CHAPTER 13: COMPREHENSIVE ACTION LISTS FOR MIGRATORY AND REARING AREAS

LAND USE, PLANNING, AND INFRASTRUCTURE ACTIONS FOR ESTUARY/NEARSHORE (Migratory Tier 1)	
POLICY/INSTITUTIONAL CONTEXT: ***Jurisdictions:*** Seattle, Shoreline, Woodway, Edmonds, Mukilteo, Snohomish County ***Growth pressures (inside UGA):*** All jurisdictions; note Snohomish Co. area includes Mukilteo and Edmonds MUGAs ***Percent of basin inside UGA:*** 100% ***Program/mitigation opportunities:*** Sno Co. Marine Resources Advisory Committee; Sound Transit mitigation; PSNERP; Brightwater mitigation (outfall?)	**SCIENCE CONTEXT:** ***Watershed evaluation rating:*** Not applicable ***Watershed evaluation summary:*** Not applicable **Note:** Approximately 54% of the WRIA 8 marine shoreline lies within Snohomish County; the remaining 46% lies in King County.

LAND USE ACTIONS FOR ESTUARY/NEARSHORE BASED ON TECHNICAL RECOMMENDATIONS IN WRIA 8 CONSERVATION STRATEGY

Notes:

1) Technical priorities from the WRIA 8 Conservation Strategy are listed in bold; recommended land use actions are listed for each technical area. Most technical recommendations are interrelated; many land use actions address multiple technical priorities.
2) Note that local jurisdictions in these subareas are doing or planning to do many of these actions.
3) See also Appendix D for a menu of land use actions described by criteria, and references on low impact development, critical areas and other land use topics.
4) Land use recommendations were not developed for the Locks/Ship Canal. However, local jurisdiction staff who met to develop the site specific project list for this area discussed some land use and programmatic issues; their recommendations appear on the first page of the site specific project list under "Subarea-Wide Projects."
5) A number of regulatory measures recommended below might be administered through local Shoreline Master Programs or Critical Areas Ordinances. Nearshore jurisdictions should strive for consistency with Ecology's *Washington State Shoreline Master Program Guidelines*, referenced below.

Protect remaining feeder bluff that supplies sediment and supports littoral habitat creation.

M1 Bluffs on Magnolia and Discovery Park in Seattle are the only ones in WRIA 8 that are not armored by the railroad and have some unarmored locations (publicly and privately owned). Prohibit bulkheads or any other form of armoring and development at these locations through Seattle's critical areas ordinance and Shoreline Master Program.

Reduce bank hardening, especially in areas where the armoring falls within the tidal zone and/or separates a sediment source from the nearshore environment. Such actions would help restore natural shoreline accretion and depletion processes and support littoral habitat creation.

M2 Support King County-funded sediment source study to 1) establish where feeder bluffs were prior to the railroad and 2) qualitatively assess rates of erosion and sediment contribution of those bluffs. Based on study results, open up certain slide prone areas so that slides make it into the nearshore (e.g., by building trestles under railroad), and/or investigate appropriateness of a beach nourishment program. Expect study completion by 3/05.

M3 Use results from King County sediment source study to map those bluffs that are most critical to protect (to preserve future opportunities to restore them to natural function), and protect them from future development through critical areas ordinance and/or Shoreline Master Program updates or acquisition. Note that the issue of protecting feeder bluffs must balance health and safety with ecological needs. Steep slopes that are already developed need to be protected from erosion as a health and safety issue. However, where steep slopes are not developed, future development should be prohibited so that these areas provide vegetative cover and potential sediment sources in the future. Development that does occur should be setback further from the top of the bluff for health and safety reasons.

- See stormwater management recommendations below under *water quality*; drainage issues throughout sub-area and from development near tops of bluffs have significant impacts on bluff stability.

M4 Residential, commercial, and industrial development west of the railroad (e.g. Nakeeta Beach residential community, Meadowdale Marina, Point Wells, Richmond Beach) should be addressed in various ways:

- ✓ Prohibit new development, at least in areas designated as conservancy.
- ✓ Determine if there are failing septic systems, and require that they be fixed. Require that septics be inspected at time of sale.
- ✓ During redevelopment in any of these areas, reduce overall impacts to nearshore, e.g., limit additional riprap to that required to protect structures, require riparian revegetation, avoid construction in intertidal zone, use smallest feasible footprint for structures.
- ✓ Seek opportunities to redevelop industrial sites into less intensive uses.
- ✓ Protect nearshore from water quality impacts including spills at industrial sites.
- ✓ In the long term, if site specific projects are pursued "to remove structures, fill, and bulkheads" through fee simple purchase of parcels, address any regulatory or programmatic actions which are needed to support these projects.

M5 Wherever possible, offer incentives or regulatory flexibility to encourage bank softening in Salmon Bay. Note that opportunities are limited due to topography, lot size, and structure location close to the water.

M6 Work with Dept. of Ecology and Burlington Northern Railroad (BNRR) to revise policies that address how slide material on or near the track is handled after a slide. One option would be to encourage side-casting slide debris/sediment into the nearshore rather than removing all of it from the site. Note that side-casting is controversial because it buries existing invertebrate and plant communities, but would be mimicking natural processes if not for the railroad.

Protect remaining Marine Riparian Vegetation (MRV), to maintain overhanging cover and terrestrial inputs (e.g. leaf litter, invertebrates) for juvenile chinook and their prey.

M7 Protect remaining nearshore vegetation (on low or high bluffs) through regulation and/or acquisition. Regulatory tools to protect vegetation on bluffs, and to prevent further development on and near the top of bluffs, include:

- ✓ Steep slope ordinances
- ✓ Bald eagle protection ordinances
- ✓ Critical areas ordinances
- ✓ Clearing ordinances

Plant vegetation along shoreline, close to the Mean High High Water (MHHW) line to provide overhanging cover and terrestrial inputs (e.g. leaf litter, invertebrates) for juvenile chinook and their prey.

M8 Develop and offer incentives to encourage bulkhead removal/redesign and revegetation along shoreline, including:

- ✓ Offer regulatory flexibility during redevelopment (e.g., encourage variances from front yard setbacks to avoid variances from backyard setbacks that would cause development to encroach further toward the shoreline; allow modest increase in lot coverage or reduction in building setback in exchange for restoring shoreline vegetation)
- ✓ Provide expertise (e.g., provide templates for shoreline planting plan, bulkhead design)

- ✓ Expedite permit process at local, state and federal levels (e.g., allow more restoration activities as shoreline exemptions to make permitting faster and less costly)

M9 Promote educational programs (e.g., Island County Beach Watchers) to promote stewardship among homeowners along nearshore and estuary, as such educational programs increase the effectiveness of regulatory and incentive approaches.

Reduce number and coverage of overwater structures (e.g., docks, piers) to reduce segmentation of shoreline and effects on both habitat forming processes and juvenile chinook behavior.

M10 Prohibit new residential overwater structures. For new public facilities (e.g., ferry docks), incorporate salmon-friendly design features and mitigate for unavoidable impacts.

M11 Retrofit existing overwater structures with salmon friendly design features. Remove overwater structures and pilings when possible.

M12 Offer incentives to build community docks to replace individual docks in Salmon Bay.

M13 Use guidelines for marine overwater structures (see references below) to develop specifications. If applicant meets specifications, offer expedited local/state/federal permitting (similar to concept being promoted for Lake Washington overwater structures by NOAA Fisheries and other agencies). Guidelines should include: overwater structure design and materials that increase light penetration under the dock (e.g., increase height, decrease width, use grating), elimination of construction materials that may release environmental contaminants.

Protect or reconnect small stream mouths to create pocket estuaries.

M14 Protect any further degradation to stream mouths through Shoreline Master Programs and critical areas ordinances.

M15 Address water quality and quantity (high and low flows) in creeks draining into Puget Sound, through improved stormwater management programs and regulations. (See additional stormwater recommendations below under *water quality*.)

M16 Replace culverts with open bottom culverts or bridges/trestles wherever possible to allow for sand and gravel, LWD, and terrestrial inputs to contribute to the nearshore.

Reconnect backshore areas (e.g., marshes, wetlands) to contribute to shoreline habitat diversity and terrestrial inputs.

M17 Enforce critical areas regulations to prevent further loss of wetlands.

M18 Once wetlands are restored, protect from impacts from development through buffer requirements and stormwater management programs.

Protect sediment and water quality, especially near commercial and industrial areas (e.g., fuel spills, discharge of pollutants, etc.).

M19 Address stormwater impacts throughout sub-area and from development near tops of bluffs. Actions include:

- ✓ Protect water quality through NPDES Phase 1 and 2 permits and improved stormwater regulations, consistent with Dept. of Ecology's 2001 Stormwater Management Manual.
- ✓ Require or encourage low impact development
- ✓ Retrofit existing developments using natural drainage systems (e.g., SEAStreets in Pipers Creek)
- ✓ During redevelopment, reduce impervious area, increase native vegetation and use of pervious surfaces.
- ✓ See basin-wide discussion of stormwater standards in Appendix D (including Dept. of Ecology's 2001 Stormwater Management Manual, PSWQAT stormwater guidelines, Tri-County stormwater standards).

