Port Susan
Marine Stewardship Area
Conservation Action Plan
Phase II

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Snohomish County

Snohomish County Marine Resources Committee

Island County Marine Resources Committee

Tulalip Tribes

Sea Grant Washington

Northwest Straits

WSU Beach Watchers

The Nature Conservancy
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List of Acronyms

BMP	Best Management Practice
CAP	Conservation Action Planning
CWD	Clean Water District
EBM	Ecosystem-Based Management
ECO Net	Education, Communication and Outreach Network
LID	Low Impact Development
KEA	Key Ecological Attribute
MRC	Marine Resources Committee
MSA	Marine Stewardship Area
NOAA	National Oceanic and Atmospheric Administration
NWSC	Northwest Straits Commission
NWSF	Northwest Straits Foundation
OFM	Office of Financial Management
PDS	Planning and Development Services
PSP	Puget Sound Partnership
QAPP	Quality Assurance Project Plan
SCD	Snohomish Conservation District
SLS	Sustainable Lands Strategy
SMP	Shoreline Master Program
STAG	Stillaguamish Technical Advisory Group
SWM	Surface Water Management
TNC	The Nature Conservancy
U&As	Usual and Accustomed Areas
UGA	Urban Growth Area
USFWS	United States Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDOE	Washington Department of Ecology
WDOH	Washington Department of Health
WSG	Washington Sea Grant
WSU	Washington State University

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The Nature Conservancy
The Northwest Straits Marine Conservation Initiative
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Ecostudies Institute
Island County
- Marine Resources Committee
- Environmental Health
- Public Health
- Planning and Community Development

Native Habitat Restoration
National Oceanic and Atmospheric Administration
Northwest Straits Marine Conservation Initiative
People For Puget Sound
Puget Sound Partnership
Salish Sea Biological
Snohomish Conservation District
Snohomish County
- Marine Resources Committee
- Planning and Development Services
- Surface Water Management

Stillaguamish Clean Water District
Stillaguamish Watershed Council
Stillaguamish Tribe
Skagit River System Cooperative
Stillaguamish Watershed Council
The Nature Conservancy
Tulalip Tribes
Washington Sea Grant
Washington Department of Ecology
Washington Department of Fish and Wildlife Washington Department of Health
Washington Department of Natural Resources
Washington State University Extension
- Beach Watchers
- Agriculture

Whidbey-Camano Land Trust

Stakeholder Outreach and Feedback Organizations
Christianson Family Farms/ Marine View Farm
Ellingsen Family Farms
Klesik Family Farm
More than150 members of the public participated in four citizen outreach workshops in 2011.
More than 25 members of the public are engaged in a citizen science project to collect data on Port Susan shorelines.

Facilities
Camano Center
City of Everett

North County Fire Hall
Northwest Fisheries Science Center, Mukilteo Research Station
Snohomish County Campus
Stanwood Community and Senior Center
Stillaguamish Casino-Angel of the Winds
Tulalip Administration Building
Warm Beach Camp

Executive Summary

The Port Susan Marine Stewardship Area (MSA) Conservation Action Plan aims to achieve a healthy marine and estuarine ecosystem with thriving biodiversity and strong recreational and resource based industries. Located within Puget Sound between Snohomish and Island Counties, Port Susan is characterized by a diversity of landscapes, including forests, farms, marine shoreline, and the Stillaguamish River delta. Yet, the ecological systems that support these species and industries are threatened. Human activities resulting in habitat loss, degraded water quality, and many other stresses are becoming increasingly prevalent as the human population in Puget Sound grows and expands.

The Port Susan Marine Stewardship Area provides a way for stakeholders to identify key actions that will result in a healthier ecosystem and benefit those who live, work, and recreate there. To accomplish this, a diverse planning group consisting of partners from Island and Snohomish County Marine Resources Committees (MRCs), The Tulalip Tribes, The Stillaguamish Tribe, The Northwest Straits Initiative, The Nature Conservancy, Washington Sea Grant, and Washington State University Extension Beach Watchers formed from 2007-2011. The goal of the Port Susan MSA conservation designation is to generate responsibility within the relevant authorities and encourage stewardship by the users of marine environments for the conservation of natural, cultural, and scenic values. It encourages citizen participation and a common community vision, but designation carries no regulatory authority.

The MSA team used the Nature Conservancy's Conservation Action Planning (CAP) process to guide the project. CAP begins with identification of a set of conservation 'targets,' which comprise a limited suite of species, ecological communities and ecological systems that are chosen to represent and encompass the biodiversity found in the project area. Targets are representative of the system, such that conservation of the targets will ensure the conservation of all native biodiversity within functional landscapes. Target viability, or health, was assessed and threats to target status identified. Threats consist of stresses affecting the targets and the sources of stress. Based on the identification on threats, conservation strategies were developed for each target and ranked based on benefit, cost, and feasibility, to ensure that the most pertinent strategies receive resources.

