



West Sound Watersheds Council 2010 Three-Year Work Plan Update

Salmon recovery involves a complex set of actions and interactions that are both directed by the Recovery Plans and by the reality within each watershed. The three year work plan is one tool used to reflect those complex interactions.

The purpose of the work program update is four-fold: 1) to provide a forum for watershed groups, the Recovery Implementation Technical Team (RITT), and Puget Sound Partnership (PSP) staff to discuss the work, status, and needs of salmon recovery in each salmon recovery watershed chapter and regionally; 2) to have a tool that documents the work, status, and needs of salmon recovery per each salmon recovery watershed chapter for the next three years that can be rolled up into a regional statement of the funding and capacity needs, current status, and existing work underway; 3) to be a tool for identifying priority projects for current and future funding opportunities; and 4) to document changes in the implementation of each salmon recovery watershed chapter.

The components of the 3 Year Work Plan are a spreadsheet of priority projects and programs that can be started within three years (2010, 2011, 2012), and a narrative. The narrative describes the progress, changes, and status of recovery implementation and the work program since the previous year's update.

Spread sheet of Priority Projects and Programs

This spreadsheet is attached as an excel file. For more information about many of the projects, including photos, maps and project sponsor information, please see the Habitat Work Schedule site at:
<http://hws.ekosystem.us>

Narrative

1. What are the actions and/or suites of actions needed for the next three years to implement your salmon recovery chapter as part of the regional recovery effort?

The primary hypothesis that forms basis for the suites of actions proposed in this update is that the **nearshore habitat is the highest priority for investment** in this lead entity. Most of the projects and programs proposed in the next three years are targeted at protecting or restoring quality nearshore habitat.

Additionally we intend to extend our documentation of existing freshwater ecosystems through the water typing in selected West Sound streams. We have begun in the North Kitsap area in May 2010, chosen because of the desire to preserve forest and wetland ecosystem connectivity and the potential for large scale land use changes.

2. What is the status of actions underway per your recovery plan chapter? Is this on pace with the goals of your recovery plan?

We did not have 10 year goals not identified specific actions in the *Salmon Recovery Plan*. We believe that the Action Agenda adopted in December 2008 identifies many goals that will serve us in future planning endeavors.

We have made significant strides with regard to the documentation of the restoration needs and other recovery actions through the Habitat Work Schedule (HWS). This tool has been adopted eagerly by most project sponsors, and most are getting comfortable with entering and maintaining information about projects.

The lead entity would like the Partnership and NOAA fisheries to formally include the attached document: ***East Kitsap WRIA 15 Salmon Recovery Planning Implementation and Habitat Analysis Matrix*** as a part of the East Kitsap Chapter of the Plan. This document also applies to the South Sound nearshore portion of the lead entity.

3. What is the general status of implementation towards your habitat restoration, habitat protection, harvest management, and hatchery management goals?

Habitat Restoration:

Chico Creek:

The Chico Creek instream restoration project phase 1 was completed in 2008 and phase 2 will be completed in 2010. This instream restoration project was begun in 2004, prior to the shift to a nearshore focus because of the adoption of the Recovery Plan. Chico Creek is the most productive salmon stream (all species including steelhead and some stray Chinook) on the Greater Kitsap Peninsula, and is the largest freshwater stream in Dyes Inlet.

This instream restoration is taking place in the lower mile of the watershed, on a private golf course that has been channelized since 1924.

The largest restoration planned in our watershed is opening the Chico Creek estuary. Washington State DOT (WSDOT) built Highway 3 in the early 1960's, primarily as a link between the Naval Shipyard in Bremerton and the Bangor Submarine Base on northern Hood Canal, as directly as possible. To that end, they filled the salt marshes and the estuary, and put the creek in 2-8 foot wide, approximately 500 foot long culverts and channel. The culvert under Hwy. 3, and at the County's Kitty Hawk Road, just downstream, are partial fish barriers with one of the state's highest "Priority Index" for fish passage. Planning is well underway to replace the Highway 3 culvert with a large bridge, led by the WSDOT. The first steps in the restoration of the Chico Estuary were recently funded through the US Navy and the EPA, led by the Suquamish Tribe. Construction to remove the Kitty Hawk culvert should take place in 2011.

Carpenter Creek:

This is a straight forward project that was identified and funded in 2002 by the SRFB and the US Army Corps of Engineers, near Kingston, in Central Puget Sound. The Washington Dept. of Fisheries installed an 8 foot tide gate at this location as a satellite "fish farm" in the late 1950's. There was, and still is, a fairly pristine 26 acre shallow estuary at this site, obvious habitat for juvenile migrating salmonids. The fish farm didn't prove to be workable, and the tide gate has remained in place, restricting tidal flow and stranding salmon and other species inside the culvert for almost 50 years. The plans are to replace the culvert with a 90 foot. This project was included in the 2010 legislative capital budget and construction will begin in late 2010.

Misc. Nearshore:

There are several fully funded nearshore restoration projects on Bainbridge Island that are in final design and should be completed in the next 3 years. There are also nearshore projects in conceptual or early design phases proposed in all the East Kitsap Peninsula inlets, the Gig Harbor and Key Peninsulas, and most of the islands in WRIA 15.

The lead entity has been discussing how to prioritize nearshore restoration and protection projects, but the projects continue to be more opportunistic than strategic. Kitsap County is poised to begin a "Regional Shoreline Restoration" grant funded by the EPA that will focus on the removal of shoreline armoring on both public and private lands.

Freshwater: We do not have funding available for the freshwater restoration projects that would protect the Puget Sound steelhead that are known to inhabit our small streams and bays. We do expect that the water typing project described above will help define the status and trends of the Kitsap steelhead.

Habitat Protection:

The Lead Entity was able to fully fund the SRFB request for acquisition of Devils Head at the southern point of the Key Peninsula, thanks to additional funding allocated from 3 of the 4 other South Sound lead entities. This pristine nearshore has been on the priority list for protection for many years, and will be acquired by Pierce County Parks and Recreation Services (original grant was proposed by the Cascade Land Conservancy). The cooperation and good will fostered by this sharing of financial resources for the greater South Sound is exemplary.

A large part of the habitat protection focus is on the Shoreline Management Plans updates, with all 5 cities (Bainbridge Is., Poulsbo, Bremerton, Port Orchard, Gig Harbor) and Kitsap County starting this process in 2009.

The Nearshore Assessment for eastern Kitsap County was funded in 2004 and was finished in 2009. It is currently being used by the shoreline planners in several jurisdictions to update their Shoreline Master Programs. The assessment will also inform the basis for another newly awarded EPA grant that Kitsap County and some of the cities will use for "Shoreline Alternative Futures Analysis".

We also are working more closely with our local land trusts (Bainbridge Island and Great Peninsula Conservancy) on conservation and restoration opportunities through easements and other tools for habitat protection.

Harvest and Hatchery Management:

We have no identified harvest or hatchery activities associated with the *Salmon Recovery Plan*, however we are starting to link habitat restoration projects with volunteers doing salmon spawning surveys (Bainbridge) and small scale hatchery supplementation to compliment small stream restoration (Bainbridge and Manchester).

The lead entity also plans to engage the Washington Dept. of Fish and Wildlife's Minter Creek Hatchery program staff in the planning and execution of habitat protection and restoration activities.

4. What are the top implementation priorities in your recovery plan in terms of specific actions or theme/suites of actions? How are these top priorities being sequenced in the next three years? What do you need to be successful in implementing these priorities?

Most of the projects and programs proposed in the next three years are targeted at protecting or restoring quality nearshore habitat. One specific and recurring theme for our priorities is: How do we utilize the nearshore assessment information data sets for prioritizing future projects? We do know that this is a consistent theme in other nearshore focused watersheds, and hope to work more broadly than this geographic area on this topic.

What we need to accomplish these goals is consistent funding for coordination of actions, and technical support for local jurisdictions.

5. Do these top priorities reflect a change in any way from the previous three-year work program? Have there been any significant changes in the strategy or approach for salmon recovery in your watershed? If so, how & why?

There have not been any significant changes.

6. What is the status or trends of habitat and salmon populations in your watershed?

We continue to struggle with land use issues, similar to other developing areas of Puget Sound, but do not have any information on the status and trends of our salmon populations.

7. Are there new challenges associated with implementing salmon recovery actions that need additional support? If so, what are they?

There are no new challenges. Salmon recovery in our West Sound watersheds is synonymous with protection and restoration of our lowland streams and nearshore.

| May-10 | West Sound Watersheds Council | 3 Year Work Program | | | | | | | | | | | | | Project Planning | | | | Project Cost and Sponsor | | |
|--|---|---|--|--------------|---|--|----------------------------|---|--|----------------------------|---------------------|----------------------------------|---------------------|----------------------------|------------------|----------------------------|----------------|-----------------------|-----------------------------------|-------------------------------------|--|
| Project Type <small>ss indicates south sound</small> | Project Name | Project Description (brief description) | Limiting Factors | Habitat Type | Activity Type | Project Performance (restore 30 acres of floodplain) | Primary Species Benefiting | Secondary Species Benefiting | Current Project Status (| 2010 Activity to be funded | 2010 Estimated Cost | 2011 Activity to be funded | 2011 Estimated Cost | 2012 Activity to be funded | 2012 Estimated | Likely End Date | Likely Sponsor | Total Cost of Project | Local share or other funding | Source of funds (PSAR, SRFB, other) | |
| Capital | | | | | | | | | | | | | | | | | | | | | |
| Habitat Restoration | | | | | | | | | | | | | | | | | | | | | |
| | Chico Creek Instream Phase 2B (downstream - Ph 1) | restore riparian corridor | alteration of stream channel, bed,LWD removal | riparian | fish passage, instream spawning and rearing conditions | 1.5 acres, stream habitat, 16 miles passage | steelhead, chum | Chinook, coho, cutthroat | project on hold | | | | | | | | Kitsap DCD | \$480,000 | \$72,000 | PSAR | |
| | Chico Creek Instream Phase 2A (upstream of Ph 1) | Remove weirs, restore complexity | alteration of stream channel, bed,LWD removal | riparian | fish passage, instream spawning and rearing conditions | 4 acres stream habitat, 16 miles passage | steelhead, chum | Chinook, coho, cutthroat | construction on schedule for 2010 | construction | \$707,200 | construction | | | 2010 | Kitsap DCD | \$832,000 | \$124,800 | SRFB/PSAR | | |
| | Carpenter Creek Restoration Ph 1 | restore tidal function | nearshore alteration | nearshore | restore nearshore, sub-estuary function | 30 acres sub-estuary habitat | Chinook | steelhead, coho, cutthroat, chum, forage fish | shovel ready | construction | \$2,800,000 | finish construction | | | 2010 | Kitsap PW | \$2,800,000 | | legislative capital budget | | |
| | Chico Creek Golf Club Hill Rd Culvert Removal | increase fish passage | altered stream channel | riparian | fish passage, stream channel morphology | 16 miles fish passage | steelhead, chum | Chinook, coho, cutthroat | 30% Design | | | Complete Design | \$150,000 | construction | \$1,825,000 | 2013 | Kitsap PW | \$1,825,000 | \$270,000 | SRFB, PSAR, congress | |
| | Chico Estuary Driveway | restore tidal function, increase fish passage | Nearshore alteration, alteration of stream channel | nearshore | fish passage, estuarine function, stream channel morphology | 17 miles spawning habitat, 4 acres estuarine fill | steelhead, chum | Chinook, coho, cutthroat | shovel ready | finish design, permitting | | construction | \$160,000 | | 2011 | Kitsap PW, Suquamish Tribe | \$160,000 | | US Navy, EPA | | |
| | Chico Estuary Culvert Removal | restore tidal function, increase fish passage | Nearshore alteration, alteration of stream channel | nearshore | fish passage, estuarine function, stream channel morphology | 17 miles spawning habitat, 4 acres estuarine fill | steelhead, chum | Chinook, coho, cutthroat | Feasibility completed | finish design, permitting | | wait for driveway to be finished | construction | \$492,000 | 2011 | Kitsap PW, Suquamish Tribe | \$500,000 | ? | US Navy, EPA | | |
| | Chico Estuary Road Fill Removal | restore tidal function, increase fish passage | Nearshore alteration, alteration of stream channel | Nearshore | fish passage, estuarine function, stream channel morphology | 17 miles spawning habitat | steelhead, chum | Chinook, coho, cutthroat | Feasibility completed | finish design, permitting | | wait for driveway to be finished | construction | \$349,000 | 2011 | Kitsap PW, Suquamish Tribe | \$350,000 | ? | US Navy, EPA | | |
| | Chico Estuary Bulkhead Removal | restore nearshore processes | nearshore alteration | Nearshore | fish passage, estuarine function, stream channel morphology | 250 ft of shoreline | steelhead, chum | Chinook, coho, cutthroat | Feasibility completed | finish design, permitting | | construction | \$60,000 | | 2011 | Kitsap DCD | \$60,000 | | SRFB | | |
| | Chico Estuary Invasive Veg. Removal | remove invasive plants | altered riparian habitat | Nearshore | altered riparian vegetation | 39 acres shoreline, riparian areas | steelhead, chum | Chinook, coho, cutthroat | Feasibility completed | NA | | complete | \$85,000 | | 2010 | Kitsap DCD | \$85,000 | | SRFB | | |
| | Chico Estuary Kitty Hawk Dr LID Parking Lot | tippage from estuary restoration | Nearshore alteration, alteration of stream channel | Nearshore | fish passage, estuarine function, stream channel morphology | uses fill removed from restoration | steelhead, chum | Chinook, coho, cutthroat | Feasibility completed | design | | construction | \$100,000 | | 2011 | Kitsap DCD | \$100,000 | | SRFB | | |
| | Highway 3 Bridge over Chico Creek | improve fish passage, stream function | fish passage, alteration of stream channel | Nearshore | fish passage, estuarine function, stream channel morphology | 17 miles spawning habitat, 4 acres estuarine fill | steelhead, chum | Chinook, coho, cutthroat | Reach assessment completed (WSDOT CED) | design | | design | \$100,000 | design | \$100,000 | 2017 | WSDOT | \$21,000,000 | | WSDOT | |
| | Strawberry Plant Park Restoration | restore nearshore processes | altered nearshore habitat | Nearshore | restore nearshore, sub-estuary function | 2 acres salt marsh, nearshore, riparian | Chinook | chum, coho, steelhead, cutthroat, forage fish | design and permitting nearly finished | construction | \$650,000 | | | | 2010 | COBI | \$650,000 | \$375,000 | COBI, SRFB,NRDA | | |
| | Indianola Estuary restoration | restore tidal function | altered tidal flow | Nearshore | restore nearshore, sub-estuary function | 3.5 acres | Chinook | chum, coho, steelhead, cutthroat | design and permitting nearly finished | construction | \$450,000 | | | | 2010 | Kitsap PW | \$450,000 | \$450,000 | SRFB, Suquamish, Oil spill \$\$\$ | | |
| | Penrose Point Bulkhead Removal | restore nearshore processes | altered nearshore habitat | Nearshore | restore nearshore and beach processes | 1500 feet shoreline | Chinook | chum, coho, steelhead, cutthroat, forage fish | Feasibility completed | | | design, permitting | \$40,000 | construction | \$350,000 | 2012 | SPSSEG | \$500,000 | \$150,000 | WA State Parks, SRFB, PSAR,USFWS | |
| | Beaver Creek restoration Ph. 4 | restore fish passage, regulate flow | high velocity, sediment | riparian | fish passage, stream channel morphology | | chum, coho | cutthroat | design and permitting nearly finished | | | construction | \$250,000 | close out | \$50,000 | 2011 | MSFEG | \$300,000 | \$100,000 | PSAR,US Navy | |