M20 Determine extent to which residential structures along nearshore are on septic systems; determine if these systems are operating properly and if not require that they be fixed. Require that septic systems be inspected at time of sale.

M21 Discourage or prohibit any further filling and dredging in nearshore except for essential public facilities and where associated with shoreline restoration projects. See dredging guidelines below.

Other programmatic efforts not tied to specific technical recommendations:

M22 Revise the "Prohibited Work Times in Saltwater Areas" listed in the Washington Hydraulic Code Rules (WAC 220-110-271). The saltwater closure periods listed in the Washington Administrative Code (WAC) are out of date. The juvenile salmonid closure period corresponds with the timing of chum and pink salmon, and not ESA listed Chinook. While WDFW area habitat biologists have leeway in modifying the work closure timing, it would be prudent to correct the WAC with more accurate salmonid timing data. [action suggested by WRIA 8 Technical Cmt]

References for further information:

The local jurisdictions that worked on these land use actions wanted to refer to the following technical references (see complete citations and web links in Appendix D, Part 6):

- Wash. Dept of Ecology's Shoreline Master Program Guidelines
- Wash. Dept. of Community, Trade and Economic Development critical areas handbook
- Puget Sound Water Quality Action Team's "Growth Management Updates" guidance
- References for marine overwater structures: G.D. Williams et al. May 2001; Nightingale, Barbara and Charles Simenstad. May 2001.
- References for marine dredging: Nightingale, Barbara and Charles Simenstad. July 2001.

RESTORATION: Prioritization of Site-Specific Restoration Projects for the Ship Canal/Locks

Please note: Reaches of the Ship Canal/Locks were not prioritized by the EDT Model due to lack of certainty. Therefore potential restoration projects for this area are prioritized by expert opinion on Benefits to Chinook and Ease of Implementation.

Reach #	Proj. #	Description	Benefits to Chinook	Ease of Implem.
Ship Canal Locks	M204	Add/Replace event entrainment.	**H**	**H**
Ship Canal Locks	M206	Improve estuary conditions upstream of loc	**H**	**M/L**
Ship Canal Locks	M205	Locks Naturaltuary: Construct a more natural, fairly wide and long channel at the Locks.	**H**	**L**
Ship Canal Locks	M201	Further reduce lockage speed for large locks.	**M**	**H**
Ballard locks to start of Fremont Cut (Salmon Bay)	M209	Ballard Bridge Water Quality Improvements.	**M**	**M**
Portage Bay	M216	Explore ways to reduce predation in Portage Bay.	**M**	**M**
Lake Union (Fremont Cut to University Bridge)	M212	South Wallingford Drainage Improvements.	**M/L**	**M**
Fremont Cut to Portage Bay	M214	Remove North Lake Union In-Water Structures.	**M**	**M/L**
Gasworks Park	M213	Bank Softening and Revegetation at Gasworks Park.	**M/L**	**L**
University Bridge	M215	7th Ave Street End Park Creation and Shoreline Restoration.	**L**	**H**
Ship Canal Locks	M202	Fish Ladder Improvements at Locks.	**L**	**H/M**
Ballard locks to start of Fremont Cut (Salmon Bay)	M208	Ballard Bridge Shoreline Restoration.	**L**	**H/M**
Fremont Cut	M211	99 Bridge Shoreline Restoration.	**L**	**M**
Fremont Cut	M210	Demonstration Restoration Project at Fremont Bridge	**L**	**M/L**
Ship Canal Locks	M207	Explore needs/options for "Low Elevation" smolt passage at locks.	**?**	**L**
Montlake Cut	M217	Explore options for deepening the Montlake Cut.	**?**	**L**
Ship Canal Locks	M203	Add fishway lighting for the ladder.	**?**	**?**

PROTECTION: Prioritization of Site-Specific Protection Projects for the Nearshore

Please note: Nearshore subarea reaches not prioritized by EDT Model due to lack of certainty. Therefore these projects are prioritized based on expert opinion on their Benefits to Chinook and Ease of Implementation. Protection projects are also prioritized based on exisiting habitat protection priorities identified by science-based habitat protection programs. Shaded projects below are identified as priorities for protection by the Snohomish County Marine Resources Advisory Committee.

Reach #	Proj. #	Description	Benefits to Chinook	Ease of Implem.
Reach 8: Mukilteo St Park to Picnic Pt	M221	City of Mukilteo Tideland and Shoreline Acquisitions Program.	H	H
Reach 10A: Edwards Point to Meadow Point	M242	Point Wells North Habitat Acquisition of 850 feet of shoreline.	M	M
Sub-Reach 9.04: Lunds Gulch	M229	Meadowdale Marina Acquisition and Removal.	M	M/L
Sub-Reach 8.05: Big Gulch	M225	Shipwreck/Hulk Creek Acquisition: Acquisition and restoration of former shipyard site.	M	M/L
Reach 10A: Edwards Point to Meadow Point	M241	Deer Creek Habitat Acquisition.	M/L	M

RESTORATION: Prioritization of Site-Specific Restoration Projects for the Nearshore

Please note: Nearshore reaches were not prioritized using the EDT Model due to uncertainty. Therefore potential Nearshore projects are prioritized using expert opinion of Benefits to Chinook and Ease of Implementation.

Reach #	Proj. #	Description	Benefits to Chinook	Ease of Implem.
Sub-Reach 9.15: Willow Creek	M233	Willow Creek Daylighting.	H	H
Reach 8: Mukilteo St Park to Picnic Pt	M218	City of Mukilteo's Riparian Vegetation Enhancement Program.	H	M
Sub-Reach 9.15: Willow Creek	M237	Point Wells Complete Site Restoration.	H	L
Reach 12: North Discovery Park to West Point	M252	Shilshole Bay South Buyout and Restoration.	H	L
Reach 10A: Edwards Point to Meadow Point	M235	Woodway Tidal Lagoon North culvert improvement project.	H/M	H
Reach 10A: Edwards Point to Meadow Point	M236	Deer Creek Restoration or Culvert Replacement.	H/M	H/M
Sub-Reach 8.05: Big Gulch	M222	Big Gulch Culvert Replacement.	H/M	M
Reach 10A: Edwards Point to Meadow Point	M238	South Point Wells Habitat Restoration.	H/M	M/L
Reach 10A: Edwards Point to Meadow Point	M239	South Point Wells Lagoon Creation.	H/M	M/L
Reach 10A: Edwards Point to Meadow Point	M240	Richmond Beach North Property Acquisition of shoreline homes.	H/M	L
Reach 11: Shilshole to Locks (Estuary Reach)	M250	Commodore Park and Wolfe Creek Restoration.	H/M	L
Sub-Reach 9.15: Willow Creek	M234	Willow Creek Pier Removal.	M	H
Reach 11: Shilshole to Locks (Estuary Reach)	M247	Salmon Bay Natural Area Restoration.	M	H/M

Reach #	Proj. #	Description	Benefits to Chinook	Ease of Implem.
Reach 9: Picnic Point to Edwards Point	M227	Picnic Point Culvert Replacement.	**M**	**M**
Sub-Reach 9.04: Lunds Gulch	M228	Lunds Gulch Culvert Improvement and Riparian Enhancement.	**M**	**M**
Sub-Reach 10A.12: Pipers Creek	M244	Pipers Creek Culvert Replacement.	**M**	**M**
Sub-Reach 8.05: Big Gulch	M224	Shipwreck/Hulk Creek Restoration.	**M**	**M/L**
Reach 11: Shilshole to Locks (Estuary Reach)	M249	Salmon Bay Dock Consolidation.	**M**	**M/L**
Reach 8: Mukilteo St Park to Picnic Pt	M220	Nakeeta Beach Home Acquisition.	**M**	**L**
Sub-Reach 9.08-9.09: Shell Creek	M230	Shell Creek Beach Nourishment.	**M**	**L**
Reach 10B: Meadow Pt to Shilshole	M245	Golden Gardens Pocket Estuary Creation.	**M**	**L**
Reach 12: North Discovery Park to West Point	M251	West Point Pocket Estuary.	**M**	**L**
Reach 11: Shilshole to Locks (Estuary Reach)	M246	Azteca/Golden Tides Restoration.	**M/L**	**M**
Reach 11: Shilshole to Locks (Estuary Reach)	M248	Restoration of Seattle Street End Near Salmon Bay	**M/L**	**M**
Sub-Reach 8.05: Big Gulch	M223	Big Gulch High-Flow Bypass and Restoration.	**M/L**	**M/L**
Reach 9: Picnic Point to Edwards Point	M226	Picnic Point Riparian Enhancement.	**L**	**H**
Reach 8: Mukilteo St Park to Picnic Pt	M219	Mukilteo Lighthouse Park Restoration.	**L**	**H**
Sub-Reach 9.08-9.09: Shell Creek	M232	Bracketts Landing Park Vegetation Enhancement.	**L**	**H**
Sub-Reach 9.08-9.09: Shell Creek	M231	Shell Creek Culvert Replacement.	**L**	**L**
Sub-Reach 10A.10: Boeing Creek	M243	Barnacle Creek Wetland Construction.	**L**	**L**

DRAFT Locks/Ship Canal/Lake Union - Tier I - Initial Habitat Project List

Locks/Ship Canal/Lake Union Reaches

Notes on Rankings:

- Water temperature and quality are recognized as the primary threats to Chinook in this subarea. Projects that address these threats receive higher ratings as a result.
- There are many potential vegetation restoration projects throughout the subarea at the various street ends and other similar small sites. These projects are individually very small and therefore receive Low rankings for benefits. These projects are better evaluated cumulatively for the entire subarea, where many such projects could produce larger benefits.

