impact but sensitive shoreline. The trailhead and wayfinding could be improved in several ways:

- a. Increase the size of the trailhead by widening the opening and placing a bench or kiosk immediately inside the fence.
- b. Create a more dramatic entry with a rustic gate.
- c. Use small colored flags or signs to highlight different trail loops that feature a unique ecological learning opportunity, as part of the larger interpretive network.

The trail could be connected to regional trails in the County to extend the reach of the system and provide alternative means of arriving at the park. Impacts to the cultural landscape would need to be evaluated prior to redesigning the park's trail system.

Action: *Include local businesses, planners, and developers in planning process.*

Sound-Friendly strategies and practices should be shared with businesses and the local development community to maximize participation in the Sound-Friendly model across the entire watershed. Furthermore, these stakeholders' knowledge of local business practices, community values, and connections to real estate will lead to smoother implementation of green strategies in the park and may generate more creative ideas for revenue generation.

Action: *Increase year-round use of park by attracting visitors during the off-season with a variety of events and uses.*

To off-set the increased visitation in the summer, more efforts can be made to increase visitation in the winter by sponsoring outdoor-oriented events that make use of the State Park's facilities. The historic buildings can be rented out to local organizations. Fishing and shellfishing gatherings could make use of the shoreline area, while cultural outdoor events could occur under tents or in the structures. This would increase revenue and provide additional community connections with the park.

**Strategy 2: Promote active lifestyle.**

Action: *Provide universal access to all constituents (e.g., disabled, children, elderly) while protecting sensitive habitat areas and the park's cultural landscape.*

Ensure that trails, roads, and parking lots can meet the needs of all constituents who would like to enjoy the park. Accessibility should not interfere with ecological processes that occur within the park (e.g., paved trails should not be located in the riparian corridor).

Action: *Relocate kayak water trail site to central shoreline location in conjunction with rock riprap removal and beach restoration.*

Water trail sites have been proposed along the Hood Canal: pleasant places for kayakers to take their kayaks out of the water and picnic or use the facilities. Currently, Twanoh's water trail site is proposed for the beach to the south of the boat launch. Ideally, this area will be restored. The water trail site should be moved to the central beach area near the day use area of the park to better accommodate kayakers and immerse them in the park facilities.

**Strategy 3: Promote low-impact recreation and Sound-immersion park activities.**

Action: *Increase day usage area for passive recreation.*

Passive recreation, including walking, picnicking, and sunbathing, should also be encouraged by increasing the size of the picnicking area, the grassy lawn, and the playground equipment, where these facilities do not compromise the integrity of the park's forest and aquatic ecosystems, and cultural landscape.

Action: *Provide better access to shoreline by removing riprap.*

As part of the shoreline restoration effort, riprap will be removed. This provides an excellent opportunity to concentrate water/beach access in several accessible locations. Access should be at a low gradient without major debris in the way while maintaining the natural character of the beach.



Rip rap may prevent people from reaching the water



Indigenous people harvesting clams in Puget Sound



Volunteers planting trees along a stream bank

Action: *Engage diverse community or interest groups (e.g., kayakers, birders) with year-round events.*

Events and programs that focus on Sound-Friendly issues and strategies at Twanoh State Park can engage visitors with the Puget Sound in a low-impact way, teach them the value of Sound-Friendly mission, and promote greater appreciation of Twanoh State Park's unique fish, wildlife, habitat, and water resources. Year-round events such as salmon returns, shrimp fest, Salish Days, CCC-inspired events, could spread use at the park across the year, and enhance visitor enjoyment of the park during all seasons.

**Strategy 4: Promote community stewardship of park.**

Action: *Protect tribal fisheries and shellfish harvesting and promote traditional ecological knowledge and practices.*

Continue to protect tribal harvesting practices of oysters and clams at the State Park and educate visitors on traditional harvesting methods and tools.

Action: *Enhance existing stewardship programs at Twanoh State Park and strengthen partnership connections with other stewardship groups..*

Link activities and volunteer efforts at Twanoh State Park with the watershed steward program at the Theler Center in Belfair. Twanoh shore stewards can earn rewards for volunteering at the park and by applying green strategies found in the park at their businesses and residences. Shore stewards could also be local schoolchildren, and the current program of children from the Belfair School District doing environmental monitoring could be expanded.