In parallel to the CAP process, a citizen science project was developed to address knowledge gaps. This project centered on data collection in the Port Susan nearshore by a group of enthusiastic volunteers. As part of the adaptive management process, these data can be used to update the viability assessment and inform actions under many of the strategies.

Through the CAP process and with the help of many partner organizations, stakeholders, managers, and local citizens, more than 30 prioritized strategies are identified in this MSA plan. These strategies were presented to citizens in both Snohomish and Island Counties and vetted by local resource managers and scientists. In December 2011, both Snohomish and Island County MRCs voted to endorse the Port Susan MSA plan and present it to their elected officials.

In 2012, the Port Susan MSA plan entered Phase II of the CAP planning process. During this final planning phase the MSA Team continued to work with partner organizations to develop a Conservation Workplan and Measures Plan. The Workplan identifies partner organizations for each

strategic action and the action steps that needs to happen to meet the conservation goals. Measures were developed for strategic actions to monitor whether progress is being made relative to the plans desired results and the effectiveness of the management action steps. Implementation of the Workplan will ensue and measures used to monitor progress and adapt the plan as necessary. Recognizing that much of this plan is beyond the scope and capacity of individual authorities, the MSA team is relying on the cooperation of partner organizations and the community to implement this plan.

Port Susan Marine Stewardship Area Map

1. Introduction

Port Susan is a picturesque and productive region in Puget Sound, Washington. It is located approximately 40 miles north of Seattle, bordered by Snohomish County to the east, Camano Island (Island County) to the west, and the Tulalip Bay to the south (Figure 1). The Port Susan area encompasses a portion of both the Stillaguamish and Tulalip Tribes' adjudicated Usual and Accustomed Areas (U&As). The City of Stanwood is located on the northeastern side of the bay.

Figure 1. Port Susan MSA, Washington.

Port Susan is located within Whidbey Basin, which is the largest sub-basin of Puget Sound. The diversity of landscapes in Port Susan includes forests, farms, marine nearshore and estuarine ecosystems, and river deltas. The Stillaguamish River drains into Port Susan, creating extensive tidal mudflats that support a wide array of wildlife. The area is ecologically rich with migratory Gray whales, numerous bird species, all five species of Pacific salmon, and productive shellfish beds.

Natural resources are an important component of the economy in Snohomish and Island Counties. Historically, the natural resource economy has been defined by agriculture, forestry, fishing and hunting. Agriculture is Washington State's largest employer, and this holds true in the Stillaguamish delta and throughout Island County. Additionally, fishing for salmon and shellfish remains an important commercial, cultural, and recreational activity in Snohomish County and Camano Island (PSP 2009). Between 2001 and 2009, the number of annual combined freshwater and saltwater fishing licenses issued nearly doubled within Island County, and grew by nearly 30 percent in Snohomish County (Soundwide Starrfish 2010). Tribes have federally-reserved natural resource treaty rights associated with their reservation or Usual and Accustomed Area and rely on the resources of Port Susan for subsistence, cultural, and ceremonial purposes. Forestry continues to be widely practiced in the Stillaguamish basin, with approximately three-quarters of the watershed in forestry land use (SIRC 2005).

Recreational aspects of the natural resources economy such as bird watching, hiking, kayaking, and biking are also prevalent. Recreational revenue is of particular importance in Port Susan due to the diversity of wildlife. The Audubon Society designated it as an "Important Bird Area," one of only four sites in Puget Sound that regularly supports more than 20,000 shorebirds in a season, which draws many birders to the area (National Audubon Society 2010). In addition, The Nature Conservancy (TNC) maintains a large presence in Port Susan, as owner of the 4,122-acre Port Susan Bay Preserve, which encompasses much of the Stillaguamish River estuary, including 166 acres of artificially diked uplands. The Preserve represents many of the habitat features that draw wildlife to the area.

Despite the incredible value of the resources in Port Susan, ecosystem status is in decline (SIRC 2005). Snohomish County is the 3rd most populated county in the state, and Island County is 14th,

with substantial population growth forecast in both counties over the coming years (OFM 2010). Puget Sound Chinook salmon and steelhead populations, which depend upon the Stillaguamish and Snohomish Rivers, are listed as threatened under the Federal Endangered Species Act. The Port Susan shellfish growing area status was downgraded in 1987 due to high fecal coliform levels, resulting in the restriction and eventual closure of commercial and recreational shellfish harvest in specific areas, though some areas were reopened in 2010 due to water quality improvements (Snohomish County Surface Water Mgmt 2009, Edwards et al. 2011). Stakeholder perceptions identify anecdotal declines in the Bay, identifying habitat loss, increased development, loss of marine resources, declining water quality, and increased sedimentation as trends they have observed (NWSF 2008).

