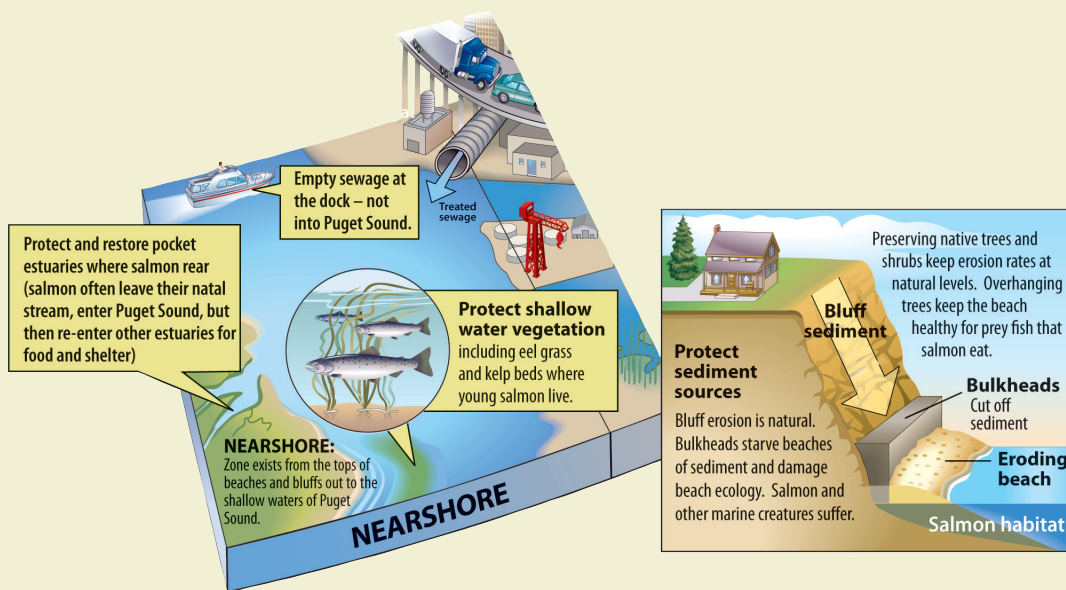


RECOMMENDED POLICIES AND ACTIONS FOR THE MARINE NEARSHORE SUBWATERSHED



The Marine Nearshore Subwatershed encompasses all the WRIA 9 shorelines of Puget Sound and streams that drain directly to Puget Sound. The mainland portion stretches from West Point in Seattle to the western boundary of the city of Federal Way. For salmon habitat planning purposes, Vashon/Maury Island is included in this subwatershed. Much of the shoreline has been modified to accommodate residential and commercial development. Residential (68%) and industrial (10%) development are the primary land uses on the mainland portion of the subwatershed. Residential development accounts for 92% of the land use on Vashon/Maury Island. Historic and current land use practices have degraded nearshore habitats, interrupted habitat-forming processes, degraded water and sediment quality, decreased riparian functions, and introduced non-native species. Some 80% of the mainland shoreline and 50% of the Vashon/Maury Island shoreline have some form of shoreline armoring (combined average of 64% is armored). The nearshore is critical to juvenile salmon for rearing, refuge from predators, transitioning to salt water habitats, and as a migration corridor to the Pacific Ocean. In a recent study, juvenile Chinook from at least 10 different Puget Sound stocks were identified in the marine waters of WRIA 9. Given that the

Duwamish Estuary is substantially degraded, it is likely that nearshore habitats have taken on more importance for juvenile Chinook rearing than they would have historically. (See Chapter 4 for a more detailed description of conditions in the Marine Nearshore Subwatershed.)

The following portfolio of policies and actions is designed to:

- Protect, restore, or rehabilitate:
 - Nearshore sediment transport processes by reconnecting sediment sources and removing shoreline armoring that impacts sediment transport;
 - Pocket estuaries (the mouths of smaller salmon-bearing and non-salmon bearing streams), lagoons, and spits; and
 - Sediment quality, particularly in Elliott Bay;
- Protect and expand forage fish spawning areas by maintaining/increasing high intertidal zone access and maintaining/increasing the availability of suitable substrate sizes; and
- Protect and increase the availability of vegetated shallow nearshore and marsh habitats.

(Continued)

POLICIES



PROGRAMS



PROJECTS



RECOMMENDED POLICIES AND ACTIONS FOR THE MARINE NEARSHORE SUBWATERSHED



The marine nearshore includes a number of pocket estuaries, such as Judd Creek on Vashon Island, which provide rearing habitat for juvenile salmonids. August 2004 photo.

While much is known about the ecology of the marine nearshore, there is relatively less information about salmonid habitat needs and project opportunities compared to the fresh water ecosystems in WRIA 9. At the time of publication of this Plan, there were two efforts underway that were expected to identify new projects and programs and help prioritize implementation of all marine nearshore actions, including those in this Plan. These consisted of:

- “Inventory and Assessment of Current and Historic Beach Feeding Sources/Erosion and Accretion Areas for WRIAs 8 and 9” (Johannessen and MacLennan 2005). This assessment was scheduled for completed by September 2005. In addition to classifying shoreline segments according to their sediment transport role, the study also will make habitat protection and restoration recommendations based on sediment transport processes.

- “Habitat Prioritization in Marine Nearshore Areas in Support of Juvenile Salmonid Growth and Survival in WRIA 9.” This project was scheduled for completion by December 2005. This study will incorporate geomorphic data from the Johannessen and MacLennan assessment (above), along with previously collected biological data to prioritize restoration and protection actions throughout the marine nearshore.