Basinwide Recommendations:

Project #	Description
M601	Explore opportunities for shoreline/riparian vegetation opportunities (But be careful not to create overwater and inwater structures that could form bass habitat).
M602	Work with shoreline businesses, shipyards, marinas, and property owners to reduce water pollution (shoreline "steward" person).
M603	Improve monitoring and enforcements of existing water quality regulations. This does not necessarily have to be through a threatening presence, but could be through
	outreach/education. ECOSS in the Duwamish could serve as an example
M604	Develop and/or advertise BMPs for houseboats and liveaboards. Also assess the extent/impact of heat-pump water temperature alterations.
M605	Reduce the number of toxic pilings in the subarea and encourage the use of non-toxic pilings (steel and concrete). Also reduce use of treated material in docks and other overwater structures.

Ship Canal Locks:

Restoration

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M201	L	not ranked	1a	**Further reduce lockage speed** for large locks to reduce smolt entrainment in filling culverts.		Lock speed has already been reduced from "fast" to "medium". Previous test indicated that "fast" speeds resulted in significant smolt entrainment. There was not a significant difference in entrainment between medium and low speeds, but it is presumed that low speeds would be better for smolts. May be less of a concern now due to annual removal of barnacles and new strobe lights, if they are repaired to function properly. Current gates incapable of accomplishing "slow" fill speeds, but gates are due for replacement, and new gates could accomplish slow speeds without additional cost. There is some concern that shifting to a slow fill may be upsetting to some users of the large lock, as the time to fill would increase substantially. In addition, low fill volumes used during low water conditions seems to reduce entrainment. Slow fill and strobe lights should be operated in tandem to achieve maximum benefits.	**M**	**H**
M202	L	not ranked	1b	**Fish Ladder Improvements:** Improve downstream entrance to the fish ladder with a telescoping weir and a horizontal gate. Close the slot on the downstream end to concentrate the flow.		Fish ladder is quite old, and there is some evidence that the hydraulic conditions at the end of the ladder are not ideal for fish. Despite this, there is not much evidence that fish are unable to find the ladder. Uncertainty exists as to whether any additional time required to find/use the ladder may contribute to additional mortality. There has also been a proposal to trap and transport adult Chinook to Lake Washington. Others feel that this option should be avoided until other options have been explored.	**L**	**H/M**
M203	L	not ranked	1c	**Add fishway lighting for the ladder.**		Meeting participants were unsure why this would be done, or what the benefit could be. Perhaps this could improve fish use of the ladder at night? This may be related to the questionable perception that the ladder is a slow point for fish, which may be affecting mortality.	**?**	**?**

M204	L	not ranked	new	**Add/Replace strobe lights** to locks to deter smolts and prevent entrainment.		Strobe lights have demonstrated a clear reduction in entrainment in experimental tests, but a durable operating system is not in place as yet. The experimental system has had operating problems for the past 3 years. A new waterproof cable and light system is needed to replace the experimental system for long term operation. Slow fill and strobe lights should be operated in tandem to achieve maximum benefits.	**H**	**H**
M205	L	not ranked	new	**Locks Natural Fishway & Estuary:** Construct a more natural, fairly wide and long channel at the Locks facility that would allow both adult and juvenile fish to move back and forth between warmer lake outflow and cooler tidal water, and allow tidal change to inundate areas designed into the channel where both adults and juveniles could find refuge to hold and choose their preferred salinity.		While envisioned for the south side, to replace the function of the existing fish ladder and perhaps some portion of the existing spillway dam, locating a channel somewhat inland on the north side of the Locks may also be a possibility. In principle the project would create a "longer" estuary environment with more mixing. Some design challenges exist, particularly related to mixing as fresh water sits on top of the salt water, and it is difficult to encourage mixing. There may be mechanical means to cool/mix water in the Ship Canal above the Locks. Could also investigate feasibility of artificially cooled water or use of aerators to increase DO levels. There may be a similar project being designed in BC that could serve as a model.	**H**	**L**
M206	L	not ranked	new	**Improve estuary conditions upstream of locks:** Modify the salt water barrier or change operation of the barrier while increasing the number of large lockages to introduce cool marine waters above the locks , and create a longer estuary environment. Project might also be accomplished by moving the salt water drain upstream to the West end of the Fremont Cut.		This is largely an operational change that can be accomplished now but will require using more water and potentially changing the salinity standard at the University Bridge. The area of improvement for water quality is not very large, only extending upstream of the locks a couple of thousand feet. It does not substantially improve the amount of estuary habitat, but maintains a localized, minimum amount available for adult and juvenile chinook in the immediate vicinity of the Locks. It will introduce more salt into the system but cooler temperatures and higher DO is only found in the local area near the Locks, no other benefits are clearly demonstrated for areas upstream. Recreational boat owners in Salmon Bay and vicinity might also be opposed unless they can be convinced that the salt water will be too deep to affect boats. Concerns have been raised about the cost and engineering feasibility of moving the saltwater drain. High ranking assumes a 1-2 degree change in temperature.	**H**	**M/L**

M207	L		new	**Explore needs/options for "Low Elevation" smolt passage at locks:** Project would consider structural options for smolt passage when use of smolt flumes drops off.		This project may not be necessary, as the large locks may be serving this purpose. This should be investigated.	**?**	**L**

Lk Union-Ship Canal Littoral-1: Ballard locks to start of Fremont Cut (Salmon Bay)

Restoration

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M208	1	not ranked	new	**Ballard Bridge Shoreline Restoration:** Potential habitat restoration/public access area under the Ballard Bridge. The potential exists to connect the project with a tiny green space created privately just to the west of site, and the Seattle Central Community College Marine Technology Center's landscaped shoreline to the east.		Groundswell NW has been approached recently by Phillip Riedel, a Ballard architect who has developed proposals for public access and habitat under the Ballard Bridge, on the north side of the Ship Canal crossing. The "Under Ballard Bridge" proposal, in its current seminal form, includes riparian restoration. It also includes a proposal for looking at ways to improve the treatment of rainwater run-off from the Ballard Bridge, which currently is discharged on the surface. Mostly a riparian vegetation project. Possibly also a raised walkway for public access. Water quality problems related to the Ballard Bridge could negate any potential value from the project unless they are addressed (see next project). Nearby industrial businesses may oppose further public access in the area. Groundswell NW is also involved in developing a Greater Salmon Bay Concept Plan to identify other potential sites for restoration opportunities.	**L**	**H/M**
M209	1	not ranked	new	**Ballard Bridge Water Quality Improvements:** Project could be combined with the above project to treat water on site at the proposed vegetation site with bioswales.		Water quality is a major problem, and everything that can be done to address it is important. There may be some mitigation required for the Monorail bridge being constructed in this area. There was some concern expressed about the small scale of this project relative to all the surface area of streets in the area, but it was still perceived as a worthwhile endeavor.	**M**	**M**

Lk Union-Ship Canal Littoral-2: Fremont Cut

Restoration

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M210	2	not ranked	Ship Canal 1	**Demonstration Project at Fremont Bridge:** Work with U.S. Army Corps of Engineers to construct a demonstration project on federal lands West of the Fremont Bridge, where there is an area available for bank re-sloping, addition of native vegetation, and rock removal. Hypothetically, this would provide a refuge site for migrating juveniles.		Current research suggests that fish tend to move about freely through the cut, rather than hugging the edges. There are no predators in the brackish waters of the cut, so survival is nearly 100% for this section. Although the demonstration value of the site might be valuable, it was recommended that restoration efforts be focused East of the Fremont Bridge where fish spend more time and mortality is a more serious concern. There is uncertainty whether restoration efforts in this area could actually increase habitat for predators.	**L**	**M/L**

Lk Union-Ship Canal Littoral-9 through 12: Lake Union (Fremont Cut to University Bridge)

Restoration

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M211	9	not ranked	new	**99 Bridge Shoreline Restoration:** Remove riprap and restore vegetation under the 99 bridge on the north side of the Lake near the Adobe property.		Small site. Thought to be in public ownership.	**L**	**M**
M212	9 to 12	not ranked	new	**South Wallingford Drainage Improvements:** Seattle Public Utilities is working on a plan to address water quality and drainage problems along Northlake Way from Stone Way to I-5. Project may also be combined with several street end revegetation projects. The community is working on a related plan for street improvements.		SPU applied for King County special projects funding. Community received a Neighborhood Matching Grant. Significant community support for project. Benefits of project depend upon the extent of improvements.	**M/L**	**M**
M213	10 to 11	not ranked	new	**Bank Softening and Revegetation at Gasworks Park:** Large area for potential shoreline restoration including bank softening and revegetation.		Concerns about soil contamination at the park may limit feasibility. Therefore revegetation may be more feasible than bank softening. Need to be sure that bank softening projects do not inadvertently create habitat for bass. Lots of public access to the site. Potential to combine project with future contaminant clean-up operations.	**M/L**	**L**