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|----|---|--|--|------------------------|---|--|---------------|---|--|---|-----------|---------------------------|----------------|-----------------|-------------|--------------------------|--------------------------|-------------|--------------------------------------|---------------------------------|
| | Harper Estuary Restoration | restore tidal function | altered nearshore and sub-estuary | Nearshore | restore nearshore, sub-estuary function | | Chinook | chum, coho, steelhead, cutthroat | project sponsor not actively working on this | | | | | | | 2013 | MSFEG | \$1,000,000 | \$10,000 | SRFB, PSAR |
| ss | Whiteman Cove Estuary Restoration | restore tidal function | nearshore alteration | nearshore | restore nearshore, sub-estuary function | 30 acres sub-estuary habitat | Chinook | steelhead, coho, cutthroat, chum, forage fish | conceptual | meet with landowners | | propose project | design | \$50,000 | 2013 | SPSSEG | \$500,000 | \$50,000 | SRFB, PSAR, ESRP | |
| | Donkey Creek Restoration | restore tidal function, improve fish passage | altered tidal flow, stream channel | Nearshore | fish passage, estuarine function, stream channel morphology | 1 acre, .3 mile shoreline, 300 ft. 18 in culvert | chum, coho | Chinook, cutthroat, steelhead | City of Gig Harbor received congressional appropriations | design | \$800,000 | construction | \$3,600,000 | close out | \$50,000 | 2011 | City of GH | \$4,450,000 | \$800,000 | PSAR, Fed. Approp |
| | Blakely Harbor Park Shoreline Restoration | restore nearshore processes & habitat | altered nearshore habitat | Nearshore | restore nearshore, sub-estuary function | | Chinook | chum, coho, steelhead, cutthroat, forage fish | project not active at this time | | | | | | | | COBI | \$2,151,000 | \$1,750,000 | SRFB, NRDA, ESRP |
| | Pritchard Park West Rip-Rap Shoreline Restoration | restore nearshore processes & habitat | altered nearshore habitat | Nearshore | restore nearshore function | 538 ft shoreline, 1.3 acres intertidal, .65 acres riparian | Chinook | chum, coho, steelhead, cutthroat, forage fish | design underway | finish design & possibly construction | \$880,000 | | | | | 2011 | COBI | \$880,000 | \$400,000 | SRFB, NRDA |
| | Pritchard Park East Bluff Shoreline Restoration | restore nearshore processes & habitat | altered nearshore habitat | Nearshore | restore nearshore function | 475 ft shoreline, .1 acre intertidal, .4 acres riparian | Chinook | chum, coho, steelhead, cutthroat, forage fish | design underway | finish design, construct driveway phase | \$360,000 | construct beach phase | \$755,000 | | | 2011 | COBI | \$1,115,000 | \$410,000 | SRFB, NRDA, COBI |
| | Powel Shoreline Restoration | restore nearshore processes | altered nearshore habitat | Nearshore | restore nearshore, sub-estuary function | 1800 ft shoreline | Chinook | chum, coho, steelhead, cutthroat | planning and design underway | design | \$127,000 | finish design, permitting | \$25,000 | construction | \$1,000,000 | 2015 | BILT, COBI, Powel Family | \$1,200,000 | \$100,000 | SRFB, PSAR, ESRP |
| ss | Maple Hollow Shoreline Restoration | restore nearshore processes | altered nearshore habitat | Nearshore | restore nearshore function | 2 acres, 1450 ft. shoreline | Chinook | chum, coho, steelhead, cutthroat, forage fish | conceptual | A & E | \$50,000 | Permits | \$50,000 | construction | \$500,000 | 2012 | Key Pen Parks | \$600,000 | local match | PSAR, ALEA |
| | Milwaukee Dock Eelgrass Restoration | restore eelgrass habitat | altered nearshore habitat | Nearshore | restore eelgrass beds | 5 acres eelgrass meadow | Chinook | chum, coho, steelhead, cutthroat, forage fish | shovel ready | | | 704000 | construction | | | 2010 | NOAA, COBI | \$1,512,000 | \$808,000 | SRFB, PSAR, NRDA, ESRP |
| | Bainbridge Island Waterfront Park | restore nearshore processes & habitat | altered nearshore habitat | Nearshore | restore nearshore function | 625 ft shoreline | Chinook | chum, coho, steelhead, cutthroat, forage fish | project not active at this time | | | | | | | | COBI | \$550,000 | \$50,000 | SRFB, COBI |
| | Blake Island East Beach Restoration | restore nearshore processes | altered nearshore habitat | Nearshore | restore nearshore and beach processes | 1000 ft shoreline | Chinook | chum, coho, steelhead, cutthroat, forage fish | conceptual | feasibility | | | | | | | WDFW, WA State Parks | \$200,000 | \$50,000 | SRFB |
| | Clear Creek Bridge | restore nearshore processes | altered nearshore habitat | Nearshore | restore nearshore, sub-estuary function | | Chinook | chum, coho, steelhead, cutthroat | on county TIP | | | | design, permit | \$25,000 | 2013 | Kitsap PW | \$2,825,000 | \$2,800,000 | Kitsap PW | |
| | Keyport Lagoon Restoration | restore nearshore processes | altered nearshore habitat | Nearshore, sub-estuary | restore nearshore, sub-estuary function | | Chinook | chum, coho, steelhead, cutthroat, forage fish | design underway, adaptive management plan | feasibility & design | | | | | 2013 | US Navy, Suquamish Tribe | | | US Navy | |
| | Pt no Pt Estuary Restoration | restore nearshore processes | altered nearshore habitat | Nearshore, sub-estuary | restore nearshore, sub-estuary function | | Chinook | chum, coho, steelhead, cutthroat, forage fish | conceptual | planning | | | | | | | WDFW, Kitsap Parks | | | ESRP |
| ss | Large Wood (LW) Program | procure, store & coordinate LW for restoration | loss of large wood material in riparian & shoreline habitats | riparian, nearshore | structural function of streams and shorelines | | all salmonids | | conceptual | planning | | implement program | \$100,000 | on-going | \$50,000 | 2020 | RFEG/ County/ State | \$150,000 | match could come from local partners | PSAR, PSP |
| | Skunk Bay Wetland | restore nearshore processes | altered nearshore and sub-estuary | nearshore | restore nearshore, sub-estuary function | | Chinook | chum, coho, steelhead, cutthroat, forage fish | conceptual | planning | | | | | | | WDFW | | | ESRP, PSAR |
| | Crescent Creek culvert replacement | restore nearshore processes | altered nearshore habitat | Nearshore | restore nearshore, sub-estuary function | | Chinook | chum, coho, steelhead, cutthroat | conceptual | planning | | design | \$100,000 | permitting | \$50,000 | 2014 | SPSSEG | | | City of Gig Harbor, SRFB, PSAR |
| | Anna Smith park shoreline restoration | restore nearshore processes | altered nearshore habitat | Nearshore | restore nearshore, sub-estuary function | 700 ft shoreline | Chinook | chum, coho, steelhead, cutthroat | planning and design underway | design | \$25,000 | finish design, permitting | \$10,000 | remove bulkhead | \$65,000 | 2012 | Kitsap County Parks | \$100,000 | | Kitsap County Parks, ESRP, PSAR |
| ss | Filucy Bay bulkhead removals | restore nearshore processes | altered nearshore habitat | Nearshore | restore nearshore, sub-estuary function | 5000 ft shoreline | Chinook | chum, coho, steelhead, cutthroat | Conceptual | Design | 30,000 | Construction | 150,000 | | 2013 | South Puget Sound SEG | \$180,000 | ESRP | SRFB, PSAR | |