The prioritization and implementation projects in the marine nearshore in 2006 and beyond should incorporate the findings of these two studies. Future updates to the Plan should fully integrate these findings.

POLICIES



PROGRAMS



PROJECTS



Replace This Page with Figure 7-5

(See separate 11x17 file)

**Policy NS1:**

Encourage nearshore property owners to continue the replacement of creosote pilings and structures with non-creosote alternatives as well as the removal of obsolete/abandoned facilities that contain significant amounts of creosoted wood.

**Policy NS2:**

Encourage the Washington State Department of Ecology and the U.S. Coast Guard to update oil spill response plans as new habitat or oceanographic data becomes available.

**Policy NS3:**

Support the implementation of the Miller/Walker and Salmon Creek Basin Plan by the Cities of Burien and Normandy Park, King County, the Port of Seattle, and the Washington State Department of Transportation.

**Policy NS4:**

Encourage the fishery co-managers to consider the impacts on salmonids when establishing regulations for the harvest of forage fish (Pacific herring, surf smelt, and sand lance) throughout the WRIA.

**Policy NS5:**

Encourage the removal of derelict vessels.

**Policy NS6:**

Actively feed beaches, where appropriate, with sediment where there is a lack of sediment due to interrupted supply from bulkheads or other forms of shoreline armoring.

**Program N-1:*****Promote Habitat Restoration on Private Property by Offering a “Toolbox” of Nearshore Habitat Project Designs***

This program would promote voluntary restoration on private properties by creating a “toolbox” of stock or model habitat designs/techniques that can be applied to create needed habitats (e.g., removal of derelict docks, revegetation with riparian vegetation). Attention would focus on promotion of restoration when opportunities arise, particularly along feeder bluffs and pocket estuaries throughout the subwatershed.

Accompanying the “toolbox” would be technical assistance to landowners who lack funding and expertise to manage habitat restoration/ rehabilitation projects. Types of actions in the “toolbox” could include: removal of unneeded riprap and other armoring (bulkheads, groins, etc), removal of unneeded fill, removal of derelict pilings and derelict overwater structures, and restoration/rehabilitation of riparian vegetation.

Armoring and other structures are frequently in need of repair or replacement. However, some existing shoreline armoring was not in fact needed or was placed lower in the intertidal zone than is appropriate. Businesses and private property owners are more likely to consider allowing habitat restoration/rehabilitation on their property if doing so is easy to visualize and can be conducted with the least amount of site-specific design. (Standard models or templates for “soft” armoring are probably not worth creating due to the need to tailor such projects to site-specific conditions.)

Incentives may encourage private property owners to allow habitat improvements on private properties, possibly as part of site redevelopment.

Watershed basin stewards could promote the “toolbox” and provide or arrange for technical assistance for private property owners seeking to pursue good stewardship techniques. A starter list of smaller projects was compiled from projects evaluated by the Science Panel in 2004 and 2005. The majority of these smaller projects were originally identified in the draft report, “Inventory and Assessment of Current and Historic Beach Feeding Sources/Erosion and Accretion Areas for WRIAs 8 and 9” (Johannessen and MacLennan 2005). This list provides over 100 projects for this program to undertake once it is started. Implementation of any of these potential projects would depend on the voluntary participation of the property owner(s). The list of projects can be found in Volume II: Appendix G.

This program also could be applied to the lower few miles of the Duwamish given that habitat there is believed to function much like marine nearshore habitat.



Discouraging use of structures such as these groins on Vashon Island is a focus of this proposed program. September 2000 photo courtesy of Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Protecting and improving riparian vegetation (All-2)
- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and restoring nearshore sediment transport processes (Near-3)
- Protecting and expanding forage fish spawning areas (Near-4)
- Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)

Habitat Management Strategies

- Restore sediment recruitment and transport processes
- Restore shallow water habitats
- Restore/Rehabilitate riparian vegetation and buffers
- Restore/Rehabilitate hydrologic and sediment process
- Restore/Rehabilitate eelgrass and kelp beds by allowing natural processes to occur
- Restore/Rehabilitate beaches, backshore and associated plant communities
- Restore/Rehabilitate salt marshes
- Rehabilitate shoreline areas to reduce water quality impacts



Program N-2: *Create a Soft Armoring Technical Assistance and Cost-Share Program*



This beach was restored by removing rip rap armoring and replacing it with gravel. Photo courtesy of Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and restoring nearshore sediment transport processes (Near-3)
- Protecting and expanding forage fish spawning areas (Near-4)

Habitat Management Strategies

- Restore/Rehabilitate sediment recruitment and transport processes
- Restore/Rehabilitate shallow water habitats
- Restore/Rehabilitate riparian processes and functions
- Restore/Rehabilitate eelgrass and kelp beds by allowing natural processes to occur
- Restore/Rehabilitate beaches, backshore and associated plant communities
- Restore/Rehabilitate salt marshes
- Restore/Rehabilitate shoreline areas to reduce water quality impacts

This program would both offer technical assistance on alternative shoreline protection (“soft” armoring) and provide a cost-share program to encourage landowners to use these techniques.

Bulkhead removal is expensive and the unique nature of each site is not conducive to the use of standard models or templates of soft armoring. Consequently, encouraging use of soft armoring – when some form of beach protection is absolutely necessary — will require a personalized approach.

Many landowners and consultants are unfamiliar with how to undertake soft armoring approaches. Technical assistance will allow for these alternatives to be considered more often than at present, when the customary response is hard armoring.