M214	9 to 14	not ranked	new	**Remove North Lake Union In-Water Structures:** Project would remove in-water structures and debris (sunken boats, refrigerators, shopping carts, etc.) to reduce habitat for bass and other predators from the Freemont Cut to the Montlake Cut.		Project may also help reduce toxic leaching from some debris over time. More information on the scope of this project will be available soon from SPU, who is conducting bathymetry studies to map debris. Need to also consider appropriate depth(s) to focus on and also consider potential for contaminated soils in some areas.	**M**	**H/M**
M215	12	not ranked	new	**7th Ave Street End Park Creation:** Pro-Parks Levy project. Potential for shoreline restoration to go along with park establishment.		Project planning has begun. The community advocated that the property be turned into a park since there are so few University District open spaces. The street end is owned by DNR but managed by SDOT. Two community meetings will be scheduled to review possible design scenarios and then build in 2005. As with other street end projects, this is small and is likely to produce only minimal benefits on its own. Should be considered as part of a larger subarea-wide approach.	**L**	**H**

Lk Union-Ship Canal Littoral-13 & 14: Portage Bay

Restoration

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M216	13 & 14	not ranked	new	**Explore ways to reduce predation in Portage Bay.**		Predation in Portage Bay is not well understood but may be high near the UW hatchery and near the mouth of the Montlake Cut. Further study should be conducted to evaluate the extent of predation in the area. Possible opportunities for reducing predation in the area could include an annual "Bass Derby" fishing event to reduce predator populations in June before Chinook smolt migration.	**M**	**M**

Lk Union-Ship Canal Littoral-15: Montlake Cut

Restoration

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M217	15	not ranked	new	**Explore options for deepening the Montlake Cut** to allow colder water from Lake Washington to flow in Lake Union.		May be technically difficult. Need to look at thermocline and salinity issues to assess feasibility as well as other possible water quality/hydrodynamic issues. May result in saltwater intrusion into Lake Washington.	**?**	**L**

Preliminary DRAFT Nearshore/Estuary Chinook Population - Tier I - Initial Habitat Project List

Includes Potential Restoration and Protection Projects by Reach.

Nearshore/Estuary Reaches 8-12 and Sub-reaches

Basinwide Recommendations:

Project #	Description
M606	Explore opportunities for riparian restoration.
M607	Explore opportunities for piling removal.

Please note: There is scientific uncertainty about Nearshore habitat and Chinook use of that habitat. Due to these uncertainties the Nearshore reaches were not prioritized using the EDT model. Experimental approaches to the protection of functioning habitat & the restoration of ecosystem processes should be implemented.

Potential basin wide research opportunities:

- Explore bluff sloughing as sediment source - (King County is working on this).
  - Examine the shoreline for locations to allow natural beach and bluff erosion to occur among the hardened BNRR track right away. (Ranking B2C: M/H, Feasibility: M)
  - Study should focus on current processes shaping the beach and the intertidal zone and out to include eelgrass beds and other like features.
- Explore Woodway slide sediment transport.
- Study using dredged materials from Snohomish and elsewhere to conduct beach nourishment projects.

Reach 8: Mukilteo St Park to Picnic Point

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M218	8		Nearshore 5	**City of Mukilteo's Riparian Vegetation Enhancement:** In its 2004 Draft Shoreline Plan, the City of Mukilteo has identified priority properties for a nearshore riparian revegetation enhancement program. Work will be done using volunteer labor.		Potential locations for riparian revegetation: Edgewater Creek, Japanese Creek and Tank Farm, Lighthouse Park, Big Gulch Creek, Shipwreck/Hulk Creek, Picnic Point Creek/Park, Lund's Gulch/Meadowdale Park. See more detail on each location in list below.	**H**	**M**

M219	8		New	**Mukilteo Lighthouse Park:** Enhance the beach profile and marine riparian conditions by removing or setting back the existing park facilities along the shoreline and planting native marine riparian vegetation with only limited access points to the beach. Site identified by MRC and city of Mukilteo in 2004 park master plan.		Mukilteo Lighthouse Park was transferred from the Washington State Parks Department to the City of Mukilteo in 2002. Southern nearshore of park has good intact eelgrass beds. Potential study site to explore feasibility of riparian beach restoration. Little potential for overhanging riparian vegetation due to close proximity to railroad. Marine riparian vegetation is limited to small patches of Nootka rose, dune rye grass, and gumweed. While a good pilot project, project does not address the factors of decline for Chinook.	**L**	**H**
M220	8		New	**Nakeeta Beach Home Acquisition:** Restore the site by purchasing the fee simple property rights for all of the parcels and removing the houses, fill, and sea wall. A lifetime estate arrangement would allow the property owners to continue living on the site. Restoration work could not start until the residents vacated their properties according to the lifetime estate agreements.		Nakeeta Beach is a residential community built on top of approximately two acres of the upper intertidal zone of the western Mukilteo shoreline. The site includes ten houses that are protected by a nearly continuous concrete sea wall. Residential sewage is disposed of through on-site septic systems. The southernmost parcel within the site is undeveloped. Approximately half of the houses are occupied year-round and the others are summer homes.	**M**	**L**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M221	8		Nearshore 4		**City of Mukilteo Tideland and Shoreline Acquisitions:** The City of Mukilteo is evaluating the Nearshore within its jurisdiction for additional potential tideland acquisition and shoreline habitat protection projects.		As opportunities present themselves especially adjacent or between publically owned lands and tidelands.	**H**	**H**

Sub-Reach 8.05: Big Gulch

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M222	S8.05		New	**Big Gulch Culvert Replacement:** Replacement of the undersized culvert under the railroad with a trestle system to restore system connectivity and improve sediment transport into the nearshore.		Concerns exist about toxics in the upstream portion of the Big Gulch system. The headwaters of Big Gulch Creek drain the western portion of Paine Field Airport. Chemical spills in the vicinity of Paine Field in 1993, 1996, and 2000 resulted in downstream fish kills. Concerns were also raised about drainage problems upstream that could complicate the project. It was recommended that the project be coordinated with the next project if it is done.	**H/M**	**M**
M223	S8.05		New	**Big Gulch High-Flow Bypass and Restoration:** A High-flow bypass has been proposed by Snohomish County, Mukilteo and the local sewer district to address drainage and related erosion problems in the basin. Riparian restoration (improving nearshore habitat around the Big Gulch Creek outfall by adding sediment along the seaward side of the railroad to recreate a beach profile that will support marine riparian vegetation) has been proposed to accompany this project. Explore potential for pocket estuary.		The headwaters of Big Gulch Creek drain the western portion of Paine Field Airport. Chemical spills in the vicinity of Paine Field in 1993, 1996, and 2000 resulted in downstream fish kills. Concerns were also raised about the by-pass itself and whether it may conflict with other goals. Eelgrass extends from the stream outfall to the north. Puget Sound Saltwater Anglers and local residents have demonstrated a stewardship commitment for Big Gulch Creek by conducting stream surveys and counting returning salmon. Project feasibility study and planning are under way.	**M/L**	**M/L**
M224	S8.05		New	**Shipwreck/Hulk Creek Restoration**: Work with the property owners to enhance the marine riparian vegetation at the site. This would increase the amount of shade for potential forage fish spawning in the upper intertidal zone. Property is currently privately owned. Approximately 1000 ft. of shoreline restoration potential.		Site holds high potential for marine riparian vegetation restoration/enhancement. A mid-sized backshore area supports some marine riparian vegetation and there appears to be potential for enhancement with additional native planting. Eelgrass extends from this site to the north. Need to explore feasibility of removing ship hulks at site. Potential exists for contamination issues related to old shipyard on site.	**M**	**M/L**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M225	S8.05			New	**Shipwreck/Hulk Creek Acquisition:** Acquisition and restoration of former shipyard site. Property is currently privately owned. Approximately 1000 ft. of shoreline restoration potential. It may be possible to protect the site by purchasing the fee simple property rights or some form of conservation easement. A lifetime estate arrangement would allow the property owners to continue living on the site while ensuring its preservation and enhancement of marine riparian vegetation.	$1 Mil.	If acquired, site holds high potential for marine riparian vegetation restoration/enhancement. A mid-sized backshore area supports some marine riparian vegetation and there appears to be potential for enhancement with additional native planting. Eelgrass extends from this site to the north. Need to explore feasibility of removing ship hulks at site. Potential exists for contamination issues related to old shipyard on site.	**M**	**M/L**