Action: *Initiate a community mapping exercise to engage the park's neighbors in documenting the park values and resources.*

Engage the local community in several events or charrettes in which they map the landscape features of Twanoh State Park they consider most valuable. This community mapping exercise or series of exercises can be part of a broader green strategy design and implementation effort, so that people's ideas and values get translated into dynamic changes of the park.

Action: *Restore the park using volunteer work parties of kids or local organizations.*

Restoration of the aquatic, riparian or forest ecosystem should involve volunteers under the supervision of park staff. Volunteers can plant native vegetation, at a minimum, but can also spread mulch, salvage plants, and monitor restoration success. Active community involvement through volunteers leads to closer connections with the local community and more awareness of restored ecosystems.

**Strategy 5: Inform and educate public about park stewardship and Sound-Friendly recreational opportunities.**

Action: *Provide education opportunities to improve Hood Canal.*

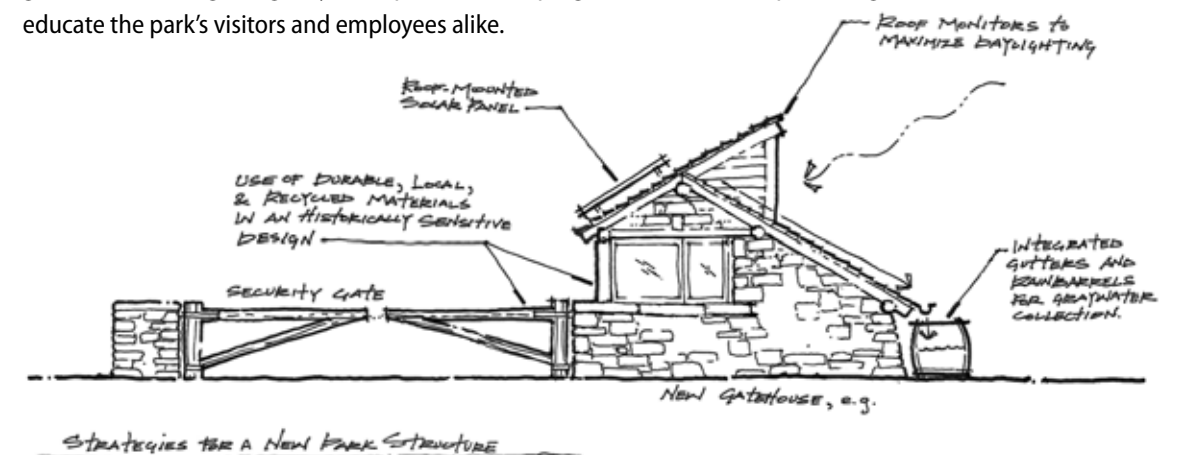
In the actions of Strategy 4, restoration, community mapping, and stewardship program that involve the community provide education and training for participants in which Sound-Friendly practices are shown and demonstrated. Ideally, education about park stewardship is participatory within the framework of a green landscape; that is, the ecological processes of the park are visible and interactive. One educational message is that visitors can learn lessons from the past by contrasting early park design and management practices with Sound-Friendly strategies.

Action: *Inform and educate campers about Sound-Friendly ideas and Twanoh application.*

Education and training can be a part of campfire programs and large gatherings and events. Develop a "Sound-Friendly campers" program for the parks system that could educate this major user group. Visitors who become knowledgeable in Sound-Friendly camping practices can disseminate Sound-friendly ideas to other campers and campgrounds.

**GOAL 5**  
**HEALTHY STRUCTURES: Sustainable Design and Low-Impact Development**

Twanoh State Park is the home to a wide variety of structures, of both historic Depression-era and more recent construction, which comprise a valuable built infrastructure for both park recreation and maintenance. Each building offers a set of needs and opportunities in terms of its continued utility and contribution to the park's impact upon the health of the Puget Sound: for instance, some are threatened by rising sea levels due to global climate change, while others would greatly benefit from increased energy and water consumption efficiency. In addition to retrofitting existing buildings, there is the potential that new structures will be built to meet growing park needs in the coming years. The thoughtful design of this new architecture provides a fertile ground for creating an agency-wide precedent for progressive and low-impact design to both shelter and educate the park's visitors and employees alike.