Incentives should encourage private property owners to adopt “soft” armoring and/or the addition of habitat improvements as part of site development or redevelopment. The initial focus of this program would be on properties identified as altering sediment recruitment and transport processes or directly impacting marsh habitat or pocket estuaries.



Program N-3:

Create an Incentive Program to Encourage Multiple Family/Neighborhood Use of Docks and Boat Ramps

This program would reduce the impacts of docks and boat ramps by encouraging consolidation of several docks or ramps into one structure that would serve the entire community. Frequently, many shoreline houses adjacent to one another have their own boat ramps and/or over water structures such as docks. These structures have a variety of long-lived negative impacts including shading of submerged aquatic vegetation, interfering with sediment transport, and possibly altering salmonid migration.

This program could be instituted both for new construction proposals and for consolidating existing structures as they are repaired or redeveloped. The financial incentives could include government cost share, reduction in permit costs, tax reductions within the Public Benefit Rating System, and technical and legal assistance. Moreover, this program also could help landowners save money by spreading out the costs of creating and maintaining these structures.

Along with the financial incentives, it is necessary to create examples or templates of legal agreements for access to, maintenance of, and general rules of use of the structures. This would help communities understand how to share use of such facilities and help to relieve fears of misuse of the rules by a single party.

Major redevelopment or repair of older structures may result in further alterations to the shoreline. Where an incentive can be provided to the private-property owner or developer, it may result in a reduction in the overall impacts to a particular area of shoreline.



A program encouraging shared use of docks and boat ramps would help property owners in situations such as this where two boat ramps are less than 100 feet apart. September 2000 photo courtesy of Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Protecting against watershed and upland impacts (All-5)
- Preventing/removing armoring and fill (All-6) Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and restoring nearshore sediment transport processes (Near-3)
- Protecting and expanding forage fish spawning areas (Near-4)

Habitat Management Strategies

- Protect/Restore/Rehabilitate sediment recruitment and transport processes
- Protect/Restore/Rehabilitate shallow water habitats
- Protect/Restore/Rehabilitate riparian processes and functions
- Protect/Restore/Rehabilitate eelgrass and kelp beds by allowing natural processes to occur
- Protect/Restore/Rehabilitate beaches, backshore and associated plant communities
- Protect/Restore/Rehabilitate salt marshes
- Protect/Restore/Rehabilitate shoreline areas to reduce water quality impacts



Program N-4:

Create a Financial Incentive Program to Replace/Repair Failing Septic Systems on Vashon/Maury Islands within Quartermaster Harbor

Provide incentives to replace or repair those failing septic systems contributing to water quality problems in Quartermaster Harbor on Vashon/Maury Island.

Failing or inappropriately sited septic systems on Vashon/Maury Island are known to be a common problem. These failing systems have been associated with shellfish harvesting closures and other water quality concerns, especially within Quartermaster Harbor. While the direct impact on shellfish harvesting is a human health concern, the water quality impacts negatively affect various parts of the ecosystem that supports Chinook salmon. Currently, there is no financial incentive for property owners to repair or relocate septic systems as long as sewage is not backing up into the dwelling.

This program would create a financial incentive to fix problems through cost shares, education, and technical assistance. The program could supplement current efforts by the Puget Sound Action Team, such as the education program that uses “septic socials” in which property owners teach other property owners about proper septic system maintenance. Creating a cost share and technical assistance program will enhance the existing education program and be more likely to cause failing septic systems to be replaced.

Many properties on Vashon/Maury Island have limited sites suitable for septic systems. Some residents on Vashon/Maury Island have asked that the Washington State Department of Health and King County Department of Development and Environmental Services allow greater flexibility to take these physical constraints into account and thereby encourage people with failing systems to fix them sooner.

LINKAGES

Conservation Hypotheses Addressed

- *Protecting water quality (All-1)*
- *Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)*

Habitat Management Strategies

- *Protect/Restore water quality where state standards are being met or exceeded*
- *Protect/Restore eelgrass, kelp and other macroalgae*



Program N-5: Citizen Volunteer Forage Fish Monitoring Program

This program would both help to fill important data gaps about where forage fish spawn and educate the public — especially marine shoreline landowners — about the importance of a healthy nearshore.

Forage fish are at the base of the food chain, with many declining species in Puget Sound relying on them as a primary food source (including various salmonids, marine birds, marine mammals, and other fish). The Washington State Department of Fish and Wildlife currently protects all known forage fish spawning beaches.

The program would collect data on forage fish presence/absence, timing, species, use of different substrate types, and intertidal and upland habitat condition following protocols developed in other Puget Sound jurisdictions. Volunteers would be taught about forage fish ecology, beach morphology, and sediment transport process. They will be trained on how to sample for forage fish, characterize habitat conditions, and water safety. Results would be published via the web and on CD annually. Data structure would be constructed to be compatible with Washington State Department of Fish and Wildlife forage fish database and shared with the agency.

A number of citizens on Vashon/Maury Island have expressed interest in such a program. Its implementation would likely attract attention from non-participants and provide opportunities to convey messages about the importance of protecting and restoring a healthy marine nearshore.



Scientific assessment work provides opportunities to involve and inform the public. August 2001 photo.