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|------------------------------------|---|--|--|-------------------------|--|---|-----------------|---|--|----------------------|-------------|-----------------------|-------------|---|-------------|-------------------------------------|---------------------------------------|--------------|--------------------|-----------------------------|
| | Von Geldern Cove bulkhead removals | restore nearshore processes | altered nearshore habitat | Nearshore | restore nearshore, sub-estuary function | 1500 ft of shoreline | Chinook | chum, coho, steelhead, cutthroat | Conceptual | Design | 30,000 | Construction | 150,000 | | 2014 | South Puget Sound SEG | \$180,000 | ESRP | SRFB, PSAR | |
| | East Oro Bay dam removal | restore nearshore processes | altered nearshore habitat | nearshore | restore nearshore, salt marsh function | | Chinook | chum, coho, steelhead, cutthroat | conceptual | | | | | | | South Puget Sound SEG | | ESRP | SRFB, PSAR | |
| | Rain Garden Program | LID implementation | storm water | water quality, quantity | rain garden installations | NA | all salmonids | | Currently funded | build gardens | \$100,000 | build gardens | \$100,000 | build gardens | \$100,000 | 2020 | Kitsap Cons. District, SSWM | \$300,000 | \$300,000 | Kitsap Cons. District, SSWM |
| | Kitsap Fairgrounds LID | LID implementation | storm water | water quality, quantity | storm water retrofit | NA | all salmonids | | planning, design | construction | \$45,000 | construction | \$178,000 | construction | \$167,000 | 2012 | Kitsap Parks, Cons. District | \$390,000 | \$25,000 | DOE, CCWF |
| | Regional Shoreline Restoration | remove shoreline armoring | altered nearshore habitat | nearshore | restore nearshore function | unknown | Chinook | chum, coho, steelhead, cutthroat | underway | identify properties | | | | | 2012 | Kitsap County DCD | \$700,000 | \$230,000 | EPA | |
| | Carpenter Creek Restoration Ph 2 | restore tidal function | nearshore alteration | nearshore | restore nearshore, sub-estuary function | 30 acres sub-estuary habitat | Chinook | steelhead, coho, cutthroat, chum, forage fish | design complete (USACOE) | | | secure local match | \$245,000 | | 2013 | Kitsap County DCD | \$1,300,000 | \$245,000 | PSAR, ESRP, PSNERP | |
| | Net shed acquisition | protect ecologically intact shoreline | nearshore habitat protection | Nearshore | protects intact shoreline | 600 ft. shoreline | Chinook | chum, coho, steelhead, cutthroat, forage fish | Conceptual | planning | | | | acquisition | 1100000 | 2012 | City of Poulsbo | 1,100,000 | 300000 | PSAR, ESRP |
| Acquisition for Restoration | | | | | | | | | | | | | | | | | | | | |
| | Chico Estuary Acquisitions | improve fish passage, stream function | fish passage, alteration of stream channel | Nearshore | fish passage, estuarine function, stream channel | 17 miles spawning habitat, 4 acres estuarine fill | steelhead, chum | Chinook, coho, cutthroat | Feasibility completed | complete acquisition | \$230,000 | | | | 2011 | Kitsap DCD | \$230,000 | \$35,000 | ESRP | |
| | Poulsbo's Fish Park Acquisition & Restoration | continue protection of Dogfish Creek estuary | fish passage, altered nearshore habitat | nearshore | fish passage, estuarine function, stream channel | 2000 ft. shoreline | steelhead, chum | Chinook, coho, cutthroat | on City's planning documents | planning | | acquisition | 300,000 | land acquisition | 300000 | 2014 | City of Poulsbo | 700,000 | 250000 | SRFB, ESRP, PSAR |
| | No. Liberty Bay shoreline protection | protect ecologically intact shoreline | nearshore habitat protection | Nearshore | protects intact shoreline | 400 ft. shoreline | Chinook | chum, coho, steelhead, cutthroat, forage fish | Conceptual | planning | | acquisition | 300,000 | restoration | 50000 | 2012 | City of Poulsbo | 350,000 | 100000 | Suquamish Tribe, PSAR, ESRP |
| | West Poulsbo shoreline protection | protect ecologically intact shoreline | nearshore habitat protection | Nearshore | protects intact shoreline | 500 ft. shoreline | Chinook | chum, coho, steelhead, cutthroat, forage fish | Conceptual | planning | | planning | | acquisition, restoration | 1000000 | 2012 | City of Poulsbo | 1,000,000 | 250000 | Suquamish Tribe, PSAR, ESRP |
| Acquisition for Protection | | | | | | | | | | | | | | | | | | | | |
| | Dutcher Cove | protect intact barrier beach and lagoon | nearshore habitat protection | nearshore | protect intact barrier beach and lagoon | 4 acres protected | Chinook | chum, coho, steelhead, cutthroat, forage fish | project not currently active, landowner changed mind | | | | | | | | Key Pen Parks, TPL | | | |
| | Murden Cove - Trick Property | protect ecologically intact shoreline | nearshore habitat protection | nearshore | protect intact shoreline and wetlands | 41 acres 7325 ft shoreline | Chinook | chum, coho, steelhead, cutthroat, forage fish | negotiations underway w/ landowners | secure purchase | \$500,000 | site restoration | \$100,000 | continue protection of remaining properties | \$100,000 | 2015 | BILT, COBI | \$1,360,300 | \$205,000 | SRFB, ESRP, PSAR |
| | ss Coulter Creek | protect ecologically intact shoreline | nearshore habitat protection | nearshore | protect intact shoreline and tidelands | 28 acres tideland | Chinook | chum, coho, steelhead, cutthroat, forage fish | negotiations underway w/ landowner | secure purchase | | complete purchase | \$300,000 | | 2015 | CLC | \$1,000,000 | \$700,000 | PSAR, SRFB, CELP | |
| | ss Devils Head | protect ecologically intact shoreline | nearshore habitat protection | nearshore | protect intact shoreline | 1 mile, 94 acres | Chinook | chum, coho, steelhead, cutthroat, forage fish | negotiations underway w/ landowner | secure purchase | | complete purchase | \$500,000 | | 2015 | CLC, Pierce Co Parks, Key Pen Parks | \$3,375,000 | \$1,687,500 | WWRP, other LE's | |
| | ss Ketron Island shoreline protection | protect ecologically intact shoreline | nearshore habitat protection | nearshore | protect intact shoreline | unknown | Chinook | chum, coho, steelhead, cutthroat, forage fish | Conceptual | Scoping | 10,000 | acquisition | 300,000 | acquisition | 300000 | 2014 | Nisqually Land Trust, Nisqually Tribe | \$2,500,000 | | PSAR, ESRP |
| | Southworth Point protection | protect ecologically intact shoreline | nearshore habitat protection | nearshore | protect intact shoreline | unknown | Chinook | chum, coho, steelhead, cutthroat, forage fish | Conceptual | Scoping | 10,000 | conservation easement | 300,000 | | 2012 | Great Peninsula Conservancy | \$310,000 | | PSAR, ESRP | |
| | West Bainbridge shoreline acquisition | protect ecologically intact shoreline | nearshore habitat protection | nearshore | protect intact shoreline | unknown | Chinook | chum, coho, steelhead, cutthroat, forage fish | Conceptual | Scoping | 10,000 | conservation easement | 300,000 | | 2012 | Bainbridge Is Land Trust | \$310,000 | | PSAR, ESRP | |
| Total Capital Need | | | | | | | | | | | \$7,784,200 | | \$7,908,000 | | \$7,773,000 | | \$59,490,300 | \$13,097,300 | | |
| Non-Capital Programs | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|--|--|--|-----------|---------------------|--------------------------|--------|---------------|---|--------------------------------------|----------------------|-----------|--------------------------|-----------|-------------------|-----------|---------|---|-------------|-----------|---|
| Harvest Mngment Support | | | | | | | | | | | | | | | | | | | | |
| | Fish Data Monitoring | process spawning survey, harvest data | NA | NA | NA | NA | all salmonids | | conceptual | | | project set-up with RITT | \$25,000 | on-going | \$25,000 | 2057 | Squamish Tribe | \$75,000 | | PSAR |
| | Sinclair Inlet Sport Harvest Monitoring | monitor sport catch, cwt recovery | NA | NA | NA | NA | all salmonids | | conceptual | | | project set-up with RITT | \$25,000 | on-going | \$25,000 | 2057 | Squamish Tribe | \$75,000 | | PSAR |
| Future Habitat Project Develop | | | | | | | | | | | | | | | | | | | | |
| | WRIA 15 water Typing | update fish and LFA for streams | NA | NA | NA | NA | all salmonids | | on going | North Kitsap streams | \$140,000 | expand assessment | \$100,000 | on-going | \$100,000 | 2015 | Wild Fish Conservancy | \$340,000 | | PSAR |
| | Kitsap County Nearshore Assessment Model Utilization | modify NSA model = planners applicability | NA | NA | NA | NA | all salmonids | | complete, being used for SMP updates | | | | | | | | Kitsap DCD | | | PSAR |
| | Kitsap NS Alternative Futures | use NS Assess for shoreline protection | NA | NA | NA | NA | all salmonids | | funded | | | | | | | 2012 | Kitsap DCD | \$587,000 | \$177,000 | EPA |
| | South Sound Nearshore Prioritization | use SSHIAAP for proj. selection | NA | NA | NA | NA | all salmonids | | completed in WRIA 13, 14 | | | | | | | | Squaxin Island Tribe | \$20,000 | \$5,000 | PSAR |
| | Bainbridge Is. Shore Proq- Proj Dev | works with NS project team, above | NA | NA | NA | NA | all salmonids | | project on hold | | | | | | | | COBI | \$75,000 | | SRFB, PSAR |
| Habitat Protection | | | | | | | | | | | | | | | | | | | | |
| | County/City SMP updates | complete adopted SMPs | NA | NA | NA | NA | all salmonids | | bequn in 2009 | scoping | varies | plan updates | varies | finish and adopt | varies | 2012 | Kitsap Co., all cities | varies | varies | DOE |
| | WRIA 15 water Typing | SEE ABOVE | | | | | | | | | | | | | | | | | | |
| | Marine Riparian Conservation Easements | Protect nearshore processes & habitat | Nearshore | riparian, nearshore | protect intact shoreline | 1 mile | Chinook | chum, coho, steelhead, cutthroat, forage fish | Pilot underway | complete pilot | \$5,000 | expand program | \$50,000 | expand program | \$50,000 | 2012 | BILT, COBI, GPC, Kitsap Co. | \$175,000 | | SRFB, PSAR |
| W'shed Plan Implement.& Coordinate. | | | | | | | | | | | | | | | | | | | | |
| | West Sound Watershed organization | staff salmon recovery implementation. | NA | NA | NA | NA | all salmonids | | currently funded | staff Lead Entity | \$115,000 | staff Lead entity | \$115,000 | staff Lead Entity | \$115,000 | 2020 | Kitsap DCD | \$345,000 | | RCO, PSAR |
| | Chico Estuary & Mainstem Public Use Plan | develop plans & agreement for use | NA | NA | NA | NA | all salmonids | | NA | complete | \$160,000 | | | | | | Kitsap DCD | \$160,000 | | ESRP |
| Outreach & Education | | | | | | | | | | | | | | | | | | | | |
| | Marine education in the schools | Classroom education =promotion of marine stewardship | NA | NA | NA | NA | all salmonids | | Currently available | | \$25,000 | | \$30,000 | | \$50,000 | Ongoing | Pierce CD, Kitsap SSWM, UW/WSU, 105000 (Pierce CD) | | | Private donations, additional grant funding |
| | Shoreline stewardship | Beach programs =stewardship | NA | NA | NA | NA | all salmonids | | On going | | \$65,000 | | \$70,000 | | \$70,000 | Ongoing | Pierce CD, Kitsap SSWM, UW/WSU, COBI, 175000 (Pierce CD) 30000 COBI | | | Private donations, additional grant funding |
| | Realtor Workshops | training, tools =to real estate professionals | NA | NA | NA | NA | all salmonids | | Available | | \$8,000 | | \$8,000 | | \$8,000 | Ongoing | Pierce, Kitsap Cons. Districts | \$30,000 | \$30,000 | Pierce, Kitsap Cons. Districts |
| | Natural Yard Care | Provide education & activities | NA | NA | NA | NA | all salmonids | | Currently available | | \$75,000 | | \$75,000 | | \$75,000 | Ongoing | TPCHD | \$225,000 | | TPCHD, PC Solid water |
| Instream Flow Protection | | | | | | | | | | | | | | | | | | | | |
| | WRIA 15 water Typing | SEE ABOVE | NA | NA | NA | NA | all salmonids | | | | | | | | | | | | | |
| Habitat Project Monitoring | | | | | | | | | | | | | | | | | | | | |
| | Nearshore project effectiveness | project effectiveness monitoring | NA | NA | NA | NA | all salmonids | | conceptual | develop | | implement | \$40,000 | on-going | \$40,000 | 2017 | SPSSEG, Kitsap DCD | \$80,000 | | PSAR, ESRP |
| Total Non-Capital Need: | | | | | | | | | | | \$593,000 | | \$538,000 | | \$558,000 | | | \$2,187,000 | \$212,000 | |

| Priority Projects and Programs | Benefiting Non-Listed Species | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|--------------------------------------|--|---|-----------------------------------|---|----------------------------|-----------------|-------------------------------|-----------------------|------------------|-----------|---------------------------------|-------------|-----------------------|-------------|------|----------------------------------|--------------|-------------|-----------------------------------|
| ss | Little Minter Fish Passage | replace culvert w/ bridge | fish passage, stream morphology | riparian | fish passage | 2 mile spawning habitat | coho, chum | Chinook, steelhead, cutthroat | partially designed | design, permit | \$20,000 | construction | \$160,000 | close out | \$10,000 | 2011 | SPSSEG | \$190,000 | \$28,500 | PSAR/SRFB |
| | Kitsap Lake outlet modification | replace structure for fish passage | fish passage, instream flow regulation | riparian, instream | fish passage | | coho, chum | Chinook, steelhead, cutthroat | conceptual | develop | | design | \$20,000 | permit, construct? | \$50,000 | 2011 | WDFW | \$70,000 | \$20,000 | PSAR, CSF |
| | Chico Wild gamete collection | protect Chico Creek Chum | NA | NA | NA | NA | chum | | project started | collect, process | \$15,000 | collect, process | \$15,000 | collect, process | \$15,000 | 2015 | Suquamish Tribe | \$45,000 | \$45,000 | NWIFC |
| ss | Small blocking culvert remediation | identify, correct | fish passage | riparian | fish passage | X miles of habitat | steelhead | chum, coho, cutthroat | conceptual | develop | | identify, use water typing info | \$200,000 | construct | \$500,000 | 2019 | Suquamish Tribe, local partners | \$2,000,000 | \$500,000 | PSAR, SRFB, DOE |
| | Gilberton Creek Restoration | acquire easements, restore watershed | lowland stream & shore restoration | riparian, sub-estuary restoration | instream flow shoreline restoration | 5 acres, .25 mile stream | chum | coho, steelhead, cutthroat | feasibility underway | planning | \$50,000 | design | \$100,000 | permit, construct? | \$500,000 | 2015 | GPC, MSFEG | \$1,000,000 | \$250,000 | ESRP, SRFB, PSAR |
| ss | Ray Nash Creek Restoration | resize 3 culverts, remove invasives | fish passage, invasives, riparian cover | riparian | fish passage, riparian planting | 2000 ft stream | coho, chum | cutthroat | conceptual | planning | | design | \$20,000 | permit, construct? | \$50,000 | 2011 | Pierce CD, SPSSEG | \$70,000 | \$10,000 | FFFP, CSF |
| | Johnson Creek Watershed | Acquisition for protection | wetlands, stream, mature forest, corridor | riparian | ecosystem /habitat protection | ?? Acres | steelhead | chum, cutthroat, coho | conceptual | planning | | planning /land acquisition | \$500,000 | land acquisition | \$1,000,000 | 2015 | project is not active | \$2,500,000 | local match | PSAR, SRFB |
| | South Fork Dogfish Creek Restoration | restore fish passage and water quality | water quality fish passage | riparian | fish passage, stormwater | 1.5 miles | coho, chum | cutthroat | in progress | design, permit | \$50,000 | construction | \$250,000 | close out | \$50,000 | 2012 | City of Poulsbo, Suquamish Tribe | \$350,000 | \$150,000 | PSAR, SRFB |
| ss | Warren Creek Fish Passage | restore fish passage | fish passage | riparian | fish passage | .5 mile | coho | cutthroat, chum | conceptual | planning | | design | \$25,000 | construct | \$950,000 | 2012 | SPSSEG, Pierce Co. | \$500,000 | \$483,000 | Pierce County,SRFB, PSAR |
| ss | Goodnough Ck.culvert replacements | restore fish passage and habitat at mouth | fish passage, nearshore functions | riparian | fish passage | .5 mile | coho | cutthroat, chum | conceptual | planning | | design | \$25,000 | construct | | | | \$580,000 | \$100,000 | Pierce Co. |
| | Illahee Creek Restoration | restore ecological processes to Illahee Ck. | fish passage, water quality | riparian | acquisition, stormwater retrofitting | | coho | cutthroat, chum,steelhead | in progress | planning | \$10,000 | begin acquisitions | \$50,000 | continue acquisitions | \$1,000,000 | 2020 | Port of Illahee | \$7,000,000 | \$500,000 | Kitsap Co Parks, DOE, NFWF, CPF |
| | Clear Creek floodplain restoration | restore floodplain to lower Clear Creek | channelized stream, lack of vegetation | riparian | restore floodplain functions | 5 acres, .25 mile stream | coho | cutthroat, chum,steelhead | conceptual | planning | \$25,000 | permitting | \$25,000 | construction | \$150,000 | 2012 | Kitsap SSWM | \$200,000 | \$200,000 | Kitsap Co. SSWM |
| | Ruby Creek culvert removals | increase fish passage | fish passage | riparian | fish passage, stream channel morphology | 1.7 miles spawning habitat | coho | cutthroat, historic steelhead | feasibility completed | design, permit | \$6,000 | construction | \$34,000 | | | 2011 | Kitsap Cons. District | \$40,000 | \$60,000 | Kitsap Conservation District,FFFP |
| | Dickerson Ck ladder | increase fish passage | altered stream channel, fish passage | riparian | fish passage, stream channel morphology | .5 miles spawning habitat | steelhead, chum | cutthroat, coho | design complete | | | implementation | \$100,000 | construction | \$100,000 | 2012 | Kitsap Cons. District | \$200,000 | \$25,000 | Kitsap Conservation District, ? |
| | Bjorgen Ck Fish passage | fish passage restoration upstream from WSDOT project | fish passage | riparian | fish passage | .35 mile | coho | chum | conceptual | planning | | design | \$50,000 | construction | \$350,000 | 2012 | City of Poulsbo | \$400,000 | \$100,000 | |
| Total Non-Listed Species Need: | | | | | | | | | | | \$135,000 | | \$1,365,000 | | \$3,125,000 | | | \$14,305,000 | \$2,086,500 | |