Reach 9: Picnic Point to Edwards Point

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M226	9		New	**Picnic Point Riparian Enhancement:** Project underway to do planting, weed control and some interpretive materials on the shoreline side of the railroad tracks. Project will addresses approx. 1200 ft of shoreline.		Snohomish County MRC Project Underway (fully funded). Site has existing value for juvenile Chinook. Potential for some $ for fish passage issues at the parking lot and also higher in the watershed. This project includes marine riparian enhancement, creosote log removal, installation of nearshore interpretive signage, and feasibility and design of alternatives to address flooding, erosion, and fish passage problems. Benefit to Chinook might increase to medium if culvert is removed.	**L**	**H**
M227	9		New	**Picnic Point Culvert Replacement:** Replacement of the existing culvert under the railroad with a trestle to restore connectivity and improve sediment transport from the uplands. Project may also benefit fish passage.		Lots of drainage/slope stability problems exist in the drainage as identified by Snohomish County plan. Site currently hosts quite a bit of sediment deposition from the creek, but could be improved with the installation of the trestle. Two artificial fish passage barriers upstream from the park have been identified. The Snohomish County MRC project (above) at Picnic Point will shed some light on the flooding and sedimentation problem at the upstream end of the railroad culverts.	**M**	**M**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
	9				No projects identified at this time				

Sub-Reach 9.04: Lunds Gulch

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M228	S9.04			**Lunds Gulch Culvert Improvement and Riparian Enhancement:** Project could take several forms. One option would be to implement Snohomish County's plan to replace the existing box culvert beneath the railroad with a wider box culvert as described in the Puget Sound Tributaries Drainage Needs Report. This project plan also includes riparian vegetation enhancement above and below the culvert, creation of an off-channel pond in the park, and placement of large woody debris in the pond. A second project option would be to replace the existing box culvert with a trestle to restore connectivity, improve sediment transport, and reduce flow-dependent fish passage problems. Project could also explore the potential for marine riparian vegetation restoration/enhancement on the beach side of the tracks, including potential beach nourishment opportunities. County park includes approximately 1050 ft. of shoreline.	$433,000 for the proposed Snohom. County Project	Lunds Gulch in the least developed creek basin in the Nearshore subarea, and according to the EDT results has the highest potential for improved Coho habitat productivity. The off-channel pond would help reduce stream flooding and provide high flow fish refuge. There is a history of riparian vegetation enhancement upstream in the watershed. The site also has potential for public involvement/education opportunities.	**M**	**M**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M229	S9.04			New	**Meadowdale Marina Acquisition and Removal:** Acquire and remove the dilapidated marina structure. The site is a total of 2.17 acres, with the buildings/wharfs representing approx. 1.7 acres of over-water structures.	land value ~$300,000 demo ~$200,000	Current owner would like to re-build the property and turn it into a retail shopping mall, but this is inconsistent with Edmonds Shoreline Master Program. One of the largest remaining over-water structures in the WRIA 8 nearshore. Feasibility uncertain due to landowner unwillingness. Potential concern over contamination issues during demolition. Dense eelgrass beds are located north and south of the structure. The marine nearshore habitat impacts of this structure include shading within a productive eelgrass area and potential interference with juvenile salmon migration and foraging along the shoreline. Removal of marina structures may also have positive effects on longshore drift of sediment. Timing may be good for approaching landowner before re-development begins.	**M**	**M/L**

Sub-Reach 9.08-9.09: Shell Creek

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M230	S9.08-09		New	**Shell Creek Beach Nourishment:** Conduct beach nourishment activities at the mouth of Shell Creek near Yost Park.		Although Sound Transit is not pursuing this option as part of its nearshore mitigation for the Seattle-Everett Commuter Rail Project, this option received positive scores on all physical and biological evaluation criteria. This beach rehabilitation option could also expand the high tide beach area available for backshore vegetation enhancement and public use. Site was identified as 2nd best opportunity for beach restoration potential by Sound Transit. Concerns expressed about the need for sustained effort to maintain beach nourishment projects (this reduces feasibility). Few examples of beach nourishment have been attempted in the area, and pilot projects are needed to evaluate their utility. A potential source of sediments for this or other beach nourishment projects is dredged materials from the Duwamish or Snohomish Rivers and delta. Dredging planned in these areas by the U.S. Army Corps of Engineers.	**M**	**L**
M231	S9.08-09		New	**Shell Creek Culvert Replacement:** Replace the existing culvert where Shell Creek crosses the railroad with a trestle to restore connectivity and improve sediment transport.		Good quality wetland habitat exists upstream of the culvert that could be more accessible if culvert replaced.	**L**	**L**
M232	S9.08-09			**Bracketts Landing Park Vegetation Enhancement:** Riparian vegetation enhancement at Bracketts langing including addition of low-growing trees. There is an invasive species problem just to the north of the site. Further enhance the marine riparian vegetation by adding native plants to existing backshore areas and removing non-native invasive plants where appropriate and compatible with existing park uses.		One of Snohomish County's largest kelp beds extends north from Edmonds Underwater Park. Surf smelt and sand lance spawning has been documented along Olympic Beach and Brackett's Landing. The southwestern two-thirds of Olympic Beach is modified by a sea wall. The City of Edmonds owns all but 100 feet of the tidelands in this shore unit and about two-thirds of the adjoining upland property. The City of Edmonds has established small parks with public shoreline access on both sides of the ferry terminal. These park improvements include some native marine riparian vegetation.	**L**	**H**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
	S9.08-09				No projects identified at this time				

Sub-Reach 9.15: Willow Creek

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M233	S9.15		New	**Willow Creek Daylighting:** Proposed mitigation project for nearby "Edmonds Crossing" development (including new ferry terminal). Daylighting creek through existing fuel pier (using box culverts) will improve connectivity with the Willow Creek Marsh, one of the largest remaining marsh areas in the WRIA 8 nearshore.	$250,000	Possibility of also restoring vegetation at the outfall of Willow Creek as well. Good opportunities for public education at this site.	**H**	**H**
M234	S9.15		New	**Willow Creek Pier Removal:** Demolition of existing pier as part of mitigation for new ferry terminal.	$350,000	Potential concern over contaminated materials at the site.	**M**	**H**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
	S9.15				No projects identified at this time				

Reach 10A: Edwards Point to Meadow Point

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M235	10A		New	**Woodway Tidal Lagoon North:** Potential culvert improvement project at an inter-tidal lagoon and mud flat where railroad was built offshore South of willow creek.		Potential fresh water seepage into lagoon could make for good shallow water habitat. Site should be investigated further, as little is currently known. Sound Transit is scheduled to conduct track improvements (widening) at the site soon, and culvert improvements or other accommodations could potentially be designed in to the project to improve connectivity of lagoon to nearshore. Potential Sound Transit mitigation site.	**H/M**	**H**
M236	10A		New	**Deer Creek Restoration or Culvert Replacement:** Enhance the connectivity of Deer Creek and the associated estuarine wetland with the nearshore by replacing the two concrete culverts with an oversized culvert or a trestle bridge. Sound Transit will be conducting some mitigation at this site for proposed track improvements including either vegetation enhancement OR the replacement of the existing culvert with a trestle.		This option was considered by Sound Transit for its mitigation plan, but it was rejected for cost and logistical reasons. Site hosts several small tidal lagoons upstream of tracks that could be improved. Significant amount of forested area in basin. Deer creek is too steep for fish passage. Some individuals expressed concern over installing a trestle on this site, which may actually eliminate the lagoon upstream of tracks. Several participants felt that this was probably not the best site for a trestle. Concern was also expressed about water quaility from road runoff at the site being a threat to juvenile fish.	**H/M**	**H/M**
M237			New	**Point Wells Complete Site Restoration:** Restore the entire Point Wells site by completely removing the sea wall, riprap dike, and fill. Regrade the site and reconnect local freshwater sources to re-create a tidal lagoon system with an opening at the north end of the point, which was probably the original mouth of the tidal lagoon system. Reestablish native riparian and backshore vegetation.		Point Wells is within Snohomish County jurisdiction and the current land use designation is “Rural Use.” The future land use designation is “Urban Industrial.” The site is proposed for annexation by the City of Shoreline or the City of Woodway and the City of Shoreline has shown interest in the site for commercial development. The northern part of this site is the preferred alternative for siting the Shoreline commuter rail station.	**H**	**L**