Example of a new building that could be built with low-impact



Existing buildings, like this restroom, can be maintained sustainably

**Strategy 1: Promote energy-efficient and energy-producing design, and reduce resource and energy consumption.**

Action: *When adding new facilities, use renewable energy, green building practices, and gray water management.*

Design new structures to be highly energy-efficient. This can be achieved through a variety of measures, including ensuring a rigorous insulating standard for new construction that meets or exceeds LEED certification through the use of thermally-efficient glazing, generous wall, roof, and sub-grade insulation (e.g., using high density foam and minimization of air-infiltration around openings). Install highly-efficient mechanical systems, and consider the use of alternative systems such as heat pumps, heat exchangers, designs which utilize passive heating and cooling, and automated shutoffs and timers.

Thoughtful building siting, glazing, and shading design can maximize natural daylighting and winter heat gains in the structure while minimizing unwanted heat gain and glare in the summer months. Reconstructed buildings need to balance sustainable shading and retrofitting practices with the need to be historically sensitive and accurate in terms of the original structures' materials and location.

Design guidelines for creating new Sound-Friendly development within the park's cultural landscape context need to be developed before implementing this action.

Action: *Treat and maintain historic buildings and cultural landscapes.*

The CCC-era structures at Twanoh represent a significant cultural legacy and are living examples of historic sustainable design. These structures utilized locally-procured, natural materials, they have endured as well-loved and serviceable structures for almost 80 years, and they were sited sensitively in the landscape with respect to stream buffers and flood plains. They are embodied interpretive elements advocating the value of sustainable design; their care and maintenance represent more than simply investments in park infrastructure or historic preservation successes.

**Strategy 2: Use sustainably harvested, local, non-toxic materials and finishes in building design and maintenance.**

Action: *Use non-toxic, sustainable building materials in any remodel, new construction.*

Use safe and Sound-friendly materials and substances. For wood products, use locally-harvested or small diameter engineered products, and encourage the use of sustainably harvested Forest Steward Council (FSC) certified wood. Specify non-toxic architectural finishes such as low-VOC paints, and recycled content products wherever possible, such as in fly-ash concrete and recycled post-consumer steel products.

**Strategy 3: Site and design new park structures in a way that achieves the Sound-Friendly Vision.**

Action: *Apply LEED and other green design criteria.*

In addition to following LEED and Low-Impact Development guidelines for energy-efficient and Sound-friendly new construction, utilize thoughtful master-planning to preserve Park historical landscapes and structures as well as the local ecological health at a larger scale. Issues such as rising sea levels, damaged watershed health, endangered salmon habitat, excessive stormwater runoff, and surface water pollutants are all impacting the park currently.

The park could be redesigned to locate day-use and camping along the sensitive shore-side of the highway and parking and hiking on the valley-side, connected by a wide pedestrian- and wildlife-friendly underpass. Such a layout, with thoughtful use of materials and progressive utility implementation would be a valid approach to improve habitat and human connectivity.

**Strategy 4: Improve "green design" education.**

Action: *Decrease visitors' freshwater consumption, and interpret these practices where appropriate.*

The implementation of rain barrels and greywater recycling, low-flow and waterless urinals are all common ways to decrease fresh water use. Employ greywater rather than potable water for uses such as a new boat rinse station, and provide appropriate signage.

Action: *Use historic buildings as example of green structures that use local building materials.*

Through interpretive elements or as built examples, underscore the sustainable aspects of the historic structures (see Strategy 1, Action 2, for elaboration).

Action: *Interpret CCC building and historic development practices that enhance the park.*

Interpretation and education will be consistent with the environmental strategies described above (Goal 5, Strategy 1). The interpretive component may take the form of interpretive panels and signs around or inside the historic structures, informational meetings regarding the rental and current use of the structures, or workshops on sustainable and historic building techniques.