East Kitsap WRIA 15 Salmon Recovery Planning Implementation and Habitat Analysis Matrix

The planning area for the East Kitsap Water Resource Inventory Area (WRIA) 15 and the E. Kitsap WRIA 15 Lead Entity includes the streams on the east side of the Kitsap, Key, and Gig Harbor peninsulas, and Bainbridge, Anderson, McNeil and Fox islands that drain toward Puget Sound, together with their watersheds, the nearshore and marine waters. The planning area has about 270 miles of shoreline that includes many inlets with quiet, shallow waters which are ideal foraging and rearing habitat for juvenile salmon. Juvenile salmonids are present along the shoreline in high numbers from March through July and in lower numbers throughout the year. Nearshore waters of East Kitsap support Chinook, coho, chum and pink salmon, cutthroat trout, and some steelhead trout. The numerous small streams in the East Kitsap region primarily support chum and coho salmon, steelhead and cutthroat trout. Chinook spawning, incubation and rearing have been identified in some of the larger streams. The streams do not support the standard Chinook conditions, for they are groundwater- and rainwater-supported with no high-altitude supportive snowpack, and consequently are both warmer and with lower flows than standard habitats. There are no genetic stock identification data for naturally spawning Chinook in this area.

Salmon recovery planning in the East Kitsap planning area is an *integral part of the larger regional salmon recovery effort*, and has been developed with the recognition that the nearshore and marine areas play an important role in providing support for Chinook salmon from the South/Central Puget Sound region. To protect and restore the nearshore and marine areas, the City of Bainbridge Island and Kitsap County have each developed recovery plans for their subareas with slightly different approaches, based in part on the different states of completion of environmental assessments.

The combination of programs and programmatic actions that is described in this E. Kitsap WRIA 15 chapter in the *Puget Sound Salmon Recovery Plan* represents a comprehensive effort to conserve and restore salmon habitat using a **multi-species, ecosystem approach** (see sections 5.0 and 6.1, *above*). The E. Kitsap WRIA 15 Lead Entity's ***Salmon Habitat Restoration Strategy*** (see Appendix G) is an important component in the implementation of the E. Kitsap recovery planning effort, and serves the purposes of identifying and characterizing potential salmonid conservation and restoration areas, and setting forth the criteria for salmon recovery project selection. The *Strategy* is periodically updated by the Lead Entity, and is intended to be fully integrated with and supportive of the salmon recovery planning in this chapter.

The **goal** of the E. Kitsap WRIA 15 salmon recovery planning and of the Lead Entity's *Salmon Habitat Restoration Strategy* is to restore healthy self-sustaining wild populations of the salmon species that are native to the streams and shorelines of the Kitsap Peninsula. Four **objectives** to accomplish this goal are:

- Increase population levels,
- Maintain geographically diverse populations,
- Promote the preservation and restoration of healthy, functioning ecosystems, and
- Increase public understanding and support for salmon recovery.

Kitsap County and the City of Bainbridge Island have developed **conceptual models** for habitat restoration and ecosystem-based salmon recovery (*see* Figures 6.1 and 7.3). These models illustrate the interaction of existing information sources and programs with the ecological factors that drive salmon habitat conservation and restoration in E. Kitsap WRIA 15 planning area.

The **hypotheses** that serve as a basis for the East Kitsap portion of the Salmon Recovery Plan are:

Habitat Hypothesis

East Kitsap streams and refugia, and nearshore habitats are important to a variety of populations of Puget Sound Chinook salmon, other salmonids, and other fish species (“multi-species use”). Land use and direct modification of salmon habitats has altered habitat-forming processes (*e.g.*, hydrology in freshwater systems) and structure (especially through filling and armoring in the nearshore) that has reduced the ability of these habitats to support salmonids and other species, especially juveniles.

Hypothesis regarding the Viable Salmon Population (VSP) parameters that most limit salmon recovery

The VSP functions that are provided to individual salmon—spatial structure and diversity—are the parameters that most limit salmon recovery in the East Kitsap planning area.

Data from the Bainbridge Island nearshore assessment and from the Kitsap Refugia Report and other sources document many changes from historic shoreline profiles—often human-caused—as well as anthropogenic modifications to shoreline and stream margins, and modification to wetted and upland areas. There are few data on the historical abundance or use of the streams or nearshore of East Kitsap by Chinook salmon; for that matter, there are still relatively limited understanding or data regarding the use and VSP parameters of the nearshore areas in other parts of Puget Sound.

Kitsap County has prepared a **Habitat Analysis Matrix** (*see* Table 6.1, *below*) to describe the principal nearshore species or critical habitat types (including a description and the functions that are provided to salmon), potential threats and stressors to those habitats, the protective measures that are currently implemented by Kitsap County, gaps in scientific knowledge or regulatory authority, measures that are planned to address the threats and gaps, and possible actions that may be undertaken if necessary resources are available. The City of Bainbridge Island provides for near-term, mid-term and long-term evaluations of progress in protecting and restoring habitat functions and values. The City’s monitoring efforts link processes to the nearshore habitat structure, integrate a multitude of nearshore habitats that support a variety of functions, establish relationships between structure and function, and link local processes to the broader Puget Sound ecosystem.

Based on the East Kitsap nearshore assessment, subsequent data from monitoring in E. Kitsap and Bainbridge Island, and data and analyses produced here and elsewhere, the above hypotheses may be modified, augmented, or replaced. Monitoring and other information may bring a better understanding of the particular nearshore functions that are most critical to salmon use. The contribution of various elements (such as pocket estuaries) may be re-evaluated.

Key Strategies and Actions that Support the Overall Approach to Salmon Recovery

Assessments

Completed—Kitsap County has completed a salmonid refugia study, and the City of Bainbridge Island (COBI) has completed a marine nearshore assessment. The Washington Dept. of Fish and Wildlife has completed an upland wildlife habitat assessment for Kitsap County (important to land use effects analysis).

In Process—Kitsap County will begin a marine nearshore assessment during 2005, which will result in an inventory and characterization of nearshore functions and attributes. COBI will conduct a subwatershed assessment that will inventory and characterize habitat, fish passage, hydrology, and land use. Both studies will identify actions in these areas to achieve their goals.

Protection and Restoration

Protecting and restoring marine nearshore areas is considered a priority based on benefits to all salmon stocks using these waters. High-priority freshwater activities in the Lead Entity and County and on Bainbridge Island include land acquisition and projects addressing fish passage restrictions in streams that provide important salmon refugia, productive capacity, and habitat.

Regulatory Tools

Local Tools

- Comprehensive Plan compliance review
- Shoreline Master Programs review and revision
- Critical Areas Ordinance review and revision
- Compliance with NPDES Phase II requirements
- State Environmental Policy Act (SEPA) review

State Tools

- WA Hydraulics Code and Hydraulics Project Approval
- WA Priority Species and Habitats
- Shoreline Master Programs review and revision
- Growth Management Act and Best Available Science rules

Federal Tools

- Clean Water Act Section 404 (and sometimes Rivers and Harbors Act Section 10) permit
- Clean Water Act Section 401 water quality certification
- Endangered Species Act and biological assessments (including Magnusson–Stevens Act Essential Fish Habitat evaluation)
- Coastal Zone Management Act certification

Harvest and Hatchery Management

Salmon harvest is conducted by the co-managers (the Suquamish Tribe and Wash. Dept. of Fish and Wildlife) under the guidance of the *Harvest Management Plan for Puget Sound Chinook* (part of the *Comprehensive Chinook Management Plan* to guide recovery of Chinook in Puget Sound). Hatchery operations (State and Tribal) are governed by resource management plans (which include hatchery genetic management plans, the State/Tribal Fish

Health Policy, and other elements. Both Hatchery and Harvest elements are presently covered by a Section 4(d) exemption issued by NOAA-Fisheries.

Adaptive Management

Kitsap County is currently developing an adaptive management and monitoring and plan. Inventory and analysis techniques first applied to Bainbridge Island will be applied beginning in late 2005 through 2007 to the East Kitsap shoreline as a basis for a “change” evaluation.

The City of Bainbridge Island provides for near-term, mid-term and long-term evaluations of progress in protecting and restoring habitat functions and values.

Kitsap County and the City of Bainbridge Island will acquire new local data for the nearshore based on the (hypothetical) links in the conceptual models (*see* Sections 6.1 and 7.3) and the hypotheses of multiple population use.

Kitsap County and the City of Bainbridge Island will work with the conceptual models and apply data and understanding that are developed locally and regionally to better link the changes in habitat volume and structure to VSP attributes in the nearshore and tributaries.

Protection is the primary salmon recovery strategy for the nearshore and marine environments. Salmon recovery planning relies on a suite of tools that includes regulatory programs, enforcement, incentives, and education to provide effective protection.