M238	10A		New	**South Point Wells Habitat Restoration**: Enhance the south shoreline by removing riprap dike, eliminating invasive plants, and reestablishing native riparian and backshore vegetation.		The south shoreline is approximately 800 feet long, has sandy substrate, supports some beach grass and other herbaceous vegetation, and includes a fair amount of large woody debris. Point Wells is within Snohomish County jurisdiction and the current land use designation is “Rural Use.” The future land use designation is “Urban Industrial.” The site is proposed for annexation by the City of Shoreline or the City of Woodway and the City of Shoreline has shown interest in the site for commercial development. The northern part of this site is the preferred alternative for siting the Shoreline commuter rail station. The south shoreline, with its proximity to nearby residential areas, has potential value for public access.	**H/M**	**M/L**
M239	10A		New	**South Point Wells Lagoon Creation:** Creation of a three acre inter-tidal lagoon at the south end of the Point Wells site that may have historically been a marsh (before it was filled).		The south shoreline is approximately 800 feet long, has sandy substrate, supports some beach grass and other herbaceous vegetation, and includes a fair amount of large woody debris. The “functional/ecological viability” of this option was rated high by Sound Transit’s Mitigation Task Force. Sound transit had negotiated this as a mitigation site with Chevron, but they have backed out at this point, potentially due to contamination concerns on the site. Regardless, this could be a good future mitigation site, as it is part of the Chevron property not being utilized. This site will also be very close to the location of the outfall from the new Brightwater sewage treatment plant. There may be some (likely small) mitigation requirements that go along with the siting of this outfall.	**H/M**	**M/L**
M240	10A		New	**Richmond Beach North Property Acquisition:** Acquisition, demolition, and restoration of shoreline where numerous (30+) homes that are built in the nearshore north of Richmond Beach park.		Would be a very expensive project.	**H/M**	**L**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M241	10A		Y	New	**Deer Creek Habitat Acquisition:** Preserve the existing riparian vegetation, stream outfalls, and unmodified shoreline along the southern portion of the Deer Creek outfall area.		This site includes two shore units north of Point Wells. It is within the City of Woodway. The southern portion of this site is a high quality remnant riparian area with several small freshwater outfalls that flow across the unmodified beach face. A wide eelgrass bed extends north from this beach and covers much of the adjacent low tide terrace. Forest cover in the Deer Creek drainage basin is relatively intact and much of the riparian area along the stream is owned by the Olympic View Water District. Sound Transit is planning to reestablish the second railroad track along this segment up to Edmonds. This "corridor improvement" will include some additional filling of the estuarine wetland on the east side of the railroad and the Deer Creek culverts will be extended 15 – 25 feet on the upstream side.	**M/L**	**M**
M242	10A			New	**Point Wells North Habitat Acquisition:** Acquisition and protection of a very small (~ 1 acre) remnant piece of marine riparian habitat exists on the north side of Point Wells. Despite the proximity to the Point Wells site, it would be a valuable piece to protect. Approx. 850 ft of shoreline.		Landowner unknown. Small site and proximity to Point Wells may make acquisition very difficult to find funding for.	**M**	**M**

Sub-Reach 10A.10: Boeing Creek

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M243	S10A.10		New	**Barnacle Creek Wetland Construction:** Create tidally influenced wetland habitat on the east side of Burlington Northern Railroad Tracks at Barnacle Creek.		Proposed by City of Shoreline	**L**	**L**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
	S10A.10				No projects identified at this time				

Sub-Reach 10A.12: Pipers Creek

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M244	S10A.12			**Pipers Creek Culvert Replacement:** Replace the existing culvert under the railroad with a trestle to restore connectivity and improve sediment transport.		Coho and chum have fish passage problems upstream, and it seems as though fish are currently getting to the areas that are accessible to them. Project may not create or make available much habitat for Chinook, as the creek is primarily used by coho/chum. Active community group in the area has done a lot of riparian, mass wasting, and drainage work. Opportunity exists for lots of public education and to dovetail project with work of community group. Culvert may not be as undersized as others in the area, as it seems to be transporting significant sediment. BNRR has been resistant to proposals for modify the culverts at this site in the past due to cost and potential for interrupting train traffic during construction.	**M**	**M**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
	210A.12				No projects identified at this time				

Reach 10B: Meadow Pt to Shilshole

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M245	10B			**Golden Gardens Pocket Estuary:** Explore creation of pocket estuary at Golden Gardens Park (owned by Seattle Parks) that juvenile fish can access. The north end of the park has a perched wetland area that has a great deal of flat land that could be converted to a more substantial wetland complex. North end of the park could be modified to allow fish to have access to the wetland.		Creating fish access would likely take a permanent engineering solution that fights with natural sediment processes. Is closest area of flat land near locks that could serve this function. The feasibility of providing a naturalistic hydraulic connection between the marsh and the open water of Puget Sound would be a huge challenge in this environment due to the fluid nature of the beach material. Historically, the entire beach area did not exist, so there is no history of estuary in this area. Given that the current wetland is a relatively recent and expensive addition to the park, there may be significant public and political resistance to changing it. Lots of opportunity for public education.	**M**	**L**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
	10B				No projects identified at this time				

Reach 11: Shilshole to Locks (Estuary Reach)

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M246	11		new	**Azteca/Golden Tides Restoration:** Acquire and restore the Azteca/Golden Tides site at the entrance to Salmon Bay from Shilshole Bay. The project envisions removing over-water structures and possibly part of the Ray's Boathouse dock to expose a large stretch of shoreline, including the NW 60th Street End Park, for habitat restoration and public access. Pilings should be removed, and riprap removed where it has fallen into the water. Project could include removal of floating dock and bait pens on the north shoreline of Shilshole Bay. Dock and pens are under lease from the U.S. Army Corps of Engineers. There may be an opportunity to create forage fish spawning habitat.		Project identified by Groundswell NW. King County CFT funds awarded through the Shorelines Initiative could provide seed money. The high visibility of the site makes it ideal for interpretive elements. Good public education/outreach benefits.	**M/L**	**M**
M247	11		1	**Salmon Bay Natural Area:** Increase rearing/refuge area for millions of salmon smolts that migrate through and use this transition area between freshwater and saltwater. As proposed, project goals would be to acquire the property, plant native shoreline vegetation, remove riprap, re-slope shoreline, and add gravel/sands where appropriate. The Salmon Bay Natural Area is downstream of the Hiram M. Chittenden Locks on the north bank between Hiram's restaurant and the railroad bridge, and behind the U.S. Army Corps of Engineers' finger pier. Project partners include Groundswell Northwest, City of Seattle, and U.S. Army Corps of Engineers.		Acquisition funded and nearly complete. Upland restoration in process. In-water restoration in-design. National Fish and Wildlife Foundation, KCD, Seattle Public Utilities, ALEA, Neighborhood matching grants. Mitigation funding may be used for removal of over-water structures (dock and house). Riprap has fallen into the water. Uncertainty about funding available for riparian restoration. Good public education benefits.	**M**	**H/M**
M248	11		2	**36th Ave. NW Street End on Salmon Bay:** Increase rearing/refuge habitat for juvenile salmon by restoring the conditions at this site, which is located downstream of the Salmon Bay Natural Area just west of the railroad bridge. Alternative bank protection measures would be used to create a more gradual slope. In addition, riparian and emergent vegetation could be planted, and the substrate could be amended to restore nearshore habitat. Site includes approximately 70 ft. of shoreline.		In Process - City of Seattle. Small area. The adjacent property owner has applied for permits to rebuild the bulkhead. The property is publicly owned; therefore, funds would be needed for restoration, but not acquisition. Failed bulkhead exists with lots of rip rap and rubble in the water which should be removed. Project identified by Groundswell NW - they describe it as a modest project. May create a viewpoint on the bank above. Good public education benefits, not necessarily good benefits for fish.	**M/L**	**M**

M249	11		new	**Salmon Bay Dock Consolidation:** Work with dock owners/boat ramps to consolidate and reduce the number of docks and hardened structures, within Salmon Bay. Area is migration corridor. Docks, ramps and bank hardening change the inter-tidal plant/animal community (prey types).		Could include Ballard Bait dock and pen removal, where long-term lease is currently up for removal. Corps could refuse renewal of lease and could also assist with costs associated with dock removal. Ballard Bait dock is largest overwater structure between the RR Bridge to Azteca. Good public education benefits.	**M**	**M/L**
M250	11		3	**Commodore Park and Wolfe Creek Restoration:** Explore feasibility of habitat restoration at Commodore Park, located immediately downstream of the Hiram M. Chittenden Locks on the south bank. Purpose of the project would be to increase the limited high-quality rearing/refuge habitat for millions of salmon smolts that migrate through and use this area as a critical transition between freshwater and saltwater. Armored seawall should be removed and restored to a more gentle vegetated slope. Project could be combined with daylighting of Wolfe Creek to create a pocket estuary downstream of the locks. Park recreational use should be maintained.			**H/M**	**L**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
	11				No projects identified at this time				

Reach 12: North Discovery Park to West Point

Restoration

Technical Hypothesis:

Project #	Reach #	Reach Restor. Benefit Rank	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
M251	12			**West Point Pocket Estuary:** Explore creation of pocket estuary at West Point (owned by King Co. DNRP (WTD)). This area used to have some form of salt marsh that appears to have allowed fish access (Seattle Tide Land Map 1895). Currently there is a skinny, long, perched wetland between the bulkhead and the facility. It seems like it would be possible to expand the length of this wetland (towards the lighthouse) and come up with a permanent engineering solution to allow fish access.		This area is far less substantial in area that is usable than the Golden Gardens site, but it still might be enough to help out. Site is currently not tidally influenced. A heavily engineered solution would be required to maintain such an estuary, but it is one of the few opportunities available. The existing wetland is at a higher elevation than the Golden Gardens site. As such, any saltwater wetland may have to have a steep sided channel rather than a flat gradient mud flat type of marsh environment.	**M**	**L**
M252	12			**Shilshole Bay South Buyout and Restoration:** Project would buy out homes on the south side of Shilshole Bay, demolish the homes and restore the nearshore. This area extends from the "Dolphin 8" buoy to points south. All of these homes and their hardened shorelines are affecting the shallow water migration corridor, feeding area, etc.		One of the few nearshore areas in WRIA 8 without the railroad so it should be considered a feasible opportunity for buyout and restoration.	**H**	**L**