LINKAGES



Conservation Hypotheses Addressed

- Protecting and expanding forage fish spawning areas (Near-4)



Habitat Management Strategies

- Protect beaches and backshore areas and associated plant communities



Project NS-1: **Pier 90 Shallow Water Habitat Rehabilitation**



Site of proposed project east of Pier 90. Galer Street Bridge over the BNSF Railway tracks has been constructed since photo was taken. September 2000 photo courtesy of the Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Protecting and improving riparian vegetation (All-2)
- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and expanding forage fish spawning areas (Near-4)

Habitat Management Strategies

- Protect/Restore shallow water habitats
- Restore riparian vegetation
- Restore beaches, backshore and associated plant communities

Project Description

There is currently a small amount of shallow water habitat along the eastern side of Pier 90 in Elliott Bay in Seattle. This project would protect and expand that area of shallow water habitat. The land comprising shoreline east of Pier 90 would need to be purchased. The riprap and fill would be moved in order to create additional shallow water habitat and the shoreline would be planted with riparian vegetation.

Opportunities and Constraints

- The road leading to Pier 90 would need to be relocated, as it is right along the shore and is heavily used.



Project NS-2:

Myrtle Edwards Park Small Pocket Beaches/Shallow Water Habitat Rehabilitation

Project Description

This project would create several pocket beaches in Myrtle Edwards Park on Elliott Bay in Seattle and to the north of the park. Riprap armoring would be removed and the slopes would be graded back to create natural slopes. Pocket beaches would have a fishmix (sand and gravel) of sediments placed on them. Some of the riparian area would be planted with native vegetation. A shallow water bench such as that described for Project NS-3 (below) may also be constructed waterward of the pocket beaches.

Opportunities and Constraints

- The project sites are popular, high-visibility parks owned by the City of Seattle and Port of Seattle.

LINKAGES

🔗 Conservation Hypotheses Addressed

- *Protecting and improving riparian vegetation (All-2)*
- *Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)*
- *Protecting and expanding forage fish spawning areas (Near-4)*

🔗 Habitat Management Strategies

- *Restore/Rehabilitate shallow water habitats*
- *Restore/Rehabilitate riparian vegetation*
- *Restore/Rehabilitate beaches, backshore and associated plant communities*



Project NS-3:

Olympic Sculpture Park Tidal Embayment/Shallow Water Habitat Rehabilitation



Site of proposed Olympic Sculpture Park restoration on Elliott Bay at south end of Myrtle Edwards Park. July 2004 photo.

LINKAGES

Conservation Hypotheses Addressed

- *Protecting and improving riparian vegetation (All-2)*
- *Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)*
- *Protecting and expanding forage fish spawning areas (Near-4)*

Habitat Management Strategies

- *Restore/Rehabilitate shallow water habitats*
- *Restore/Rehabilitate riparian vegetation*
- *Restore/Rehabilitate beaches, backshore and associated plant communities*

Project Description

This project would create a 0.64 acre tidal embayment at the northern end of the Elliott Bay seawall and an approximately 800 foot long and 15 foot wide habitat bench between Pier 70 and Myrtle Edwards Park. The habitat bench would be a 15 foot wide lower intertidal (0 to -1 foot mean lower low water) bench along approximately 770 feet of the buttress that will be added to re-enforce the seawall. The bench would be a combination of fish mix (sand and gravel) and larger cobbles to provide a setting to support algae growth and epibenthic/benthic invertebrate production. The outer face of the bench will slope to deeper depths and will provide boulder habitat for understory and over-story kelp colonization. The riparian area would be partially planted with native marine riparian vegetation.

Opportunities and Constraints

- This project already has the support of the City of Seattle, which owns Myrtle Edwards Park. It would be part of the larger Olympic Sculpture Park redevelopment currently underway. Its habitat value is complemented by its high visibility and contribution to public awareness.



Project NS-4: **Seattle Waterfront Shallow Water Bench Habitat Rehabilitation**

Project Description

This project is conceptual at this point but is based on the fact that the Seattle waterfront seawall and Alaskan Way viaduct may be replaced in the future. These replacements create a rare opportunity to turn the eastern Elliott Bay shoreline into a fish friendly environment. The project would involve creating shallow water habitat benches and fish friendly structures along the waterfront. This proposal also encompasses the relocation of the Washington State Ferry system's Colman Ferry Dock offshore, allowing room for installing a shoreline beach. These changes would open up a migration corridor and increase the amount of shallow water area for juvenile Chinook foraging.

Opportunities and Constraints

- The project depends on funding and construction of the Alaskan Way Viaduct replacement.
- Pier relocation would be required.



The central Seattle waterfront provides poor salmon habitat today. Seawall replacement offers opportunities to improve habitat value. July 2004 photo.

LINKAGES

Conservation Hypotheses Addressed

- Protecting and improving riparian vegetation (All-2)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and expanding forage fish spawning areas (Near-4)

Habitat Management Strategies

- Restore/Rehabilitate riparian vegetation
- Restore/Rehabilitate beaches, backshore and associated plant communities



Project NS-5:

Burien Seahurst Park Shoreline Restoration, Phase II



Southern portion of Seahurst Park following removal of a failing seawall and beach restoration (Phase I). February 2005 photo courtesy City of Burien.