In 2004, The Nature Conservancy conducted an assessment of the Willamette Valley–Puget Trough–Georgia Basin Ecoregion; an area that extends from Campbell River, British Columbia in the north, to Eugene, Oregon in the south (Floberg et al. 2004) (See Appendix A). This assessment identified Port Susan as a Priority Conservation Area. Priority Conservation Areas are areas of biodiversity concentration that contain target species, communities, and ecological systems that are of exceptional biological value and are the most likely places for conservation to succeed based on their current condition, land use, and other factors (Floberg et al. 2004). The assessment also identified and ranked 13 human actions that pose a threat to the Port Susan marine ecosystem, eight of which they identified with high urgency, meaning they are currently present or likely within the next four years (Floberg et al. 2004 Appendix 21A). In order of importance, these impacts are: overfishing, overhunting, over collecting; unknown source of water pollution; channelization of rivers or streams; crop production practices; ditches, dikes, drainages, and diversions; aquaculture; invasive species; industrial discharge; recreational use; roads and/or utilities; residential development; collateral damage from fishing; and poaching or commercial collecting (Floberg et al. 2004).

> The Nature Conservancy recognized Port Susan as a *"Priority Conservation Area"* by using metrics for consideration of regional importance, habitat diversity, nearshore marine fish, seabirds, marine mammals and invertebrates, as well as integration with terrestrial features *(Floberg et al. 2004, Appendix A).*

Many entities hold regulatory authority in Port Susan, resulting in a complex regulatory landscape. These include Tribal, Federal, State, and local authorities. Tribal and State authorities co-manage fish and wildlife resources (The Stillaguamish Tribe, The Tulalip Tribes, and the Washington Department of Fish and Wildlife). Federal authorities manage fish and wildlife resources and critical habitat under the Endangered Species Act and other Federal statutes (NOAA, USFWS). State authorities regulate water quality (Department of Ecology) and monitor shellfish growing areas for safe consumption (Department of Health). Regional groups plan for upland watersheds and salmon recovery (Water Resource Inventory Areas). Local and Tribal authorities govern land use regulations affecting shoreline and upland areas (City of Stanwood, Snohomish and Island Counties, Tulalip Tribes, and Stillaguamish Tribe). There is also a complex landscape of ownership in Port Susan, with private landowners playing a major role. For instance, Triangle Cove, a 225-acre pocket estuary on Camano Island, is almost entirely owned by one individual. Additionally, The Nature Conservancy and Whidbey Camano Land Trust own several thousand acres of prime fish and waterfowl habitat at the head of the bay.

Finally, the Washington State Parks Department and Snohomish and Island counties own and manage several shoreline parks.

Figure 2. Island County Marine Stewardship Areas. Red circle roughly indicates Port Susan MSA project area, including area outside of Island County jurisdiction.

In 2003, Island County designated its section of Port Susan as a part of the Saratoga Passage Marine Stewardship Area[1] (Figure 2), recognizing that

"the waters of Island County provide one of the richest marine habitats and most scenic vistas in the U.S., and need to be identified, recognized and preserved."

A Marine Stewardship Area (MSA) is a conservation strategy that works to generate responsibility within relevant authorities and users of marine environments for the conservation of natural, cultural, and scenic values. Marine Stewardship Areas are a place-based approach to protecting the marine environment. They aim to improve planning, monitoring, decision-making, education, and voluntary compliance with best management practices; rather than creating new regulations or restrictions. However, since Island County's waters represent only half of Port Susan, the Saratoga Passage Marine Stewardship Area is not a whole management strategy for Port Susan.

Due to overlapping jurisdictions, disconnected management, the identification of biodiversity importance, and concern over environmental decline, in 2006 an effort by the Northwest Straits Foundation (NWSF) emerged to develop a Marine Stewardship Area in Port Susan based on ecological connections and community considerations. This undertaking began to

"initiate ecosystem-based management for the marine resources of Port Susan through a Conservation Action Planning process involving tribes, local governments, agencies, tideland and upland land owners, and other relevant organizations" (NWSF 2006).

The effort was modeled after a previous project in San Juan County, also initiated by the San Juan County Marine Resources Committee, to establish a Marine Stewardship Area in the San Juan Islands using TNC's Conservation Action Planning (CAP) process (Evans and Kennedy 2007). From the NWSF's initiation of ecosystem based management in Port Susan, grew a collaborative effort consisting of representatives from: Snohomish County Marine Resources Committee (MRC), Island County Marine Resources Committee, Northwest Straits Commission and Foundation, Tulalip Tribes, Stillaguamish Tribe, Washington Sea Grant, Washington State University Extension Beach Watchers, The Nature Conservancy, Snohomish County Surface Water Management, Shore Stewards, and Puget Sound Partnership.