Protection

Technical Hypothesis:

Project #	Reach #	Reach Prot. Benefit Rank	Existing Prot. Priority (Y/N)	NTAA #	NTAA Name & Description	Approx. Cost	Notes, Key Uncertainties	Benefits to Chinook H, M. L	Feasib. H, M, L
	12				No projects identified at this time				

Draft Proposed Outreach & Education Actions for Ship Canal/Locks/Lake Union (by WRIA 8 Public Outreach Committee)

Proj #	Habitat Condition	Desired Outcome	Target Audience	Proposed Action	Priority	Proven Track Record or Model	Level of Financial Commit.
M701	Solid overwater structures that create dark shadows and hiding places for predators	Reduce severity of predation on juveniles	Dock owners, via boat owners, shoreline property owners	Create a boater education campaign. Explain about value of mesh docks, smaller piling sizes, and community docks to both salmon and property owners. (Reduced predation for fish; reduced maintenance for property owners. Highlight added value being able to watching fish swimming under the dock and architectural styling of raised approach bridges). Outreach could be carried out via a combination of mailings sent with boat registration tab renewal or property tax notice (for shoreline property owners), literature at marine, sporting goods, and hardware stores; boat shows; and through workshops to homeowners and marine construction industry. Coordinate outreach through appropriate licensing and tax agencies.	High (for Lake Union)		Variable
M702	Increased predation under older style solid surface docks, or new docks built/remodeled without proper permits and design specs	Expedite permitting to get better compliance and consequently, more salmon friendly shoreline construction	Shoreline property owners, marina operators, houseboat community	Increase public awareness about the joint effort by NOAA Fisheries, Washington Dept. of Fish & Wildlife, US Army Corps of Engineers, US Fish & Wildlife Service to develop more standardized specifications for new and expanded piers. Highlight fact that goal of this effort is to streamline federal/state permitting for piers that meet these specifications.	High		Low
M703	Increased predation in areas with docks and overwater structures, decreased water quality	Reduce predation, remove source of creosote degrading water quality	General public, but especially other shoreline property owners	Increase interpretive signage and media exposure at areas where dock, pilings, and overwater structures have been removed.	High	Salmon Bay Natural Area, (e.g. Azteca Restaurant site)	Low
M704	Rip-rap and shoreline armoring that encourages predator species	Remove and replace with more natural features, encourage more salmon friendly design for new	Shoreline property owners	Offer shoreline property owners a series of shoreline design workshops that cover: natural yard care; shoreline planting design/noxious weed management; alternatives to vertical wall bulkheads; salmon friendly dock design; aquatic weed management; environmentally friendly methods of maintaining boats, docks, decks; porous	Low - Medium	Natural Yard Care Program, WRIA 8 Lakeside Living Lakeshore Property Owner	Medium High

Proj #	Habitat Condition	Desired Outcome	Target Audience	Proposed Action	Priority	Proven Track Record or Model	Level of Financial Commit.
		construction		paving options.		workshops	
M705	Rip-rap and shoreline armoring that lead to coarse aggregate and steep slopes	Decrease conditions that favor predator species	Construction and design industries	Offer professional workshops to marine contractors and design professionals on more environmentally friendly shoreline design.	High	Wa Assoc. of Landscape Contractors Integrated Pest Mgmt. trainings	Low
M706	Rip-rap and shoreline armoring that encourages predator species	Reduce these conditions and soften shoreline	Boat owners	Expand outreach related to impacts of increased boat speed near shorelines, especially those caused by the new super yachts. Shoreline property owners are reacting by trying to build increasingly bigger and less salmon friendly bulkheads. If there need to be speed limits established and increased regulation within a certain distance of shoreline, boaters will have to better understand the implications of increased speeds caused by larger boats. Coordinate with the Washington State Dept. of Licensing to send messaging through boater registration renewal notices; also have explanation or hyperlink available on DOL website. Also requires coordination with Coast Guard, police, and proper enforcement agencies. Have outreach materials available at gas docks, marinas, and marine supply stores.	Medium - High		Variable with inter-agency cooperation
M707	Lack of riparian vegetation; shorelines lack any vegetation or are predominated by invasives or exotics with low ecological value	Replace with appropriate shoreline vegetation	Local business community	Coordinate with local businesses to sponsor a re-vegetation campaign, incorporating environmental stewardship as part of redevelopment occurring within Ship Canal area. Extend message and sponsorship through signage along shore, as well as retail self-promo (at business's discretion). Promote through media on larger level with articles and recognition, Daily Journal of Commerce, local papers, trade journals, and at business club meetings such as Propeller Club and Chambers of Commerce.	High	Salmon Bay Natural Area; (former Hiram's Habitat Improvement Project), Marine Business Coalition; Improvement Districts; Business Improvement Areas	Low
M708	Water quality	Protect and	Local	Expand and extend Best Management Practices to all	High	Various	Low -

Proj #	Habitat Condition	Desired Outcome	Target Audience	Proposed Action	Priority	Proven Track Record or Model	Level of Financial Commit.
	degraded by cleaning products/chemicals poured down storm drain or through parking lot cleaning	restore water quality	business community, property management companies	business, especially at service and janitorial levels and through property maintenance techniques. Consider different language options for ESL employees. Further coordinate with employment and temporary agencies. Expand EnviroStars program to include salmon friendly BMPs.		jurisdiction's community, stormwater management, and business outreach programs; KC EnviroStars	Medium
M709	Elevated water temps due to increased impervious areas reduced infiltration and groundwater recharge lower flows	Reduce high water temp that impede juvenile outmigration	General public, especially high water users	Develop marketing campaigns such as *Keep Cool*, *Salmon are Shady Characters*. Continue to promote existing "Cold Fish need Love too" (Bellevue Stream Team). Promote cool water as an important benefit of water conservation.	Medium	Bert the Salmon ad campaigns, pro bono ad work, The Campaign for a Drug Free America	Variable. Can be low if get pro bono advertising work
M710	High water temps. lead to increased predation	Reduce water temp by increasing baseflows	General Public, especially high water users	Increase water conservation campaigns promoting the use of more efficient appliances and water use practices. Expand for landscape irrigation purposes. Offer free landscape irrigation audits for high water users.	Low	Water Cents, Smart & Healthy Landscapes	Low
M711	Degraded water quality	Improve and protect water quality	Marinas, sea plane docks, boat yards	Promote use of less toxic materials used for maintenance and repairs.	High	King County Local Hazardous Waste Mgmt. Program	Low - medium
M712	Degraded water quality, chemicals masking smell receptors used to navigate home to spawning grounds	Improve and protect water quality	Landscape contractors, property mgmt. companies	Train groundskeepers and property management companies about water polluting effects of landscape practices. Employ the "pride in workmanship" strategy. Put signs up listing who maintains landscapes and parking lots along the canal and the Locks and the management practices which they employ.	High	Ongoing throughout WRIA	Low - medium
M713	All conditions listed above	Remediate these degraded conditions and protect water quality	Houseboat community, "Liveaboards" on navigable boats, and recreational boaters	Expand outreach about shoreline vegetation, aquatic weed Best Management Practices, and water quality (pump-outs). Messaging should occur through homeowner's association meetings and newsletters. Appeal to "liveaboards," through boater registration.	Medium	Existing work with many houseboat communities (e.g. Mallard Cove).	Low

Draft Proposed Outreach & Education Actions for Estuary & Nearshore (by WRIA 8 Public Outreach Committee)