LINKAGES

Conservation Hypotheses Addressed

- *Protecting and improving riparian vegetation (All-2)*
- *Preventing/removing armoring and fill (All-6)*
- *Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)*
- *Protecting and restoring nearshore sediment transport processes (Near-3)*
- *Protecting and expanding forage fish spawning areas (Near-4)*
- *Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)*

Habitat Management Strategies

- *Restore sediment recruitment and transport processes*
- *Restore shallow water habitats*
- *Restore riparian vegetation*
- *Restore beaches, backshore and associated plant communities*

Project Description

Continue shoreline restoration actions conducted in southern portion of Seahurst Park in Burien by removing shoreline armoring along approximately 3,000 feet of shoreline, restoring natural beach slopes, adding riparian vegetation, and connecting riparian vegetation and sediment supply to the aquatic portion of nearshore. This Phase II would add to the successful Phase I seawall removal/beach restoration conducted in 2004-2005.

Opportunities and Constraints

- The combined project (Phase I and II) would result in almost a mile of unarmored shoreline and be one of the largest contiguous lengths of unarmored shoreline within WRIA 9.



Project NS-6: ***Skeeter Creek Pocket Estuary Restoration on Vashon Island***

Project Description

This project would restore the mouth of Skeeter Creek on the northwestern side of Vashon Island. Currently the mouth is a four foot culvert through substantial fill and bulkheading at the top of the beach. The culvert appears to be a complete fish barrier. The project would remove the 15 foot tall bulkheading and restore a natural beach profile. It is likely that a portion of a driveway would need to be relocated.

Opportunities and Constraints

- This project depends on a voluntary cooperation with the existing property owner or purchase if the owner is willing to sell.



Skeeter Creek where it enters Colvos Passage on the west side of Vashon Island. September 2000 photo courtesy of the Washington Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Protecting and improving riparian vegetation (All-2)
- Improving tributary access (All-3)
- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)

Habitat Management Strategies

- Protect/Restore shallow water habitat
- Protect/Restore intact riparian areas and associated functions
- Protect/Restore tributary mouths
- Protect/Restore beaches and backshore and associated plant communities
- Protect/Restore salt marshes



Project NS-7: **Cove Creek Pocket Estuary Restoration on Vashon Island**



Cove Creek where it enters Colves Passage on the west side of Vashon Island. September 2000 photo courtesy of Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- *Protecting and improving riparian vegetation (All-2)*
- *Improving tributary access (All-3)*
- *Preventing/removing armoring and fill (All-6)*
- *Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)*
- *Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)*

Habitat Management Strategies

- *Protect/Restore shallow water habitat*
- *Protect/Restore intact riparian areas and associated functions*
- *Protect/Restore tributary mouths*
- *Protect/Restore beaches and backshore and associated plant communities*
- *Protect/Restore salt marshes*

Project Description

This project would restore the mouth of Cove Creek on the northwestern side of Vashon Island. Puget Sound Energy owns the property where Cove Creek enters Puget Sound through a bulkhead/culvert combination. King County owns the two parcels upstream. There is a road that leads to and ends at the Puget Sound Energy property. Since Puget Sound Energy would need the road to maintain the equipment on site, the bulkhead/culvert would be replaced with a box culvert and the road would be moved as far back from the shoreline as possible. It is also possible that a new road crossing could be built onto the Puget Sound Energy property off of the adjacent King County property. This would have the stream crossing occurring approximately 150 feet upstream of the mouth. The northern half of the bulkhead, which is not protecting any structures or road, would be removed. The stream mouth area would be planted with riparian and marsh vegetation.

Opportunities and Constraints

- The project depends on the cooperation of the Puget Sound Energy.



Project NS-8: *Dillworth and Gorsuch Creek Pocket Estuaries Restoration on Vashon Island*

Project Description

Dillworth and Gorsuch Creeks enter Puget Sound at nearly the same location, creating a single fan type delta on the northeastern shore of Vashon Island. The creek mouths are approximately 300 feet apart. Both streams are currently in constrained channels for the lower 150 feet. Both channels would have the bank armoring (both banks) removed and a meandering stream channel established. If the property were purchased, the northern property's house and bulk-head would be removed.

Opportunities and Constraints

- This project depends on the voluntary sale of one or two of the parcels by the property owners and the cooperation of neighboring property owners.
- Purchase of the two properties would make the project much easier and more sustainable by allowing the channels to move around the alluvial fan over time, but it is still possible to improve habitat conditions while retaining the existing buildings.



Gorsuch and Dillworth Creeks where they enter Puget Sound on the east side of Vashon Island. Photo courtesy of Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Protecting and improving riparian vegetation (All-2)
- Improving tributary access (All-3)
- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)

Habitat Management Strategies

- Protect/Restore shallow water habitat
- Protect/Restore intact riparian areas and associated functions
- Protect/Restore tributary mouths
- Protect/Restore beaches and backshore and associated plant communities
- Protect/Restore salt marshes



Project NS-9:

Mileta, Ellisport, Camp Sealh, Bates, and Tsugwalla Creek Fish Passage Improvements on Vashon Island



Mouth of Tsugwalla Creek showing fish passage blockage. June 2000 photo courtesy of Washington Trout.

LINKAGES

Conservation Hypotheses Addressed

- Improving tributary access (All-3)
- Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)

Habitat Management Strategies

- Restore access to tributaries
- Restore pocket estuaries

Project Description

This project would restore fish passage to five streams on Vashon Island by replacing existing culverts with improved culverts or bridges. The streams are Mileta, Ellisport, Camp Sealh, Bates, and Tsugwalla Creeks. Restoring fish passage at these locations was evaluated as having likely direct Chinook benefit by opening up currently inaccessible habitat to serve as pocket estuaries. These fish passage blockages were confirmed in the 2000/2001 Washington Trout field survey of passage blockages across Vashon/Maury Island.

Opportunities and Constraints

- This project depends on voluntary cooperation of private property owners.