Table 6.1. East Kitsap WRIA 15 Habitat Analysis Matrix

| Species or Critical Habitat Type (Description and Functions provided to salmon) | Potential Threats & Stressors | Protective Measures Implemented by Kitsap County | Science & Regulatory Gaps | Measures Planned to Address Threats/Gaps & How | Possible Actions if Funding were Available |
|--|--|---|---|---|--|
| <p style="text-align: center; transform: rotate(-90deg); transform-origin: left top; white-space: nowrap;">Pacific Herring (<i>Clupea harengus</i>) Habitat</p> <ul style="list-style-type: none"> General: Herring deposit eggs on intertidal and shallow subtidal eelgrass and marine algae. Eggs may be deposited anywhere between the upper limits of high tide to a depth of -40 feet MLLW, but most takes place between 0 & -10 feet MLLW (Wash. Dept. of Fish and Wildlife (WDFW) 2002a). Spawning in Kitsap: Spawning is well documented in several locations such as Agate Pass / Port Madison stock; Dyes Inlet stock; Port Gamble stock; and some smaller areas. Most of the spawning in Kitsap is subtidal. (See Map 1). Herring spawning habitat is well documented in Kitsap County (D. Small, WDFW, <i>personal communication</i>, 2005). Function to salmon: Herring represent a considerable percentage of the diet for coho and Chinook salmon (58%) (Nightingale and Simenstad 2001b). <p>Healthy forage fish populations support the following Viable Salmon Population (VSP) parameters:</p> <ol style="list-style-type: none"> Abundance: Supported directly as food source. Population growth rate: Supported directly as food source. Spatial structure: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. Diversity: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. | <ul style="list-style-type: none"> Construction of overwater structures (floating docks, fixed piers, marinas, mooring buoys) can directly impact eelgrass and marine algae used for herring spawning by shading or by physical scouring. Kitsap Focus: Between 1999 and 2004 there have been 70 shoreline permits (Substantial Development & Conditional Use permits) submitted: approximately 85% of these include over-the-water structures. In addition, 132 shoreline permit exemptions have been issued: of these, only 25% would be for over-the-water structures on salt water (R. Beam, Kitsap County Shoreline Administrator, 2005). Vessels commonly associated with many overwater structures can cause prop scouring of sediment and submerged vegetation. Kitsap Focus: The extent of scouring has not been documented either for moorage facilities or private docks, piers or buoys. Water quality impacts are another potential issue associated with overwater structures. Toxic substances associated with the maintenance and operation of marine vessels may also affect herring spawn viability. Kitsap Focus: Port Madison Bay is one of three various locations in Puget Sound where mass mortality of herring spawn has been documented but more research is needed to determine the cause (Jim West, WDFW, <i>personal communication</i>, 2002). Unregulated mooring buoys can scour and shade marine vegetation. Kitsap Focus: The number of buoys that are showing up locally exceeds the number of permit applications; once placed, it is difficult to find the owners of a buoy (Small, WDFW <i>personal communication</i>). Observations are qualitative and the extent has not been documented. | <p>Federal: Army Corps of Engineers permits under Section 404 of the Clean Water Act & Section 10 of the Rivers and Harbors Act initiate Endangered Species Act (ESA) Section 7 consultations & Magnusson-Stevens Act Essential Fish Habitat (EFH) consultations. The Corps’s responsibility includes development activities below the mean, higher-high water mark.</p> <p>State: All documented forage fish spawning sites in Washington are considered “salt water habitats of special concern” and have been given “no net loss” protection in the application of Washington Administrative Code (WAC) “Hydraulic Code Rules,” WAC 220–110. Jurisdiction stops at ordinary high-water line. Direct effects are much easier to address than indirect effects.</p> <p>Kitsap County: The County’s Shoreline Management Master Program (SMP) is the primary regulatory tool. County staff rely extensively on WDFW biologists to provide habitat expertise to avoid impacting eelgrass or forage fish spawning habitat. It is difficult to deny construction of docks and piers as a feature of single family homes due to existing policies and development standards in SMP—possession of an Hydraulic Project Approval (HPA) from the State diminishes local ability to restrict development based on environmental considerations (R. Beam, <i>personal communication</i> 2005).</p> <p>The Kitsap County Public Works Department has adopted the ESA Section 4(d)-compliant regional road maintenance guidelines and will continue to operate according to those principles.</p> | <p>Science Gaps:</p> <ul style="list-style-type: none"> Current knowledge and understanding of the cumulative effects of overwater structures on spawning habitat are limited. Methods for the measurement of cumulative effects have not been developed. There are uncertainties regarding algal population dynamics (<i>e.g.</i> <i>Ulva</i> blooms, <i>Sargassum muticum</i> introduction, attached vs. unattached algae contribution, eelgrass distribution variation). The extent of habitat alteration or loss of spawning substrate due to vessel-related prop-scour or water quality degradation is not quantified. Ambient water quality monitoring for toxic substances is limited. <p>Regulatory Gaps:</p> <ul style="list-style-type: none"> The limited knowledge of cumulative and indirect effects limits the ability of regulatory agencies to address some threats. Regulations manage the shoreline through site-by-site consideration of development, which does not provide or allow for ecosystem-based management. County staff is not available to assess the cumulative impacts of overwater structures. | <ul style="list-style-type: none"> Conduct an East Kitsap Nearshore Assessment (target Oct. 2007). The assessment will: 1) conduct a baseline characterization of the East Kitsap nearshore environment and assess its ecological health and function, 2) identify restoration and preservation opportunities and develop a strategy for ranking and prioritizing opportunities, and 3) develop a management framework based on functions and processes of nearshore ecology. The assessment will provide a baseline from which results of nearshore protection / restoration actions may be evaluated allowing an adaptive management approach to future nearshore activities. The methodology used will be the same as that used by the City of Bainbridge Island. The nearshore assessment will use existing forage fish data (not budgeted to do a new comprehensive forage fish survey). Consider the adoption in 2007 of the Kitsap County Draft Shoreline Environmental Designations (subject to the required public review and adoption process), which include dual designations for some areas that include important habitat types or forage fish spawning. Dual designations provide one designation for the above the ordinary high water mark (OHWM) to reflect current and surrounding land uses and a more restrictive designation for nearshore areas below the OHWM. Update the County’s Shoreline Master Program (due 2011). This will include: <ul style="list-style-type: none"> An evaluation of the criteria for allowing docks and piers that considers the protection of herring habitat. Identification of herring habitat spawning areas as “habitats of local importance” with the possible requirement for habitat management plans. Consideration of cumulative effects from overwater structures during the update of the SMP (<i>e.g.</i>, build-out scenarios with overwater structures). Take into account processes that control functions. The gathering of information from studies that will be used to inform land use planners and managers on how to best manage natural resources. Consideration of regulations to encourage community and joint-use docks vs. single-family docks. Actively seek funding to support the protection of existing herring spawning areas. | <ul style="list-style-type: none"> Seek funding to conduct a comprehensive forage fish spawning survey to update documentation & maps. Develop methods to quantify cumulative effects from overwater structures. Develop a method of identifying, and develop long-range planning tools to manage, cumulative impacts of shoreline development, armoring and stormwater on herring spawning areas. Develop incentive programs to encourage community and joint-use docks vs. single-family docks. Develop education and outreach programs which may include: <ul style="list-style-type: none"> Funding an Education / Outreach position Implementing a shoreline stewardship program Conducting shoreline educational workshops Developing a video on how salmon are using Kitsap and what citizens can do to protect and improve conditions Offer a “Sound Boater” Program to educate recreational boaters on best management practices (BMPs) for boating. |

Table 6.1. East Kitsap WRIA 15 Habitat Analysis Matrix

| Species or Critical Habitat Type (Description and Functions provided to salmon) | Potential Threats & Stressors | Protective Measures Implemented by Kitsap County | Science & Regulatory Gaps | Measures Planned to Address Threats/Gaps & How | Possible Actions if Funding were Available |
|---|---|--|--|---|---|
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Surf Smelt (<i>Hypomesus pretiosus</i>) & Pacific sand lance (<i>Ammodytes hexapterus</i>)</p> <p>Surf Smelt:</p> <ul style="list-style-type: none"> General: Surf smelt are obligate spawners on the upper beach, with a specific mixture of coarse sand & pea gravel. Freshwater seepage areas or overhanging vegetation may be preferred spawning habitat due to lower fluctuation in gravel moisture and temperature. Spawning in Kitsap: See Maps #2 & 2a. There are many documented beaches throughout upper intertidal of protected beaches. Function to salmon: Adult salmon eat smelt but to a lesser extent than sand lance and herring (Gearin <i>et al.</i>, 1994). <p>Pacific sand lance:</p> <ul style="list-style-type: none"> General: Sand lance are thought to be obligate spawners in the upper beach, over a variety of beach substrates, including soft sandy beaches, muddy low energy beaches & beaches of higher energy w/ gravel up to 3-cm diameter (Pentilla 1995, WDFW 2002a). Sand Lance Spawning in Kitsap: See Maps #3 & 3a. There are many documented beaches throughout upper intertidal of protected Kitsap beaches. However, sand lance spawning in Kitsap is the least understood of the forage fish (Small, WDFW, personal communication, 2005). Function to salmon: On average, 35% of juvenile salmon diets are comprised of sand lance and are particularly important to juvenile Chinook, where 60 percent of their diets are sand lance (WDFW, at http://wdfw.wa.gov/fish/forage/lance.htm, 2005). <p>Healthy sand lance and smelt populations support the following Viable Salmon Population (VSP) parameters:</p> <ol style="list-style-type: none"> Abundance: Supported directly as food source. Population growth rate: Supported directly as food source. Spatial structure: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. Diversity: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. | <ul style="list-style-type: none"> Shoreline armoring can have effects on physical processes—primarily sediment transport—that can reduce the number and diversity of habitats (Douglas and Pickel 1999). These modifications can have effects on nearshore processes and the ecology of spawning habitat for surf smelt and sand lance. Armoring can also reduce prey production and refuge areas for juvenile salmonids (Macdonald <i>et al.</i> 1994; Allee 1982). Kitsap Focus: Approximately 1/3 of the unincorporated shoreline is armored. Of the approximately 8,000 shoreline lots, 5,000 are developed. Between 1999 and 2004 there have been 192 building permits submitted for constructions of bulkheads. The majority of those would have been for replacement or repairs (as the county is very conservative about issuing permits for new bulkheads). Approximately 10–20% are new bulkheads (R. Beam, <i>personal communication</i> 2005). Past shoreline armoring impacts included direct removal of habitat by bulkhead construction and fill. Kitsap Focus: It is not known how much habitat was lost in East Kitsap. The nearshore assessment will look at historical surveys (T-sheets) to get an idea of how much habitat was lost due to direct impacts such as fill and bulkheads. Removal of trees and other shoreline vegetation can increase erosion and decrease shading. Areas with shading have been found to experience greater egg viability than areas without shade (Pentilla, 2001. Proceeding from PS Research Conference) Kitsap Focus: Vegetation removal associated with shoreline armoring is a common occurrence. The extent of vegetation removal is not documented. | <p>Federal: Corps Section 404 & Section 10 permits initiate ESA Section 7 consultations & Essential Fish Habitat consultations. The Corps’s responsibility includes development activities below the mean, higher-water mark.</p> <p>State: All documented forage fish spawning sites in Washington are considered “salt water habitats of special concern” and have been given “no net loss” protection in the application of the “Hydraulic Code Rules,” WAC 220–110. Jurisdiction stops at ordinary high-water line.</p> <p>Kitsap County: The County’s Shoreline Management Master Program (SMP) is the primary regulatory tool. The SMP specifies that a geotechnical survey must be conducted to document that a residence is threatened by erosion if a shoreline permit is to be approved. A shoreline permit to replace or repair an existing bulkhead must document, through a geotechnical survey that the residence is threatened and must show that soft bank protection techniques are not possible¹. The County relies extensively on WDFW habitat biologists to provide habitat expertise that is otherwise not available at the county due to lack of staff. The shoreline planners said this relationship is very helpful.</p> <p>The Kitsap County Critical Areas Ordinance (CAO) (Title 19 Kitsap County Code) requires a 35-ft. buffer and 15-ft. building set-back for marine shorelines designated as Urban, Semi-Rural, Rural and Conservancy in the SMP. Shorelines designated as Natural require a 100-ft. buffer and 15-ft. building set-backs. All buffers require the maintenance of native vegetation; however, clearing for views is allowed.</p> <p>Under the SMP, the removal of “danger trees” in shoreline areas is subject to case by case evaluation.</p> | <p>Science Gaps:</p> <ul style="list-style-type: none"> Current knowledge and understanding of the cumulative effects of shoreline armoring on spawning habitat are limited. Sand lance spawning areas are the least understood (only first recognized in 1989). It is the most documented food source for Chinook salmon, but the documented habitat is probably under-represented (Small, WDFW, personal communication 2005). Surf smelt documentation is more comprehensive, but funding was cut in the mid 1990s so the documentation is done site-by-site and does not take into account protracted spawning (9-12 months). Need updated comprehensive survey for sand lance and surf smelt; largest gap in documentation is from Kingston to Foulweather Bluff (Small, WDFW, personal communication, 2005). <p>Regulatory Gaps:</p> <ul style="list-style-type: none"> The limited knowledge of “cumulative effects” and how they are assessed or measured limits the ability of regulatory agencies to address these effects. Regulations manage the shoreline through site-by-site consideration, which does not provide or allow for ecosystem-based management. County staff is unavailable to look at cumulative impacts. | <ul style="list-style-type: none"> Complete an East Kitsap Nearshore Assessment (target Oct. 2007). The nearshore assessment will use existing forage fish data (not budgeted to do a new comprehensive forage fish survey). Consider the adoption in 2007 of the Kitsap County Draft Shoreline Environmental Designations (subject to the required public review and adoption process), which include dual designations for some areas that include important habitat types or forage fish spawning. Update the County’s Shoreline Master Program (due 2011). This will include: <ul style="list-style-type: none"> An evaluation of the criteria for allowing shoreline armoring that considers the protection of sand lance & surf smelt spawning habitat. Identification of sand lance and surf smelt habitat spawning areas as “habitats of local importance” with the possible requirement for habitat management plans. Consideration of cumulative effects from overwater structures during the update of the SMP (e.g., build-out scenarios with overwater structures). Take into account processes that control functions. The gathering of information from studies that will be used to inform land use planners and managers on how to best manage natural resources. Consideration of regulations to encourage community and joint-use docks vs. single-family docks. Consider adoption of proposed revisions to the Critical Areas Ordinance, including extending buffers for shorelines designated as “Conservancy” to 50 ft. and adopting Ecology’s wetland rating system and recommended flexible buffers options. Actively seek funding to support protection and restoration of existing sand lance and surf smelt spawning areas. | <ul style="list-style-type: none"> Seek funding to conduct a comprehensive forage fish spawning survey to update documentation & maps, especially for sand lance and for the area from Kingston to Foulweather Bluff. Develop a method of identifying, and develop long-range planning tools to manage, cumulative impacts of shoreline development, armoring and stormwater on sand lance and surf smelt spawning areas. Develop incentive programs to encourage the removal of unnecessary shoreline armoring and the use of soft-bank protection. (e.g. Public Benefit Rating System) Develop incentive programs to encourage community and joint-use docks vs. single-family docks. Develop education and outreach programs which may include: <ul style="list-style-type: none"> Funding an Education/ Outreach position Implementing a shoreline stewardship program Conducting shoreline educational workshops Developing a video on how salmon are using Kitsap and what citizens can do to protect and improve conditions Offer a “Sound Boater” Program to educate recreational boaters on BMPs for boating. Seek funding to develop a beach nourishment program to restore lost sediment supply to beaches and restore / maintain spawning area substrate. |