[1] Island County Resolution C-126-03; 22 Dec, 2003

Guiding Principles for the Port Susan MSA

1. Improve stewardship of Port Susan through education, research, monitoring, and voluntary protection measures rather than new regulation.
2. Use both indigenous knowledge and the results of scientific research to select protection/conservation/restoration targets and inform adaptive management.
3. Encourage all participants to be open to others' perspectives concerning the marine environment so that all will be encouraged to participate in developing protection/recovery plans.
4. Recognize opportunities that come through collaboration and improve communication about Port Susan resource issues both within the community and beyond. Designation of a Port Susan Marine Stewardship Area will allow the community to speak with a single voice on the health of Port Susan.
5. Lay the groundwork for strong leadership and new sources of outside funding for Port Susan through creation of a community-based conservation action plan for the Port Susan Marine Stewardship Area.
6. Recognize the abundant knowledge that exists within the Port Susan Community and use this knowledge to advance stewardship area goals.

Marine Stewardship Areas are fundamentally community-based. Garnering diverse input from stakeholders, concerned citizens, and technical experts is essential to ensure a MSA addresses the right issues, fills in current gaps in management and responds to community concerns. Prior to finalizing a vision statement and subsequent goals for a Port Susan MSA, in 2008 the NWSF conducted targeted stakeholder interviews to determine perceptions of Port Susan and include the community in the development of a MSA. This process kicked off by interviewing people across sectors, including residents, land and resource managers, local business owners, state and local government officials, a tribal elder, representatives from conservation groups, a public access/hunting advocate, and a farmer (NWSF 2008). Some of the major concerns expressed about Port Susan were habitat loss, increased development, loss of marine resources, declining water quality and increased sedimentation (NWSF 2008). These diverse perceptions helped focus MSA development.

Snohomish County is currently working to put forth a resolution to designate Port Susan as a Marine Stewardship Area. The Tulalip Tribes and Stillaguamish Tribe have approved the creation of a Port Susan Marine Stewardship Area, and Island County waters are currently recognized as a Marine Stewardship Area. In December 2011, both Snohomish and Island County MRCs voted unanimously (with one abstention) to endorse the Port Susan MSA plan. The motion is worded as such:

> <u>Snohomish – Island MRC Joint Resolution</u>
> "Motion carried. Motion by Toft, second by Haynes, carried unanimously by both MRCs, with Homola abstaining as an ex-officio, non-voting member of Island MRC. The Island and Snohomish MRCs support and recommend county leaders accept the Port Susan Marine Stewardship Area draft plan as outlined. Friendly amendment by Masters, accepted by Toft and Haynes, adding that Snohomish MRC joins in this support and recommendation" (Island County MRC Meeting Minutes Dec. 6, 2011).

2. Planning Process

2.1 Conservation Action Planning

Figure 3. The CAP Process (TNC 2007).

The development of the Port Susan MSA is following TNC's Conservation Action Planning process, a "collaborative, science-based approach used to identify the biodiversity that needs to be conserved, to decide where and how to conserve it and to measure effectiveness" (TNC 2007). Conservation Action Planning has been used throughout the world to coordinate ecosystem-based management. It is a favored approach in the Puget Sound region having been used previously by San Juan County, and by the Puget Sound Partnership (in its greater form, Open Standards for the Practice of Conservation). Use of CAP in the region may be due to the precedent set by TNC's Ecoregional Assessment, which ranks areas of conservation importance (such as Port Susan), while CAP focuses on developing and implementing strategies to address priorities, achieve the goals, and measure results.

Conservation Action Planning is an iterative process, consisting of four main planning themes: defining the project, developing strategies and measures, implementing strategies and measures, and using results to adapt and improve (Figure 3). To date, the Port Susan MSA has worked through CAP to define the project and develop strategies and measures (the details of which are presented below). As such, CAP provides a backbone not only for designation of the Port Susan MSA, but also for future conservation implementation and monitoring efforts in the region.

2.2 Project Team

The Port Susan MSA project team decided to break into several organizational groups to facilitate a coordinated project. These organizational groups are shown in the diagram below (Figure 5). At the center of the collaborative planning effort a Core Team was convened, responsible for managing the project. It consisted of representatives from: Snohomish MRC, Island MRC, and Tulalip Tribes. A broader Advisory Team was also convened to guide the process, with representatives over the project timeframe from Snohomish MRC, Island MRC, Tulalip Tribes, Stillaguamish Tribe, the Snohomish Conservation District, The Nature Conservancy, The Northwest Straits Commission, Island County Shore Stewards, WSU Snohomish County Extension Beach Watchers, and Washington Sea Grant. These two teams met monthly. Additionally, the consulting firm Native Habitat


Figure 4. Port Susan MSA Strategies Workshop Participants, March 2011.