Project NS-10: ***Ellis Creek Saltmarsh Protection and Restoration on Vashon Island***

Project Description

This project would acquire the salmonid-accessible saltmarsh and riparian land at the mouth of Ellis Creek on Tramp Harbor, on the east side of Vashon Island.

There is currently a functioning saltmarsh that is constrained in size by a dirt road that gives access to five privately-owned parcels. The five parcels comprise four acres of upland and saltmarsh habitat. The project would remove the dirt access road, increasing the total saltmarsh area by approximately 33%.

Purchase (if the property owners are willing to sell) is required because removal of the access road would preclude use of the upland parcels.

The newly opened area would be evaluated in the future to determine if active restoration of the plant community is needed or whether passive restoration will suffice to restore the saltmarsh community.

Opportunities and Constraints

- This project depends on the voluntary sale of the parcels by the property owners.



Ellis Creek mouth. September 2000 photo courtesy of the Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- *Protecting and improving riparian vegetation (All-2)*
- *Improving tributary access (All-3) Preventing/removing armoring and fill (All-6)*
- *Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)*
- *Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)*

Habitat Management Strategies

- *Protect/Restore shallow water habitat*
- *Protect/Restore intact riparian areas and associated functions*
- *Protect/Restore tributary mouths*
- *Protect/Restore beaches and backshore and associated plant communities*
- *Protect/Restore salt marshes*



Project NS-11:

Feeder Bluff Protection and Restoration of Beach Feeding Processes in Normandy Park



Undeveloped feeder bluffs that would be purchased. September 2000 photo courtesy of Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- *Protecting and improving riparian vegetation (All-2)*
- *Preventing/removing armoring and fill (All-6)*
- *Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)*
- *Protecting and restoring nearshore sediment transport processes (Near-3)*
- *Protecting and expanding forage fish spawning areas (Near-4)*

Habitat Management Strategies

- *Restore sediment recruitment and transport processes*
- *Restore shallow water habitatsRestore riparian vegetation*
- *Restore beaches, backshore and associated plant communities*

Project Description

This project would purchase and restore one of the last major privately-held undeveloped feeder bluffs along the mainland marine shoreline. The project is located just north of Marine View Park in Normandy Park. The bluff is approximately 1,000 feet long and is made up of 27 separate parcels, totaling 13.5 acres. Three of the 27 parcels are already in public ownership (two owned by King County and one by the City of Normandy Park). While the upland is not developed, there is a bulkhead along 80% of the shoreline of the bluff. Once the parcels are purchased, the bulkhead would be removed to allow for natural sediment beach feeding processes to occur.

Opportunities and Constraints

- This project depends on the voluntary sale of the parcels by property owners.



Project NS-12:

Pocket Estuary Restoration at Mouth of Unnamed Creek in Normandy Park

Project Description

This project would acquire two parcels, one on each side of the mouth of an unnamed creek just south of Marine View Park in Normandy Park. Each parcel has a house and bulkhead on it, which fill portions of the intertidal zone. The bulkheads and houses constrain the stream channel to an approximately four to five-foot wide cement walled channel. Once the parcels were purchased the houses and bulkheads would be removed, the slope would be regraded and revegetated. Marsh vegetation would be planted adjacent to the mouth.

Opportunities and Constraints

- This project depends on the voluntary sale of the parcels by property owners.



Unnamed creek flows between two houses in Normandy Park. September 2000 photo courtesy of Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Protecting and improving riparian vegetation (All-2)
- Improving tributary access (All-3)
- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)

Habitat Management Strategies

- Protect/Restore shallow water habitat
- Protect/Restore intact riparian areas and associated functions
- Protect/Restore tributary mouths
- Protect/Restore beaches and backshore and associated plant communities
- Protect/Restore salt marshes



Project NS-13: **Massey Creek Pocket Estuary Restoration in Des Moines**



Massey Creek empties into Puget Sound between two rock walls at top of photo. Project would remove small jetty to south (right). City of Des Moines Marina is to left. September 2000 photo courtesy of Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Protecting and improving riparian vegetation (All-2)
- Improving tributary access (All-3)
- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)

Habitat Management Strategies

- Protect/Restore shallow water habitat
- Protect/Restore tributary mouths
- Protect/Restore beaches and backshore and associated plant communities
- Protect/Restore salt marshes

Project Description

This project would involve restoring parts of the estuary of Massey Creek in Des Moines. Massey Creek enters Puget Sound just south of the Des Moines Marina. The project would remove 300 feet of the southern, rock-lined bank of the creek and a small jetty (about half of that distance is the jetty; the other half is the channelized stream). The 150-foot jetty extending out into the subtidal area would be removed (there is another jetty protecting the Des Moines Marina on the north side of the stream; this project does not propose changes to that jetty). Approximately 150 feet of the channel upstream of the mouth would be widened and meandered away from the northern rock wall to create two natural banks for the creek. The area on both sides of the creek would be revegetated with upland and marsh vegetation.

Opportunities and Constraints

- This project depends on either the voluntary cooperation of the current landowner or through a conservation easement on the western half of the property.



Project NS-14:

Evaluate How to Improve Habitat Value of Raab's Lagoon/Pocket Estuary on Maury Island

Project Description

This project would work with the property owner and people who moor boats in Raab's Lagoon to identify ways to improve its value in terms of salmon habitat.

Prior to the 1920's, Raab's Lagoon was a properly functioning subestuary on Quartermaster Harbor on Maury Island. A bulkhead was placed across the mouth to provide a road to Maury Island. Later, this bulkhead was partly removed and replaced with a water control structure that allowed for boat moorage in the lagoon.