Proj #	Habitat Condition	Desired Outcome	Target Audience	Proposed Action	Priority	Proven Track Record/Model	Level of Financial Commit.
M714	Solid overwater structures that create dark shadows, sudden light changes, hiding places for predators, and force juveniles out into deeper water where more predators lurk	Reduce severity of predation on juveniles, protect schooling behaviors, and reduce disorientation caused by sharp changes in light intensity	Shoreline property owners and dock owners, via boat owners	Promote mutual value of mesh docks, smaller piling sizes, and community docks to both salmon and property owners. (Reduced predation for fish; reduced maintenance for property owners. Highlight added value being able to watching fish swimming under the dock). Outreach could be carried out either by direct mailing to shoreline property owners or via development of a boat owner education campaign. Outreach messages could be sent with boat registration renewal or property tax notice. Augment with literature at marine supply/sporting goods stores, boat shows; and through workshops to homeowners and marine construction industry. Coordinate outreach through appropriate licensing and tax agencies. Coordinate outreach with marine contractors and manufacturers of mesh decking, prisms, light tubes, and other components employing newest technologies.	High	Yes	Variable
M715	Increased predation under solid surface docks built close to water, with large and numerous pilings. Docks replaced or built without proper permitting due to cumbersome requirements and time taken to process.	Expedite permitting to get better compliance and consequently, more salmon friendly shoreline construction	Shoreline property owners, marina operators	Support through public outreach the joint effort by NOAA Fisheries, WDFW, USACOE, USFWS to develop consistent specifications for shoreline modifications such as new or expanded piers and bulkheads. Goal of this effort is for streamlined federal/state permitting for piers that meet these specifications. Message through direct mailings to shoreline property owners or piggyback with property tax notices. This would require coordination with Tax Assessors office. Explore possibility of creating further incentives for dock sharing such as reduced permit fees and super expedited process.	High		
M716	Segmentation of shoreline acting as barrier to habitat forming processes	Re-establish shoreline continuity and encourage sandy beach formation	Shoreline property owners	Promote use of shared docks, buoy anchors, or removable docks. Explore possibility of incentives for dock sharing such as reduced permit fees and super expedited process.	High - Medium	San Francisco Bay and Chesapeake Bay	

Proj #	Habitat Condition	Desired Outcome	Target Audience	Proposed Action	Priority	Proven Track Record/Model	Level of Financial Commit.
M717	Predation in areas with docks and overwater structures; decreased water quality	Reduce predation, remove source of creosote degrading water quality	General public, but especially other shoreline property owners	Increase interpretive signage and media exposure at areas where dock, pilings, and overwater structures have been removed.	Medium - Low	Nearshore parks, City of Edmonds and future ferry dock relocation, Edmonds.	Low
M718	Lack of marine shoreline vegetation; shoreline armoring and docks that encourage predator species, reduced water quality	Restore marine vegetation; replace hardened shoreline with more natural features; promote more salmon friendly design for new construction	Shoreline Property Owners, marine contractors	Offer shoreline property owners a series of shoreline design workshops that covers: shoreline planting design/noxious weed management; slope stabilization and erosion control using vegetation; natural yard care; porous paving options; alternatives to vertical wall bulkheads; salmon friendly dock design; and environmentally friendly methods of maintaining boats, docks, and decks. Offer professional workshops to marine contractors and design professionals on more environmentally friendly shoreline design.	High	Puget Sound Action Team & WRIA 9 nearshore property owner workshops; WRIA 8/KCD Lakeside Living Lakeshore property owner workshops; People for Puget Sound Nearshore Pods Program, Natural Yard Care Neighborhoods Program	Medium High
M719	Shoreline armoring that prevents beach accretion by limiting sediment source	Reduce shoreline hardening; connect sediment source to Nearshore	Shoreline property owners	Create an education campaign to explain to shoreline property owners the problems associated with vertical wall bulkheads. Besides workshops described above, use direct mailings to shoreline prop owners, guided beach walks; and messaging with property tax notices, and websites.	High - Medium	Puget Sound Action Team, People for Puget Sound	Low
M720	Lack of pocket estuaries	Restore and enhance creek mouths	Shoreline Property owners, real estate professionals, general public	Expand outreach about value of estuaries for rearing, food, shelter, and salinity adjustments for migrating fish. Encourage private property owners to enlist help of community stewardship organizations to help restore and enhance creek mouths, and to provide means for ongoing education. Build on/modify the Adopt-a-Park system to adopt a creek mouth.	High -	Seattle Creek Stewardship Program, Seattle Adopt-a-Park, Lake Forest Park Stewardship Foundation,	

Proj #	Habitat Condition	Desired Outcome	Target Audience	Proposed Action	Priority	Proven Track Record/Model	Level of Financial Commit.
				Appeal to real estate business community to help foster this ethic of community stewardship. Explore possibility of involving neighborhood schools.		various city stream teams	
M721	Decrease in eelgrass beds due to shoreline armoring (impeding sediment supply), overhanging docks/structures; pollution, propeller disturbance, turbidity, dredging, and filling	Restore eelgrass bed and source of refuge, food, and nutrient supply	Shoreline property owners, boaters, community, youth	Expand outreach about value of eelgrass beds as juvenile source of food and habitat and the negative effects that docks, overwater structures, and bulkheads have on the eelgrass. Encourage combined docks or mesh/nearshore friendly designs that let more light down into water and impede less sediment. Involve community and youth in eelgrass replantings and monitoring studies.	High	US EPA's National Estuary Program	Low
M722	Lack of riparian vegetation; shorelines lack vegetation or are predominated by invasives or exotics with low ecological value	Replace with appropriate shoreline vegetation	Local business community and shoreline property owners	Coordinate with local businesses to sponsor a shoreline revegetation campaign, incorporating environmental stewa as part of shoreline commerce. Extend message (and sponsorship) through signage along shore, in-store or resta promotions (at business's discretion), and media recognitic Promote on larger level with recognition, Daily Journal of Commerce, local papers, trade journals, Chambers of Commerce.	Medium	Salmon Bay Natural Area, Hirams at the Locks Habitat Improvement Project, Seattle Local Improvement Districts and Business Improvement Areas.	Low
M723	Loss of marsh and wetland	Protect marsh and wetland habitat	General public	Increase interpretive signage at Golden Gardens and public wetland sites. Encourage school field trips.	Medium	Golden Gardens Park, North Creek Regional Park	
M724	Railroad as impediment to feeder bluffs and habitat forming processes	Where ever possible protect source of sediment formation	Shoreline (largely Railroad) and upland bluff property owners, general public, youth	Develop an education awareness campaign: *Have you fed your beach today?* Define what feeder bluffs are. Challenge the notion that all erosion is a bad thing.	Medium - Low		Variable
M725	Water quality degraded by toxics	Protect and improve water	Home and car owners, storm	Promote use of more Low Impact Development and innovative storm water management solutions for dealing	High	Seattle SEA Streets, High	Variable, but

Proj #	Habitat Condition	Desired Outcome	Target Audience	Proposed Action	Priority	Proven Track Record/Model	Level of Financial Commit.
	and metal fines	quality by mimicking natural hydrology	water management planning, staff, developers	with runoff by using more small scale natural drainage systems, reducing impervious surface area, and increasing amount of vegetative cover.		Point Development, Cities of Bellingham and Portland	muchchea per than traditional solutions
M726	Water quality degraded by toxins and heavy metals	Reduce use of petroleum combustion engine cars	General public, but especially car owners, drivers, and students	Make better known the connection between water pollution and the everyday act of driving cars. Pose questions such as "What happens to car exhaust – all the things that come out of the tailpipes? Where do worn tires, breaks, and other car parts go? Expand outreach to school Driver's Ed programs (the future car buyers of our watershed) and school science curricula. Coordinate messaging with Puget Sound Air Quality Authority. Enlist help of the auto industry to help subsidize outreach by touting what they are doing to reduce emissions and capture combusted aromatic hydrocarbons. Support Commute Trip Reduction Programs.	High	Water Quality Consortium Poster Series, PSAT, Business for Clean Water Washington Forest Protection Association	Medium
M727	Water quality degraded by cleaning products/chemicals poured down drain (tossed directly into storm drain or in parking lot)	Improve and protect these conditions	Local business community, property managers	Educate and support businesses, property management companies, and homeowners associations on stormwater t management practices, specifically related to parking lot cleaning, storm drain maintenance and road cleaning. Consider different language options for ESL employees. Further coordinate with employment and temp agencies. Expand EnviroStars program to include salmon friendly BMPs.	High - Medium	Various jurisdiction's community, storm water management, and business outreach programs	Variable
M728	Improve and protect water quality	Improve and protect water quality	Boat yards, sea plane docks, and marinas	Promote use of less toxic materials for cleaning and maintenance. Focus more efforts at marinas and places where 'do-it-yourselfers" would be since they may be less aware of impacts and are not as regulated as marine industries.	Medium	King County LHWMP, Puget Sound Keeper, Puget Sound Alliance	Low-medium
M729	Degraded water quality, chemicals masking smell receptors used to navigate home to	Improve and protect water quality	Landscape contractors, property management companies,	Train groundskeepers, Parks Departments, and property management companies about water polluting effects of landscape practices. Employ the "pride in workmanship" strategy by placing signs that list who (the company, dept. or agency that) maintains landscapes/parking lots	Medium	Ongoing throughout WRIA. King County Local Hazardous	Low-medium

Proj #	Habitat Condition	Desired Outcome	Target Audience	Proposed Action	Priority	Proven Track Record/Model	Level of Financial Commit.
	spawning grounds and degrading eel grass beds			along shorelines and the management practices which they employ.		Waste Mgmt Program, Seattle Green Gardening. King County LHWMP EnviroStars recognizes businesses that adopt BMPs	
M730	All above conditions	Protect and restore nearshore salmon habitat and habitat creating processes	Shoreline property owners	Distribute printed materials such as the *Shoreline Property Guidebook* (also available online) to all shoreline property owners in order to provide household and landscape best management practices, as well as information about opportunities for involvement in community stewardship projects.	High- - Medium	Puget Sound Action Team	Low