¹ However, beach erosion at some level was often taking place and experts debated the causes of erosion and if the rate of erosion was excessive or within the expected range. Local staff and state biologists are hampered by the inability to challenge the geotechnical analysis in an expert capacity and few bulkhead applications have been denied shoreline armoring. (Small, WDFW, *personal communication* 2005)

Table 6.1. East Kitsap WRIA 15 Habitat Analysis Matrix

| | Species or Critical Habitat Type (Description and Functions provided to salmon) | Potential Threats & Stressors | Protective Measures Implemented by Kitsap County | Science & Regulatory Gaps | Measures Planned to Address Threats/Gaps & How | Possible Actions if Funding were Available |
|--|--|--|--|--|--|---|
| Eelgrass (<i>Zostera marina</i>) Habitat | <ul style="list-style-type: none"> General: Low intertidal and upper subtidal zone, along protected and semi-protected shorelines. Eelgrass in Kitsap: See Maps 4 & 4a. Eelgrass occupies an estimated 48% of East Kitsap shoreline (Washington State DNR 2001). Function to salmon: Habitat for fish. Juvenile chum and Chinook are often found feeding and residing in and around eelgrass. Eelgrass is a major contributor to the detritus used in both nearshore and deep-water food webs. <p>Healthy eelgrass areas support the following Viable Salmon Population (VSP) parameters:</p> <ol style="list-style-type: none"> Abundance: Supported directly by providing shelter; indirectly as the basis for food webs that support prey populations. Population growth rate: Supported directly by providing shelter; indirectly as the basis for food webs that support prey populations. Spatial structure: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. Diversity: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. | <ul style="list-style-type: none"> Construction of overwater structures (floating docks, fixed piers, marinas, mooring buoys) can directly impact eelgrass by shading or by physical scouring. Kitsap Focus: Unknown Kitsap specific studies. See Pacific herring regarding overwater structures. Vessels commonly associated with many overwater structures can cause prop scouring of sediment and submerged vegetation. Kitsap Focus: No specific Kitsap studies. Water quality impacts are another potential issue associated with overwater structures and sewage outfalls. In addition, sediments loads carried by streams may limit available light. Kitsap Focus: No specific information available. Unregulated mooring buoys can scour & shade marine vegetation. Kitsap Focus: The number of buoys showing up locally outnumbers the permit applications. Once a buoy is placed it is difficult to find owners (Small, WDFW <i>personal communication</i>). Observations are qualitative and the extent has not been documented. Boats anchoring in eelgrass and not using designated buoys cause scouring from anchor and anchor chain. Kitsap Focus: There are lots of examples throughout the shoreline (Small, WDFW, <i>personal communication</i> 2005). Observations are qualitative. | <p>Federal: Corps Section 404 & Section 10 permits initiate ESA Section 7 consultations & Essential Fish Habitat consultations. The Corps’s responsibility includes development activities below the mean, higher-water mark.</p> <p>State: All documented eelgrass locations in Washington are considered “salt water habitats of special concern” and have been given “no net loss” protection in the application of Washington Administrative Code (WAC) “Hydraulic Code Rules.” Jurisdiction stops at ordinary high-water line.</p> <p>Kitsap County: The County’s Shoreline Management Master Program (SMP) is the primary regulatory tool. County staff relies extensively on WDFW biologists to provide habitat expertise to avoid impacting eelgrass or forage fish spawning habitat. Difficult to deny construction of docks and piers as a feature of single family homes due to existing policies and development standards in SMP—possession of an approved Hydraulic Project Approval permit from the State diminishes local ability to restrict development based on environmental considerations (Beam, <i>personal communication</i> 2005).</p> | <p>Science Gaps:</p> <ul style="list-style-type: none"> While East Kitsap shorelines support aquatic vegetation the aerial extent and condition of eelgrass has not been accurately and comprehensively surveyed. Current knowledge and understanding of the cumulative effects of overwater structures and shoreline development on eelgrass habitat are limited (proximity, <i>etc.</i>). While eelgrass is known to be important, the ecology of eelgrass—and the Chinook salmon use of it—is still under study. Research topics include landscape scale (patchy vs. dense) preferences; food sources; variation in distribution over time. Impacts of increased <i>Ulva</i> sp. and <i>Sargassum</i> spp. distribution. There are uncertainties regarding algal population dynamics (<i>e.g.</i> <i>Ulva</i> blooms, Sargassum introduction, attached vs. unattached algae contribution, seasonal/inter-annual eelgrass distribution variation). <p>Regulatory Gaps:</p> <ul style="list-style-type: none"> The limited knowledge of cumulative effects limits the ability of regulatory agencies to address these effects. Regulations manage the shoreline through site-by-site consideration, which does not provide or allow for ecosystem-based management. County staff is not available to look at cumulative impacts. The County does not have a count of the number of un-permitted buoys, and it is difficult to find the owners once buoys have been placed. | <ul style="list-style-type: none"> Complete an East Kitsap Nearshore Assessment (target Oct. 2007). The nearshore assessment will use existing eelgrass data and groundtruth. Consider the adoption in 2007 of the Kitsap County Draft Shoreline Environmental Designations (subject to the required public review and adoption process). Update the County’s Shoreline Master Program (due 2011). This will include: <ul style="list-style-type: none"> An evaluation of the criteria for allowing development activities in documented eelgrass habitat. Identification of eelgrass habitat areas “habitats of local importance” with the possible requirement for habitat management plans. Consideration of cumulative effects from shoreline development during the update of the SMP (<i>e.g.</i>, build-out scenarios with overwater structures). Consider the use of long-range planning tools instead of site-by-site overwater structure permits to address potential impacts to eelgrass areas. The gathering of information from studies that will be used to inform land use planners and managers on how to best manage natural resources. Consideration of regulations to encourage community and joint-use docks vs. single-family docks. Actively seek funding to support protection and restoration of eelgrass habitat areas. Achieve compliance with NPDES (National Pollutant Discharge Elimination System) Phase II requirements, pending review by Ecology. | <ul style="list-style-type: none"> Develop methods to quantify cumulative effects from overwater structures and other stressors. Develop long-range planning tools to address potential impacts to eelgrass areas instead of the use of site-by-site overwater structure permits. Develop incentive programs to encourage community and joint-use docks vs. single-family docks. Develop education and outreach programs which may include: <ul style="list-style-type: none"> Funding an Education / Outreach position Implementing a shoreline stewardship program Conducting shoreline educational workshops Developing a video on how salmon are using Kitsap and what citizens can do to protect and improve conditions Develop “Volunteer Anchor Free Zones,” modeled after Jefferson County. Provide designated moorage buoys at all public facilities and install marker buoys showing boaters where eelgrass is located so they can avoid anchoring there. Monitor eelgrass sites over time to assess health and trend. |

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| Species or Critical Habitat Type (Description and Functions provided to salmon) | Potential Threats & Stressors | Protective Measures Implemented by Kitsap County | Science & Regulatory Gaps | Measures Planned to Address Threats/Gaps & How | Possible Actions if Funding were Available |
|--|--|--|--|---|---|
| <p style="text-align: center; transform: rotate(-90deg); font-weight: bold;">Kelp/Macro-Algae Habitat</p> <ul style="list-style-type: none"> General: Intertidal and subtidal distribution. Ubiquitous distribution of macroalgae throughout East Kitsap County. Kelp distribution in Kitsap: See Maps 5 & 5a: Kelp beds occur along approximately 21% of East Kitsap Shorelines (WDNR 2001). Subtidal distribution adjacent to exposed shorelines and high current areas in association with rock or larger cobble substrate. Includes surface canopy forming and submerged species. <p>Functions to salmon:</p> <ul style="list-style-type: none"> Algae are contributors to the detritus used in both nearshore and deep-water food webs. Herring spawning habitat. Habitat for fish and invertebrates; juvenile and subadult salmon have been noted in kelp forests. <p>Healthy macroalgae/kelp habitats support the following Viable Salmon Population (VSP) parameters:</p> <ol style="list-style-type: none"> Abundance: Supported directly by providing shelter; indirectly as the basis for food webs that support prey populations. Population growth rate: Supported directly by providing shelter; indirectly as the basis for food webs that support prey populations. Spatial structure: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. Diversity: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. | <ul style="list-style-type: none"> Construction of overwater structures (floating docks, fixed piers, marinas, mooring buoys) can directly impact macroalgae by shading or by physical scouring. Kitsap Focus: Unknown Kitsap specific studies. See Pacific herring regarding overwater structures. Shoreline armoring can affect the sediment transport processes along shorelines and increase wave energy resulting in coarser substrates and steeper beach profiles. Some species of macroalgae are harvested recreationally for direct human consumption. Water quality: Eutrophication may lead to an overabundance of single species of algae, such as <i>Ulva</i> sp., to the exclusion of a more natural assemblage of species. In addition, turbidity can lead to lower light regimes, decreasing productivity. <p>Kitsap Specific: No specific studies have been identified at this point, however this will be considered during the nearshore assessment.</p> | <p>Federal: Corps Section 404 & Section 10 permits initiate ESA Section 7 consultations & Essential Fish Habitat consultations. The Corps’s responsibility includes development activities below the mean, higher-water mark.</p> <p>State: All documented kelp locations in Washington are considered “salt water habitats of special concern” and have been given “no net loss” protection in the application of Washington Administrative Code (WAC) “Hydraulic Code Rules.” Jurisdiction stops at ordinary high-water line.</p> <p>Kitsap County: The County’s Shoreline Management Master Program (SMP) is the primary regulatory tool. The SMP specifies that a geotechnical survey must be conducted to document that a residence is threatened by erosion if a shoreline permit is to be approved. A shoreline permit to replace or repair an existing bulkhead must document, through a geotechnical survey that the residence is threatened and must show that soft bank protection techniques are not possible². County staff rely extensively on WDFW biologists to provide habitat expertise to avoid impacting habitat. Difficult to deny construction of docks and piers as a feature of single family homes due to existing policies and development standards in SMP—possession of an approved HPA from the State diminishes local ability to restrict development based on environmental considerations (Beam, personal communication 2005).</p> | <p>Science Gaps:</p> <ul style="list-style-type: none"> Actual use of macroalgae assemblages and kelp beds by salmon is poorly documented. It is not known how much habitat was lost in East Kitsap due to armoring and filling to create upland building sites. Impacts of increased <i>Ulva</i> sp. and <i>Sargassum</i> spp. distribution. Effects of eutrophication have not been studied locally. Nutrient data are not currently being collected in a timely manner. <p>Regulatory Gaps:</p> <ul style="list-style-type: none"> The limited knowledge of cumulative effects limits the ability of regulatory agencies to address these effects. Regulations manage the shoreline through site-by-site consideration, which does not provide or allow for ecosystem-based management. County staff is not available to look at cumulative impacts. | <ul style="list-style-type: none"> Complete an East Kitsap Nearshore Assessment (target Oct. 2007). Note the abundance of <i>Ulva</i> sp. at field sites. The nearshore assessment will also look at historical surveys (T-sheets) to get an idea of how much habitat was lost due to direct impacts such as fill and bulkheads. Consider the adoption in 2007 of the Kitsap County Draft Shoreline Environmental Designations (subject to the required public review and adoption process) Update the County’s Shoreline Master Program (due 2011). This will include: <ul style="list-style-type: none"> Consideration of kelp habitat areas as “habitats of local importance” with the possible requirement for habitat management plans. Consideration of cumulative effects shoreline activities during the update of the SMP. The gathering of information from studies that will be used to inform land use planners and managers on how to best manage natural resources. Consider adoption of proposed revisions to the Critical Areas Ordinance, including extending buffers for shorelines designated as “Conservancy” to 50 ft. and adopting Ecology’s wetland rating system and recommended flexible buffers options. Actively seek funding to support protection and restoration of kelp beds and macroalgae habitat areas. Achieve compliance with NPDES (National Pollutant Discharge Elimination System) Phase II requirements, pending review by Ecology. | <ul style="list-style-type: none"> Seek resources to fully fund the Kitsap County / Kitsap Health District Pollution Identification and Correction (PIC) program. Expand the PIC program to look at nutrient loading. Develop incentive programs to encourage the removal of unnecessary shoreline armoring and the use of soft bank protection. (e.g. Public Benefit Rating System) Develop education and outreach programs which may include: <ul style="list-style-type: none"> Funding an Education / Outreach position Implementing a shoreline stewardship program Conducting shoreline educational workshops Developing a video on how salmon are using Kitsap and what citizens can do to protect and improve conditions. |

² However, beach erosion at some level was often taking place and experts debated the causes of erosion and if the rate of erosion was excessive or within the expected range. Local staff and state biologists are hampered by the inability to challenge the geotechnical analysis in an expert capacity and few bulkhead applications have been denied shoreline armoring. (Small, WDFW, personal communication 2005)