This project would involve examination of the lagoon to determine whether and how it could be modified to improve habitat value for salmonids. This examination would require the participation of the property owner and those who moor boats in the lagoon to better understand how it is managed currently, the implication of any potential changes both to current users and the existing habitat, and ways to mitigate the harmful impacts of potential changes. Potential changes could range from modifications of the water control structure operations to restoration of full fish access and tidal inundation of the lagoon by removing the water control structure and reestablishing a sand spit across the mouth. If changes to the control structure increased salinity in the lagoon, salt marsh restoration could be undertaken where elevations are appropriate. The riparian area also could be planted.

Opportunities and Constraints

- This project depends on the voluntary cooperation by the property owner and lagoon neighbors. There is a high level of interest in and concern about this potential project among lagoon neighbors.



Raab's Lagoon on Maury Island. September 2000 photo courtesy of the Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Protecting and improving riparian vegetation (All-2)
- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and restoring nearshore sediment transport processes (Near-3)
- Protecting and expanding forage fish spawning areas (Near-4)
- Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)

Habitat Management Strategies

- Restore sediment recruitment and transport processesRestore shallow water habitats
- Restore riparian vegetation
- Restore salt marshes
- Protect/Restore/Rehabilitate beaches, backshore and associated plant communities



Project NS-15: **McSorley Creek Pocket Estuary Restoration in Des Moines**



McSorley Creek where it empties into Puget Sound at Saltwater State Park in Des Moines. September 2000 photo courtesy of Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- *Protecting and improving riparian vegetation (All-2)*
- *Improving tributary access (All-3)*
- *Preventing/removing armoring and fill (All-6)*
- *Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)*
- *Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)*

Habitat Management Strategies

- *Protect/Restore shallow water habitat*
- *Protect/Restore intact riparian areas and associated functions*
- *Protect/Restore tributary mouths*
- *Protect/Restore beaches and backshore and associated plant communities*
- *Protect/Restore salt marshes*

Project Description

This project would remove rock armoring along approximately 150 feet on both banks of McSorley Creek upstream from the mouth. McSorley Creek in Des Moines enters Puget Sound along a heavily modified shoreline at Saltwater State Park. The project would also remove all armoring along the marine shoreline within 150 on either side of the stream mouth. The beach fill would be excavated and the beach regraded to a natural slope (similar to the current southern shoreline beyond the existing 150 feet of armoring). The area adjacent to the mouth would be planted with dune grass and other native vegetation.

Opportunities and Constraints

- This project depends on the cooperation of Washington State Parks. The project would impact some of the park uses (three to five picnic and barbecue areas), while improving both the natural aesthetic values and ecological values of the site.
- The park and community uses the stream ecology and salmon runs on McSorley Creek as an educational tool.



Project NS-16: *Dash Point State Park Pocket Estuary Restoration in Federal Way*

Project Description

This project would improve the stream mouth of an unnamed creek (#0391) that enters Puget Sound through Dash Point State Park in Federal Way. The creek banks are armored from the mouth up to the road bridge, 200 feet upstream. The project would remove the armoring on both banks up to either the foot bridge (100 feet upstream from the mouth) or all the way to the road bridge (200 feet upstream). Between the footbridge and the road bridge there is a building approximately 50 feet from the right bank. An initial part of the project would be to evaluate if the armoring in this reach can be removed without endangering that building.

Opportunities and Constraints

- This project depends on the cooperation of Washington State Parks. The project does not appear to impact any direct park uses (picnicking, barbecuing, etc) and would improve the aesthetics of the park as well as the ecological values of the stream.



View upstream from mouth of creek #0391, showing armoring that would be removed.

LINKAGES

Conservation Hypotheses Addressed

- Protecting and improving riparian vegetation (All-2)
- Improving tributary access (All-3)
- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)

Habitat Management Strategies

- Protect/Restore shallow water habitat
- Protect/Restore intact riparian areas and associated functions
- Protect/Restore tributary mouths
- Protect/Restore beaches and backshore and associated plant communities
- Protect/Restore salt marshes



Project NS-17:

Functioning Nearshore Habitat Protection on Vashon/Maury Island



Vashon/Maury Island shoreline showing healthy nearshore habitat. September 2000 photo courtesy of the Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- *Protecting and improving riparian vegetation (All-2)*
- *Preventing/removing armoring and fill (All-6)*
- *Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)*
- *Protecting and restoring nearshore sediment transport processes (Near-3)*
- *Protecting and expanding forage fish spawning areas (Near-4)*
- *Protecting and enhancing pocket estuaries and tributary stream mouths (Near-5)*

Habitat Management Strategies

- *Protect sediment recruitment and transport processes*
- *Protect shallow water habitats*
- *Protect intact riparian areas*
- *Protect stream mouths*
- *Protect water quality where state standards are being met*
- *Protect cool, clean surface and ground water*
- *Protect current water quantity from further modification*
- *Protect beaches, backshore and associated plant communities*
- *Protect remaining salt marshes*

Project Description

Approximately 50 different locations along Vashon/Maury Islands have been identified as having high habitat resource values worthy of protection (see Figure 7-5 for the approximate locations). This list of locations was developed in part by the Vashon-Maury Island Land Trust. Protection of these nearshore habitats could occur through purchase, conservation easements, tax incentive programs, or other changes to property ownership. Alternative protection measures could include education and informational workshops for interested property owners.