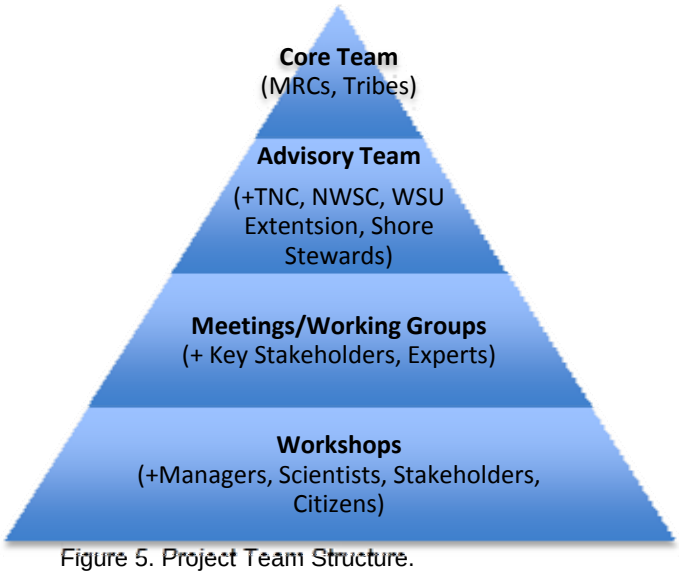


Figure 5. Project Team Structure.

Restoration, of Stockbridge Massachusetts, provided facilitation on the CAP process throughout the project. The greater community of experts, managers, citizens, and stakeholders was engaged through working groups and in a series of workshops designed to gather and assimilate information and develop conservation strategies (See Appendix F for a detailed list of meetings).

3. Conservation Planning Methods and Results

3.1 Conservation Target Selection and Viability

Conservation targets provide the basis for setting goals, carrying out conservation actions, and measuring conservation effectiveness. CAP calls for the identification of focal conservation targets that, in theory, will ensure the conservation of all native biodiversity within functional landscapes. Therefore, focal conservation targets comprise a limited suite of species, ecological communities, and ecological systems that are chosen to represent and encompass the biodiversity found in the project area.

Focal targets for Port Susan were largely developed during a science workshop held in January 2010. The workshop convened a dynamic group of scientists representing diverse disciplines, including but not limited to, fisheries, geology, ecology, hydrology, and oceanography. The origin of scientists was also diverse; scientists came from public agencies (WDFW, WDOE), Tribes (Tulalip, Stillaguamish), academia (WWU, UW), NGOs (WA Audubon), and consulting firms (Coastal Geologic Services). Scientists with local knowledge of Port Susan were especially important to this effort. See pages ii and iii for a list of participating scientists. The goal of the science workshop was to identify conservation targets that span a range of biodiversity, biological organization (species-community-system), and spatial scales in Port Susan.

Seven ecosystem targets were selected for Port Susan. While targets were largely chosen during the science workshop, they were refined through formal and informal consultation with scientific and technical experts following the workshop. The ecosystem targets for Port Susan are:

- Beaches
- Chinook Salmon
- Crustaceans
- Embedded Invertebrates[2]
- Forage Fish
- River Delta
- Shorebirds

After identifying focal conservation targets to represent the overall biodiversity and status of the ecosystem, metrics were developed to assess the current status of the system, define specific goals, and measure progress towards these goals. According to the CAP process this is called a viability assessment. Viability is defined as the status or "health" of the target and indicates its ability to withstand or recover from most disturbances and persist over time. To perform a viability assessment key ecological attributes (KEAs) and indicators were identified for each target to assess its status. Viability ratings fall into the following categories:

[2] Originally called bivalves and defined by the native littleneck clam, after further consultation with experts, this target was refined to be more inclusive of mudflat invertebrates performing similar ecosystem functions.

Very Good - Ecologically desirable status; requires little intervention for maintenance.
Good - Indicator within acceptable range of variation; some intervention required for maintenance.
Fair - Outside acceptable range of variation; requires human intervention.
Poor - Restoration increasingly difficult; may result in extirpation of target.

Viability measures for each KEA were combined to yield the status of the target[3]. Target status was then combined to yield a viability raking for the whole system. The overall viability ranking for Port Susan is fair. A summary of viability for Port Susan targets can be seen in Table 1 (for a full description of viability rankings including KEAs and indicators, see Appendix B).

In parallel to the Port Susan MSA planning process, a citizen science project was developed to address gaps in knowledge in the viability assessment. The citizen science project focused on the Chinook salmon, forage fish, and beaches targets and included data collection on shoreline armoring, marine riparian canopy, and adjacent land use (for more information on the citizen science project, see Appendix I).