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|--|--|---|--|---|---|
| <p style="text-align: center; writing-mode: vertical-rl; transform: rotate(180deg);">Native Marine Riparian Habitat</p> <p>General: The role of marine riparian vegetation is not clearly understood. Much of the functions associated with this element are derived in part from studies focused on fresh water riparian functions and limited site-specific nearshore studies.</p> <p>Functions to salmon:</p> <ul style="list-style-type: none"> • Water quality protection: riparian vegetation serves as a sink for upland derived contaminants. It also traps sediments. • Hydrology regulation: riparian vegetation intercepts and regulates storm water inputs to the nearshore environment. • Shade: riparian vegetation supports viability of forage fish eggs (Pentilla, 2001) and presumably viable populations of other prey organisms subject to mortality due to increased desiccation. • Organic/Nutrient input: Riparian vegetation contributes organic materials utilized in nearshore food webs. • Prey input for salmon: direct input of insects and other terrestrial organisms have been documented as food source for juvenile salmon (Brennan, 2004). • Bank stabilization: vegetation root systems stabilize shorelines and contribute to regulation of sediment supply. • Large woody debris (LWD): provides habitat structure, assumed to provide refuge and cover for juvenile salmon and other marine organisms. <p>Healthy riparian vegetation support the following Viable Salmon Population (VSP) parameters:</p> <ol style="list-style-type: none"> 1. Abundance: Supported directly by providing food and shelter. 2. Population growth rate: Supported directly by providing food and shelter. 3. Spatial structure: Supported directly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. 4. Diversity: Supported directly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. | <ul style="list-style-type: none"> • Shoreline develop is associated with increased impervious surfaces and runoff and loss of riparian vegetation effecting water quality and potential impacts to salmon transitioning from fresh to saltwater. • Shoreline armoring is typically associated with loss of riparian vegetation and the corresponding function loss. • Altered riparian vegetation due to shoreline modifications may lead to a decrease in primary and secondary production in the nearshore (<i>i.e.</i>, reduced prey abundance and variety). • Removal of trees and other shoreline vegetation can increase erosion and decrease shading. Areas with shading have been found to experience greater egg viability than areas without shade (Pentilla, 2001. Proceedings from Puget Sound Research Conference). <p>Kitsap Focus: Approximately 1/3 of unincorporated shoreline is armored. Of the approximately 8,000 shoreline lots, 5,000 are developed. Shoreline that is armored is usually accompanied with loss of native marine riparian habitat. Vegetation removal associated with shoreline armoring is a common occurrence. The extent of vegetation removal is not documented.</p> <p>The 2003 <i>Kitsap Salmon Refugia Report</i> (May and Peterson, 2003) classified a significant portion of the East Kitsap shoreline areas, from Point No Point to Applecove Point (See Map 6) as Category A refugia (“priority refugia with natural ecological integrity”). The majority of remaining East Kitsap nearshore and estuarine habitat areas were designated Category D refugia (“potential refugia with altered ecological integrity”) primarily due to shoreline modification and loss of riparian vegetation. May and Peterson (2003) also note that their assessment of nearshore habitat conditions for salmon should be considered “interim” due to the sparse data.</p> | <p>Federal: N/A</p> <p>State: Marine shorelines of Puget Sound are shorelines of statewide significance under the Shoreline Management Act. Regulation is <i>per</i> the county SMP.</p> <p>Kitsap County: The Kitsap County Critical Areas Ordinance (Title 19 Kitsap County Code) requires a 35-ft. buffer and 15-ft. building setback for marine shorelines designated as Urban, Semi-Rural, Rural and Conservancy in the SMP. Shorelines designated as Natural require a 100-ft. buffer and 15-ft. building setback. All buffers require the maintenance of native vegetation; however, clearing for views is allowed.</p> <p>The Critical Areas Ordinance also currently classifies all streams in the County where ESA-listed salmonids are present as Category I wetlands, and requires a 200-ft. buffer. Estuarine areas that are associated with streams which do not contain listed salmon may also be categorized as Category II wetlands with a buffer requirement of 100 feet.</p> <p>Under the SMP, the removal of “danger trees” in shoreline areas is subject to case by case evaluation.</p> <p>The Kitsap County Public Works Department has adopted the ESA Section 4(d)-compliant regional road maintenance guidelines and will continue to operate according to those principles.</p> | <p>Science Gaps:</p> <ul style="list-style-type: none"> • There is limited marine riparian buffer research that is specific to Puget Sound. • Most marine buffer recommendations are based on studies conducted at riverine and freshwater locations. • It is not known if non-native species function in a manner similar to that of native species. • How can we use adaptive management to vary buffer areas to provide suitable function? <p>Regulatory Gaps:</p> <ul style="list-style-type: none"> • Enforcement: it is hard to enforce what happens in buffers after the permits are issued. There is currently no monitoring. • Lack of regulatory awareness by property owners who purchase lots that are already developed. Owners may not know that their property is subject to CAO. | <ul style="list-style-type: none"> • Complete an East Kitsap Nearshore Assessment (target Oct. 2007). The nearshore assessment will also look at historical surveys (T-sheets) to get an idea about how much habitat was lost due to direct impacts (such as fill and bulkheads). • Consider the adoption in 2007 of the Kitsap County Draft Shoreline Environmental Designations (subject to the required public review and adoption process), which include dual designations for some areas that include important habitat types or forage fish spawning. Dual designations provide one designation for the above the ordinary high water mark (OHWM) to reflect current and surrounding land uses and a more restrictive designation for nearshore areas below the OHWM. • Consider adoption of proposed revisions to the Critical Areas Ordinance, including extending buffers for shorelines designated as “Conservancy” to 50 ft. and adopting Ecology’s wetland rating system and recommended flexible buffers options. • Actively seek funding to support protection and restoration of marine riparian areas. • Kitsap County encourages the use of low impact development (LID) techniques, which conserve natural areas and minimize development impacts. The County is currently reviewing its development ordinance relative to LID issues under a contract with the Puget Sound Action Team. • Achieve compliance with Clean Water Act NPDES Phase II requirements, pending review by the Washington Dept. of Ecology. | <ul style="list-style-type: none"> • Revegetate public lands wherever possible. • Protect existing riparian habitat through acquisitions and conservation easements wherever possible. • Seek resources to fund more enforcement activities. • Develop incentive programs to encourage removing unnecessary shoreline armoring and use of soft bank protection. (<i>e.g.</i> Public Benefit Rating System) • Develop education and outreach programs which may include: <ul style="list-style-type: none"> ○ Funding an Education / Outreach position ○ Implementing a shoreline stewardship program ○ Conducting shoreline educational workshops ○ Developing a video on how salmon are using Kitsap and what citizens can do to protect and improve conditions. • Support development of native vegetation workshops for local shoreline owners and master gardeners (using the Mason County model). |

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|--|---|---|---|---|--|---|
| Tidal Marsh Habitat (Vegetated) | <p>General: Kitsap County doesn't have much of the tidal vegetated marsh habitat from large river systems (as in the case of the studies cited below), but does have marsh habitat in upper tidal inlets. This may not be the county's habitat of highest importance for Chinook, but may be more so from a multi-species approach.</p> <p>Functions to salmon:</p> <ul style="list-style-type: none"> • Primary production • Juvenile fish and invertebrate production support • Adult fish and invertebrate foraging • Salmonid osmoregulation and overwintering habitat • Water quality • Detrital food chain production • Wave buffering • Juvenile salmon reside in tidal marshes and forage on prey resources produced in and imported to the marsh system, where significant growth has been recorded (Shreffler <i>et al.</i> 1992). Tidal marshes are believed to be one of the most important habitats contributing to juveniles salmon growth and survival (Bottom <i>et al.</i> 2001). <p>Viable Salmon Population (VSP) Parameters:</p> <ol style="list-style-type: none"> 1. Abundance: Supported directly by providing shelter; indirectly as the basis for food webs that support prey populations. 2. Population growth rate: Supported directly by providing shelter; indirectly as the basis for food webs that support prey populations. 3. Spatial structure: Supported directly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. 4. Diversity: Supported directly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. | <ul style="list-style-type: none"> • Disturbed community structure, disturbed plant growth, presence of non-native species, buffer encroachment, runoff scour, alteration of dendritic tidal channels, alteration of sediment dynamics, loss of upland hydraulic connectivity, elevated soil contaminant concentrations, presence of man-made debris, physical disturbances from dredging, filling and diking, & chemical contamination. • Past land use practices; similar to tidal flats, these are likely areas for development. | <p>Federal: Corps Section 404 & Section 10 permits initiate ESA Section 7 consultations & Essential Fish Habitat consultations. The Corps's responsibility includes development activities below the mean, higher-water mark.</p> <p>State: Tidal marsh areas in Washington are considered "wetland and saltwater habitats of special concern" and have been given "no net loss" protection in the application of the "Hydraulic Code Rules," WAC 220-110. Jurisdiction stops at ordinary high-water line.</p> <p>Kitsap County: The Kitsap County Critical Areas Ordinance (CAO) (Title 19 Kitsap County Code) requires a 35-ft. buffer and 15-ft. building set-back for marine shorelines designated as Urban, Semi-Rural, Rural and Conservancy in the SMP. Shorelines designated as Natural require a 100-ft. buffer and 15-ft. building set-backs. All buffers require the maintenance of native vegetation; however, clearing for views is allowed.</p> <p>The Kitsap County Critical Areas Ordinance (CAO) (Title 19 Kitsap County Code) requires the protection of wetlands and their buffers.</p> | <p>Science Gaps:</p> <ul style="list-style-type: none"> • It is not known how much salt marsh habitat has been lost in East Kitsap due to filling, restriction of tidal ebb and flow, and other shoreline development. <p>Regulatory Gaps:</p> <ul style="list-style-type: none"> • Enforcement: it is hard to enforce what happens in buffers after the permits are issued. There is currently no monitoring. • Lack of regulatory awareness by property owners who purchase lots that are already developed. Owners may not know that their property is subject to CAO. • The limited knowledge of cumulative effects limits the ability of regulatory agencies to address these effects. • Regulations manage the shoreline through site-by-site consideration, which does not provide or allow for ecosystem-based management. • County staff is not available to look at cumulative impacts. | <ul style="list-style-type: none"> • Complete an East Kitsap Nearshore Assessment (target Oct. 2007). • Consider the adoption in 2007 of the Kitsap County Draft Shoreline Environmental Designations (subject to the required public review and adoption process). • Consider adoption of proposed revisions to the Critical Areas Ordinance, including extending buffers for shorelines designated as "Conservancy" to 50 ft. and adopting Ecology's wetland rating system and recommended flexible buffers options. • Actively seek funding to support protection and restoration of tidal marsh areas. | <ul style="list-style-type: none"> • Develop a method of identifying, and develop long-range planning tools to manage, cumulative impacts of shoreline development. • Restore and revegetate salt marsh habitat on public lands wherever possible. • Protect existing salt marsh habitat through acquisitions and conservation easements wherever possible. • Develop incentive programs to encourage removing unnecessary shoreline armoring (<i>e.g.</i> Public Benefit Rating System) • Develop education and outreach programs which may include: <ul style="list-style-type: none"> ○ Funding an Education / Outreach position ○ Implementing a shoreline stewardship program ○ Conducting shoreline educational workshops ○ Developing a video on how salmon are using Kitsap and what citizens can do to protect and improve conditions. • Support development of native vegetation workshops for local shoreline owners and master gardeners (using the Mason County model). |