Given the large list of locations, a further analysis of the threat of development to properties in those areas should be undertaken to help prioritize the list. The size and shape of each protection area will be determined through this further analysis, on-site visits, and discussions with current property owners regarding whether and how they wish to participate in protection efforts.

In addition, there are two high value habitat areas to be protected on the WRIA 9 mainland. One is in the Perkins Lane neighborhood of Magnolia in Seattle and the other in the city of Normandy Park.

Opportunities and Constraints

- This project depends on voluntary participation by property owners through easement, sale, or other incentives.



Project NS-18: *Sandford Point Feeder Bluff Restoration on Vashon Island*

Project Description

This project would remove a derelict bulkhead just north of Sandford Point on the west side of Vashon Island. Currently there is a failing creosote pile bulkhead in front of an active feeder bluff. While the bluff behind the bulkhead is still eroding, the bulkhead is limiting the amount of erosion that is occurring and it is holding back slide debris.

Opportunities and Constraints

- There do not appear to be any structures on top of the bluff that would require protection through a new bulkhead.
- The project would depend on voluntary cooperation of private property owners.



Site of proposed derelict bulkhead removal (bulkhead not easily visible in picture). September 2000 photo courtesy of the Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and restoring nearshore sediment transport processes (Near-3)
- Protecting and expanding forage fish spawning areas (Near-4)

Habitat Management Strategies

- Restore/Rehabilitate sediment recruitment and transport processes
- Restore/Rehabilitate shallow water habitats
- Restore/Rehabilitate riparian processes and functions
- Restore/Rehabilitate eelgrass and kelp beds by allowing natural processes to occur
- Restore/Rehabilitate beaches, backshore and associated plant communities
- Restore/Rehabilitate shoreline areas to reduce water quality impacts



Project NS-19:

Tramp Harbor Intertidal Fill Removal on Vashon Island



Sites of intertidal fill removal in Tramp Harbor. The King County Department of Transportation recently removed the smaller fill just to the left of the pier. September 2000 photo courtesy of the Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and restoring nearshore sediment transport processes (Near-3)
- Protecting and expanding forage fish spawning areas (Near-4)

Habitat Management Strategies

- Restore/Rehabilitate sediment recruitment and transport processes
- Restore/Rehabilitate shallow water habitats
- Restore/Rehabilitate eelgrass and kelp beds by allowing natural processes to occur
- Restore/Rehabilitate beaches, backshore and associated plant communities
- Restore/Rehabilitate shoreline areas to reduce water quality impacts

Project Description

There are currently two large areas intertidal fill located near the public dock along Dockton Road Southwest. The two areas of fill are being held in place by old creosote bulkheads. There are no structures on the fill. This project would remove the fill and reestablish a natural grade to the shoreline.

Opportunities and Constraints

- This project would complement a recent King County Department of Transportation project that removed a smaller amount of fill adjacent to a pier.
- It is not clear who owns the intertidal parcels. Purchasing of the two areas or permission from a private property owner(s) may be required.



Project NS-20: Maury Island Fill Removal

Project Description

There is currently an area of intertidal fill located between the Gold Beach neighborhood and the Glacier Northwest gravel pit pier. There are no structures on the fill. The fill appears to be causing some sediment to accumulate on the downdrift side of the fill. The fill also appears to be inhibiting natural erosion of the adjacent bluffs onto the beach. This project would remove the fill and reestablish a natural grade to the shoreline.

Opportunities and Constraints

- This project depends on the cooperation of Glacier Northwest.



Site of fill removal just southwest of the Gold Beach Neighborhood. September 2000 photo courtesy of the Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and restoring nearshore sediment transport processes (Near-3)
- Protecting and expanding forage fish spawning areas (Near-4)

Habitat Management Strategies

- Restore/Rehabilitate sediment recruitment and transport processes
- Restore/Rehabilitate shallow water habitats
- Restore/Rehabilitate eelgrass and kelp beds by allowing natural processes to occur
- Restore/Rehabilitate beaches, backshore and associated plant communities
- Restore/Rehabilitate shoreline areas to reduce water quality impacts



Project NS-21: ***Sandy Beach Fill and Derelict Pier Removal on Vashon Island***



Site of proposed pier removal (left) and intertidal fill removal (right) just south of the Sandy Beach neighborhood. September 2000 photo courtesy of the Washington State Department of Ecology.

LINKAGES

Conservation Hypotheses Addressed

- Preventing/removing armoring and fill (All-6)
- Protecting/increasing vegetated shallow nearshore and marsh habitats (Near-2)
- Protecting and restoring nearshore sediment transport processes (Near-3)
- Protecting and expanding forage fish spawning areas (Near-4)

Habitat Management Strategies

- Restore/Rehabilitate sediment recruitment and transport processes
- Restore/Rehabilitate shallow water habitats
- Restore/Rehabilitate riparian processes and functions
- Restore/Rehabilitate eelgrass and kelp beds by allowing natural processes to occur
- Restore/Rehabilitate beaches, backshore and associated plant communities
- Restore/Rehabilitate shoreline areas to reduce water quality impacts

Project Description

There is currently an area of intertidal fill and a derelict dock located just south of the Sandy Beach neighborhood on the west side of Vashon Island. The fill is in the form of an intertidal rockery, which appears to be acting as a deeper water bulkhead. This project would remove the fill and the derelict dock and reestablish a natural grade to the shoreline.

Opportunities and Constraints

- The dock and the fill appear to be on two different properties.
- The project would depend on voluntary cooperation of private property owners.