Table 1. Target Viability Rankings. Individual KEAs for Embedded Invertebrates were not yet ranked due to limited expert input at time of publication.

	Conservation Targets	Landscape Context	Condition	Size	Viability Rank
1	Shorebirds	-	-	Good	**Good**
2	Chinook Salmon	Poor	Fair	Fair	**Fair**
3	Forage Fish	Good	Good	Good	**Good**
4	Embedded Invertebrates	-	-	-	**Good**
5	Dungeness Crab	-	Good	Good	**Good**
6	River Delta	Poor	Poor	Poor	**Poor**
7	Beaches	Fair	Poor	Good	**Fair**
	Project Biodiversity Health Rank				**Fair**

[3] Viability measures (and later on threats) were entered and combined using the CAP Workbook, an open source tool developed by TNC. It is a simple, customized Excel tool, which lends itself to easy entry of information and modification. The Workbook contains spreadsheets in which to record KEA, indicators, rankings and rationale determined during the viability assessment process. It also contains formulas that roll up the rankings, yielding and overall ranking for each target and the system as a whole, as in Table 1.

Short descriptions of the conservation targets and the rationale for their selection follow. For each target, viability rank is indicated and the KEAs and indicators developed to assess them are listed (for a full description of viability ranking, see Appendix B). These targets were selected to encompass the range of species and system diversity within the Port Susan MSA project area. In this way, these seven targets serve as a way to assess the overall biodiversity and status of the system.

3.1.1 Shorebirds – Good Viability Ranking

Port Susan is one of only four sites in Puget Sound that regularly support more than 20,000 shorebirds in a season, and has been designated by the Audubon Society as an "Important Bird Area" (Audubon 2010). Three species that frequent Port Susan emerged from the workshop to make up this ecological community target: dunlin (*Calidris alpina*), western sandpipers (*Calidris mauri*), and least sandpipers (*Calidris minutilla*). While none of these species breed in Port Susan, shorebird abundance (including western and least sandpipers) and diversity is highest during their fall migration (August – October) (Slater 2004). Dunlins are largely present in the winter, during their non-breeding period (October-April), when they make up more than 90 percent of the estuarine shorebird community (Buchannan 2006). Additionally, Slater (2004) found that shorebirds in Port Susan responded dynamically to tidal cycles, using the TNC upland site at high tides and shifting to marsh and intertidal habitats at intermediate and low tides.

Key Ecosystem Attributes and Indicators

- Condition
  - Abundance of food resources
    - Density of invertebrates in mudflats and water column
  - Community architecture
    - Abundance of large woody debris (LWD) for roosting
    - Area of winter forage habitat (mudflat, marsh and agricultural fields)
- Size
  - Population size and dynamics
    - Number of dunlins/year

3.1.2 Chinook Salmon – Fair Viability Ranking

An iconic species in the Northwest, Puget Sound Chinook salmon (*Oncorhynchus tshawytscha)* were designated as an Evolutionarily Significant Unit under the Endangered Species Act and listed as threatened in 1999; in 2005 this threatened status was reaffirmed (NMFS 2011). This designation includes twenty-two naturally spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound, including two populations from the Stillaguamish watershed in the Port Susan MSA project area: North Fork summer Chinook and South Fork fall Chinook, both of which are genetically distinct from other Puget Sound stocks (WA Conservation Commission 1999). Juvenile Chinook rear throughout the river system. Fry spend from one to five months in freshwater before migrating to the estuary. Outmigration for both populations occurs from mid-March through June (WA Conservation Commission 1999). Thus, for Port Susan, this species target includes juvenile Chinook salmon that migrate from the upper watershed through estuary towards the open ocean, and adult Chinook that pass through the

MSA en route to their natal streams. Chinook management is a focus of many of the partners in the project area, such as WDFW, NOAA, Tulalip Tribes, and the Stillaguamish Tribe. Yet, while many resources from many entities have been dedicated to salmon recovery, they remain threatened. Thus, for a collaborative effort like the Port Susan MSA, Chinook are an apt species for fostering co-management.

Key Ecosystem Attributes and Indicators

- Landscape Context
    - Connectivity among communities and ecosystems
        - Percent of non-armored shoreline
    - Landscape pattern (mosaic) and structure
        - Percent of historic intertidal marsh habitat
- Condition
    - Community architecture
        - Arrival of juveniles to the nearshore
    - Population structure and recruitment
        - Juvenile density
        - Juvenile growth

3.1.3 Forage Fish – Good Viability Ranking

Forage fishes are loosely defined as small schooling fishes that form critical links between the marine zooplankton community and larger predatory fish and wildlife in a marine food web (Penttila 2007). The species that make up this ecological community target are: Pacific herring (*Clupea pallasi*), surf smelt (*Hypomesus pretiosus),* and Pacific sand lance (*Ammodytes hexapterus)*. In Port Susan, many of the intertidal and shallow subtidal areas constitute spawning habitat for these species. Nearshore ecosystems also provide important nursery and feeding grounds for these species during their first year of life (Penttila 2007). In addition, forage fishes are a focus of the Northwest Straits Initiative and the MRCs, as one of their benchmark goals is rebuilding forage fish populations (Northwest Straits Initiative 2010a).