Table 6.1. East Kitsap WRIA 15 Habitat Analysis Matrix

| | Species or Critical Habitat Type (Description and Functions provided to salmon) | Potential Threats & Stressors | Protective Measures Implemented by Kitsap County | Science & Regulatory Gaps | Measures Planned to Address Threats/Gaps & How | Possible Actions if Funding were Available |
|--------------------------|---|---|--|---|--|--|
| Beaches (sand and rocky) | <p>General: Beaches (sand and rocky) and backshore areas.</p> <p>Functions to salmon:</p> <ul style="list-style-type: none"> • Primary production • Nutrient cycling • Refuge for multiple species • Prey production for juvenile salmon • Forage fish spawning habitat <p>Viable Salmon Population (VSP) Parameters:</p> <ol style="list-style-type: none"> 1. <u>Abundance</u>: Supported indirectly as a substrate for food webs that support prey populations. 2. <u>Population growth rate</u>: Supported indirectly as a substrate for food webs that support prey populations. 3. <u>Spatial structure</u>: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. 4. <u>Diversity</u>: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. | <ul style="list-style-type: none"> • Fecal and chemical contamination, alteration of natural habitats, alteration of sediment supply, alteration of groundwater hydrology, loss of riparian habitat. • Loss of large woody debris / driftwood. • Shoreline armoring and filling can have effects on physical processes—sediment transport, wave force—that can result in erosion of the remaining beach and reduce the number and diversity of habitats (Douglas and Pickel 1999). These modifications can have effects on nearshore processes and the ecology of spawning habitat for surf smelt and sand lance. Armoring can also reduce prey production and refuge areas for juvenile salmonids (Macdonald <i>et al.</i> 1994; Allee 1982). Kitsap Focus: Approximately 1/3 of the unincorporated shoreline is armored. Of the approximately 8,000 shoreline lots, 5,000 are developed. Between 1999 and 2004 there have been 192 building permits submitted for constructions of bulkheads. The majority of those would have been for replacement or repairs (as the county is very conservative about issuing permits for new bulkheads). Approximately 10–20% are new bulkheads (R. Beam, <i>personal communication</i> 2005). <p>Past shoreline armoring impacts included direct removal of habitat by bulkhead construction and fill. Kitsap Focus: It is not known how much habitat has been lost in East Kitsap.</p> | <p>Federal: Corps Section 404 & Section 10 permits initiate ESA Section 7 consultations & Essential Fish Habitat consultations. The Corps’s responsibility includes development activities below the mean, higher-water mark.</p> <p>State: Such areas in Washington with known forage fish spawning beds, lingcod or rockfish settlement and nursery areas are considered “saltwater habitats of special concern” and have been given “no net loss” protection in the application of the “Hydraulic Code Rules,” WAC 220–110. Jurisdiction stops at ordinary high-water line.</p> <p>Kitsap County: The County’s Shoreline Management Master Program (SMP) is the primary regulatory tool. The SMP specifies that a geotechnical survey must be conducted to document that a residence is threatened by erosion if a shoreline permit is to be approved. A shoreline permit to replace or repair an existing bulkhead must document, through a geotechnical survey that the residence is threatened and must show that soft bank protection techniques are not possible³. County staff rely extensively on WDFW biologists to provide habitat expertise to avoid impacting habitat. It is difficult to deny construction of docks and piers as a feature of single family homes due to existing policies and development standards in SMP—possession of an approved HPA from the State diminishes local ability to restrict development based on environmental considerations.</p> <p>The Kitsap County Critical Areas Ordinance (Title 19 Kitsap County Code) requires a 35-ft. buffer and 15-ft. building setback for marine shorelines designated as Urban, Semi-Rural, Rural and Conservancy in the SMP. Shorelines designated as Natural require a 100-ft. buffer and 15-ft. building setback.</p> | <p>Science Gaps:</p> <ul style="list-style-type: none"> • It is not known how much habitat was lost in East Kitsap due to armoring and filling to create upland building sites. • It is not known how drift cell function may already have been altered in East Kitsap. <p>Regulatory Gaps:</p> <ul style="list-style-type: none"> • Enforcement: it is hard to enforce what happens in buffers after the permits are issued. There is currently no monitoring. • Lack of regulatory awareness by property owners who purchase lots that are already developed. Owners may not know that their property is subject to CAO. • The limited knowledge of cumulative effects limits the ability of regulatory agencies to address these effects. • Regulations manage the shoreline through site-by-site consideration, which does not provide or allow for ecosystem-based management. • County staff is not available to look at cumulative impacts. | <ul style="list-style-type: none"> • Complete an East Kitsap Nearshore Assessment (target Oct. 2007). The nearshore assessment will look at historical surveys (T-sheets) to get an idea of how much habitat was lost due to direct impacts such as fill and bulkheads. • Consider the adoption in 2007 of the Kitsap County Draft Shoreline Environmental Designations (subject to the required public review and adoption process). • Actively seek funding to support protection and restoration of beach areas. | <ul style="list-style-type: none"> • Develop a method of identifying, and develop long-range planning tools to manage, cumulative impacts of shoreline development. • Protect existing beach habitats through acquisitions and conservation easements wherever possible. • Develop incentive programs to encourage removing unnecessary shoreline armoring and use of soft bank protection. (<i>e.g.</i> Public Benefit Rating System) • Develop education and outreach programs which may include: <ul style="list-style-type: none"> ○ Funding an Education / Outreach position ○ Implementing a shoreline stewardship program ○ Conducting shoreline educational workshops ○ Developing a video on how salmon are using Kitsap and what citizens can do to protect and improve conditions. • Seek funding to develop a beach nourishment program to restore lost sediment supply to beaches and restore / maintain spawning area substrate. |

³ However, beach erosion at some level was often taking place and experts debated the causes of erosion and if the rate of erosion was excessive or within the expected range. Local staff and state biologists are hampered by the inability to challenge the geotechnical analysis in an expert capacity and few bulkhead applications have been denied shoreline armoring. (Small, WDFW, *personal communication* 2005)

Table 6.1. East Kitsap WRIA 15 Habitat Analysis Matrix

| Species or Critical Habitat Type (Description and Functions provided to salmon) | Potential Threats & Stressors | Protective Measures Implemented by Kitsap County | Science & Regulatory Gaps | Measures Planned to Address Threats/Gaps & How | Possible Actions if Funding were Available |
|---|--|---|--|---|--|
| <p style="text-align: center;">Banks and Bluffs</p> <p>General: Notable eroding banks and bluffs in E. Kitsap include the shoreline from Foulweather Bluff to Port Madison Bay, Murden Cove to Point Monroe, Wing Point to Murden Cove; Fletcher Bay to Arrow Point, Manzanita Bay to Agate Point.</p> <p>Functions to salmon:</p> <ul style="list-style-type: none"> • Source of sediments to beaches • Support for marine riparian vegetation <p>Viable Salmon Population (VSP) Parameters:</p> <ol style="list-style-type: none"> 1. Abundance: Supported indirectly as a substrate for food webs that support prey populations. 2. Population growth rate: Supported indirectly as a substrate for food webs that support prey populations. 3. Spatial structure: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. 4. Diversity: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. | <ul style="list-style-type: none"> • Shoreline and bank armoring and development • Alteration of hydrology, destabilization of banks and bluffs <p>These activities can have effects on physical processes—sediment transport, bank and bluff stability—that can interfere with drift cell function, result in erosion of the remaining beach, slope failures, and reduce the number and diversity of habitats. Shore and bank modifications can have effects on nearshore processes and the ecology of spawning habitat for surf smelt and sand lance. Armoring can also reduce prey production and refuge areas for juvenile salmonids (Macdonald <i>et al.</i> 1994; Allee 1982).</p> <p>Kitsap Focus: Approximately 1/3 of the unincorporated shoreline is armored. Of the approximately 8,000 shoreline lots, 5,000 are developed. Between 1999 and 2004 there have been 192 building permits submitted for constructions of bulkheads. The majority of those would have been for replacement or repairs (as the county is very conservative about issuing permits for new bulkheads). Approximately 10–20% are new bulkheads (R. Beam, <i>personal communication</i> 2005).</p> | <p>Federal: N/A</p> <p>State: The WDFW provides good identification of feeder bluffs.</p> <p>Kitsap County: The County’s Shoreline Management Master Program (SMP) specifies that a geotechnical survey must be conducted to document that a residence is threatened by erosion if a shoreline permit is to be approved. A shoreline permit to replace or repair an existing bulkhead must document, through a geotechnical survey that the residence is threatened and must show that soft bank protection techniques are not possible⁴. County staff rely extensively on WDFW biologists to provide habitat expertise to avoid impacting habitat. Difficult to deny construction of docks and piers as a feature of single family homes due to existing policies and development standards in SMP—possession of an approved HPA from the State diminishes local ability to restrict development based on environmental considerations (Beam, <i>personal communication</i> 2005).</p> <p>The Kitsap County CAO includes identification of geologically hazardous areas, such as eroding bluffs, and requires building setbacks in such areas. Limitations on tightlining seepage and septic systems in such locations are also in the Code.</p> <p>Under the SMP, the removal of “danger trees” in shoreline areas is subject to case by case evaluation.</p> | <p>Science Gaps:</p> <ul style="list-style-type: none"> • The County does not have a good survey of feeder bluffs and functions. • It is not known how drift cell function may already have been altered in East Kitsap. <p>Regulatory Gaps:</p> <ul style="list-style-type: none"> • The limited knowledge of cumulative effects limits the ability of regulatory agencies to address these effects. • Regulations manage the shoreline through site-by-site consideration, which does not provide or allow for ecosystem-based management. • County staff is not available to look at cumulative impacts. | <ul style="list-style-type: none"> • Complete an East Kitsap Nearshore Assessment (target Oct. 2007). • Consider the adoption in 2007 of the Kitsap County Draft Shoreline Environmental Designations (subject to the required public review and adoption process). • Consider adoption of proposed revisions to the Critical Areas Ordinance, including extending buffers for shorelines designated as “Conservancy” to 50 ft. and adopting Ecology’s wetland rating system and recommended flexible buffers options. | <ul style="list-style-type: none"> • Develop a method of identifying, and develop long-range planning tools to manage, cumulative impacts of shoreline and upland development. • Protect existing banks and bluff areas through acquisitions and conservation easements wherever possible. • Develop incentive programs to encourage removing unnecessary shoreline armoring and use of soft bank protection. (<i>e.g.</i> Public Benefit Rating System) • Develop education and outreach programs which may include: <ul style="list-style-type: none"> ○ Funding an Education / Outreach position ○ Implementing a shoreline stewardship program ○ Conducting shoreline educational workshops ○ Developing a video on how salmon are using Kitsap and what citizens can do to protect and improve conditions. • Seek funding to develop a beach nourishment program to restore lost sediment supply to beaches and restore / maintain spawning area substrate. |

⁴ However, beach erosion at some level was often taking place and experts debated the causes of erosion and if the rate of erosion was excessive or within the expected range. Local staff and state biologists are hampered by the inability to challenge the geotechnical analysis in an expert capacity and few bulkhead applications have been denied shoreline armoring. (Small, WDFW, *personal communication* 2005)

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|-----------------|---|---|---|---|--|--|
| Tidal Mud Flats | <p>General: Extensive tidal mud flats are present in areas such as Carpenter Creek/Appletree Cove, Miller Bay, Liberty Bay, Dyes Inlet, Sinclair Inlet, Clam Bay, Pleasant Cove, Manzanita Bay, Murden Cove, Rolling Bay to Point Monroe, Fletcher Bay, Blakely Harbor, and Eagle Harbor. Kitsap county’s protected shallow shoreline habitat is of regional importance in Puget Sound.</p> <p>Functions to salmon:</p> <ul style="list-style-type: none"> • Primary production • Nutrient cycling • Habitat/support for juvenile and adult fish • Prey production for juvenile salmon (harpacticoid copepods, amphipods) • Detritus sink • Predator protection for sand lance • Wave dissipation for salt marsh and fish <p>Viable Salmon Population (VSP) Parameters:</p> <ol style="list-style-type: none"> 1. <u>Abundance</u>: Supported indirectly as a substrate for food webs that support prey populations. 2. <u>Population growth rate</u>: Supported indirectly as a substrate for food webs that support prey populations. 3. <u>Spatial structure</u>: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. 4. <u>Diversity</u>: Supported indirectly by supporting individuals from a variety of independent Chinook populations assumed to use the East Kitsap nearshore. | <ul style="list-style-type: none"> • Unnatural erosion or deposition of sediment • Overabundance of organic matter loading, including ulvoid mats • Alteration of dendritic tidal channels • Fecal and chemical contamination • Physical disturbances from shoreline armoring, marina construction • Competition from non-native species • Colonization by <i>Spartina</i> sp. • Presence of man-made debris • Physical disturbances from dredging • Filling and diking • Habitat changes affect the biological community—this is the main link to look for. | <p>Federal: Corps Section 404 & Section 10 permits initiate ESA Section 7 Consultations & Essential Fish Habitat Consultations. The Corps’s responsibility includes development activities below the mean, higher-water mark.</p> <p>State: Such areas in Washington with known lingcod or rockfish settlement and nursery areas are considered “saltwater habitats of special concern” and have been given “no net loss” protection in the application of the “Hydraulic Code Rules,” WAC 220–110. Jurisdiction stops at ordinary high-water line.</p> <p>Kitsap County: The County’s The Kitsap County Critical Areas Ordinance (CAO) and Shoreline Management Master Program (SMP) are the primary regulatory tools. Activity in tidal mudflats may require the preparation of a Habitat Management Plan.</p> | <p>Science Gaps:</p> <ul style="list-style-type: none"> • It is unknown whether tidal flats in highly urbanized settings, or where physical processes have been highly disturbed, can be restored. • Can other measures (<i>e.g.</i> beach feeding) be substituted for highly disturbed physical processes when these cannot be restored? <p>Regulatory Gaps:</p> <ul style="list-style-type: none"> • The limited knowledge of cumulative effects limits the ability of regulatory agencies to address these effects. • Regulations manage the shoreline through site-by-site consideration, which does not provide or allow for ecosystem-based management. • County staff is not available to look at cumulative impacts. | <ul style="list-style-type: none"> • Complete an East Kitsap Nearshore Assessment (target Oct. 2007). • Update the County’s Shoreline Master Program (due 2011). • Identify funding (such as applying for SRFB grants) to implement comprehensive monitoring to look at cumulative impacts. | <ul style="list-style-type: none"> • Develop a method of identifying, and develop long-range planning tools to manage, cumulative impacts of shoreline development. • Protect existing mud flats through acquisitions and conservation easements for intertidal areas wherever possible. • Develop incentive programs to encourage the removal of unnecessary shoreline armoring and the use of soft-bank protection. (<i>e.g.</i> Public Benefit Rating System) • Develop incentive programs to encourage community and joint-use docks <i>vs.</i> single-family docks. • Develop education and outreach programs which may include: <ul style="list-style-type: none"> ○ Funding an Education / Outreach position ○ Implementing a shoreline stewardship program ○ Conducting shoreline educational workshops ○ Developing a video on how salmon are using Kitsap and what citizens can do to protect and improve conditions ○ Offer a “Sound Boater” Program to educate recreational boaters on best management practices (BMPs) for boating. • Monitor for <i>Spartina</i> sp. infestation and curtail growth. |