Key Ecosystem Attributes and Indicators

- Landscape Context
    - Soil/sediment stability and movement
        - Functioning feeder bluff
    - Water/soil temperature
        - Marine riparian shade
- Condition
    - Community architecture
        - Native eelgrass and alga *Gracilariopsis* area
- Size
    - Population size and dynamics
        - Herring spawning biomass

3.1.4 Embedded Invertebrates – Good Viability Ranking [4]

This ecological community target is a species assemblage of the Eastern soft shell clam (*Mya arenaria*) and sand shrimp (*Neotrypaea californiensis*). These species are grouped because they function in the intertidal and shallow subtidal habitat as filter-feeders and bio-turbulators that consume both algae and detritus, control local organic matter, and are best characterized as non-mobile macro-invertebrates. Additionally, these species perform important ecological functions in Port Susan, such as maintaining water quality through filtration and sequestering nitrogen. The non-native purple varnish clam (*Nuttallia obscurata*) also performs these functions in Port Susan and adds biomass to the system; however, it has taken residence in the Port Susan ecosystem for less than 15 years. Additionally, there is some divergence of opinion within the scientific community on the ecological function of the varnish clam and its effects (detrimental or not) on native species and habitats. Therefore we include the varnish clam here as a nested target to be monitored in the future as there is potential for it to become a threat. Due to the relatively unstudied nature of the varnish clam and the novelty of its establishment in the system, it will be treated differently than the other species in this ecological community target. It will not be used in developing viability or assessing threats. Rather, varnish clams are included in recognition of their persistence in the system, and the need to gather additional information on their ecological function and niche.

Key Ecosystem Attributes (KEA) and Indicators

- Landscape Context
  - Estuarine habitat spatial extent and connectivity
    - Spatial distribution of Eastern soft shell clams in suitable habitat
    - Spatial distribution of sand shrimp in suitable habitat
- Condition
  - Population structure and recruitment
    - Relative frequency of size classes of Eastern soft shell clams
- Size
  - Population size and dynamics
    - Density/Abundance of Eastern soft shells per unit area (current sampled clam beds, not the entire mudflat)
    - Sand Shrimp biomass per unit area

3.1.5 Dungeness Crab – Good Viability Ranking

This target is defined by a single species, Dungeness crab (*Cancer magister*). Dungeness crab is included as a priority species in WDFW's Priority Habitats and Species List. They are an important resource for recreational, commercial and tribal harvests, and are co-managed by WDFW and the Tribes. Dungeness crab serve as a critical component in the food web and are a vital food source for many species. Many predators of Dungeness are important commercial and recreational species, and some are also listed as endangered or threatened by the

[4] Note that the process for this target differed from the others as there was some disagreement over target definition, and a more lengthy process was required to describe it. The Embedded Invertebrates target was assigned a good viability ranking overall. Less input from experts left the viability of the individual KEAs currently unspecified. Viability will be re-examined in the future, upon further consultation with experts.

federal government and Washington State (Fisher and Velasquez 2008). Dungeness management has also been a priority of the Northwest Straits and the Stillaguamish Tribe through their derelict fishing gear removal programs. Established in 2002, to date the Northwest Straits program has removed 4,081 nets and 2,688 derelict pots throughout Puget Sound (Northwest Straits Initiative 2011). In Port Susan the Stillaguamish Tribe has investigated, removed, or deactivated approximately 600 derelict crab pots.

Key Ecosystem Attributes and Indicators

- Condition
    - Community architecture
        - Total area of preferred juvenile habitat
    - Population structure and recruitment
        - Settlement on beach
- Size
    - Population size and dynamics
        - Total landings of legal sized male crabs

3.1.6 River Delta – Poor Viability Ranking

The Stillaguamish River delta serves as a key ecological system in Port Susan. This target represents the habitat itself as well as the physical processes that shape it. The habitats of the delta are important to several other targets, such as shorebirds, Chinook, and embedded invertebrates. In this way, these species are nested under the delta target. In 2005, the Stillaguamish Tribe characterized nearshore/delta habitat in Port Susan and identified un-vegetated fine sediments (~75%), salt marsh (~12%), and eelgrass (~9.5%) as the dominant habitat types in the Stillaguamish Delta in Port Susan (Griffith, 2005).

Key Ecosystem Attributes and Indicators

- Landscape Context
    - Hydrologic regime (timing, duration, frequency, extent)
        - Stillaguamish River hydrologic regime
    - Landscape pattern (mosaic) and structure
        - Number of distributary channels per unit area
- Condition
    - Biological legacies
        - Number of pieces of large woody debris per unit area
    - Community architecture
        - Area of delta habitats (scrub, shrub, tidal wetlands, mudflats)
- Size
    - Size/extent of characteristic communities/ecosystems
        - Tidal inundation area

3.1.7 Beaches – Fair Viability Ranking

Beaches were identified as an ecological system target in Port Susan because of their importance in maintaining the health of the shoreline. The structure and composition of beaches form a habitat base for many other species and processes. Beaches are instrumental in providing forage fish spawning areas and maintaining sediment deposition from functioning feeder bluffs. The native littleneck clam is included under the beaches target, as a nested target. This allows the native littleneck to be part of the Port Susan MSA plan, as it is a species of concern and recreational importance. The beaches target is an appropriate location for the native littleneck because of the connections between shoreline health and the status of native littleneck beds in the mudflats. Additionally, several of the strategies for beaches may also improve the health of native littleneck populations.

Key Ecosystem Attributes and Indicators

- Landscape Context
    - Connectivity among communities and ecosystems
        - Percent of historic tidally accessible area within pocket estuaries, subject to tidal inundation
        - Length of non-armored beach
    - Soil/sediment stability and movement
        - Percent of drift cell length that is fully functional
    - Water/soil temperature
        - Marine riparian shade
- Condition
    - Community Architecture
        - Number of pocket estuaries
    - Species composition/dominance
        - Percent of historic tidally accessible area within pocket estuaries, subject to tidal inundation
- Size
    - Size/extent of characteristic communities/ecosystems
        - Percent of feeder bluff length that delivers sediment to the marine environment

3.3 Threats

After determining ecosystem targets and status, the next step in the CAP process is to identify threats to the targets in order to prioritize conservation actions. This occurred via a workshop convening local scientists and managers as well as a series of follow-up meetings of the Core and Advisory Teams. In October 2010, more than 30 resource managers representing 20 organizations gathered to discuss the threats to the Port Susan ecosystem. Threats were identified through a collaborative process to identify stresses and sources of stress to the targets. Stresses are impaired aspects of conservation targets that result directly or indirectly from human activities. Sources are the proximate activities or processes that directly cause stresses and thus the destruction, degradation and/or impairment of focal conservation targets. Once stresses and

sources of stress are identified, threats are ranked to identify the most critical threats so that attention can be directed at them. This process enables the top threats to be identified for individual targets, as well as the Port Susan ecosystem as a whole[5].

The top five critical threats that were identified across targets are bank hardening, levee maintenance, agricultural runoff, loss of vegetated buffer and increased flooding. This information was used when designing conservation strategies. Threat definitions are listed below and a full listing of threats and corresponding ratings by target and ecosystem is provided in Table 2.

Threat Definitions:[6]

- *Bank Hardening* – includes any form of hardening/shoreline armoring (e.g. bulkheads, rip rap, etc.) and development along the nearshore or Stillaguamish delta.
- *Levee Maintenance* – building or upkeep of levees, including vegetation removal, along the Port Susan/Stillaguamish shoreline.
- *Agricultural Runoff* – runoff originating from agricultural sources that adversely affects water quality, marine organisms, and hydrology by containing contaminants (e.g. metals, pesticides and polyaromatic hydrocarbons), altering water temperature, increasing sedimentation and/or changing flow patterns.
- *Loss of vegetated buffer* – loss of vegetation along marine shoreline freshwater streams and rivers.
- *Increased Flooding* – changes in water regime due to climate change and stormwater runoff from commercial and residential development, which alters hydrology.
- *Acidification* – altered water chemistry due to climate change, specifically decreasing pH caused by the uptake of anthropogenic carbon dioxide from the atmosphere.
- *Spills* – catastrophic and/or significant oil spills (i.e. a low probability, high impact event) occurring within the Port Susan MSA or close enough to the MSA that wind and/or currents distribute the oil over a significant portion of the MSA. A specific size of vessel or volume of oil spilled was not designated.
- *Derelict Gear* – includes both lost crab pots and fishing nets in Port Susan.
- *Illegal Harvest* – harvest outside of regulations for all species.
- *Increased Storm Events* – due to climate change leading to beach disturbance and nearshore habitat loss.
- *Incompatible Recreation* – recreational practices that could leave environmental footprints and/or disturb wildlife, such as hunting debris, dogs on beaches, and kayaking.
- *Invasive Species* – non-native species that have established populations (or may become established) in Port Susan, such as *Spartina spp*., *Zostera japonica*, the purple varnish clam (*Nuttallia obscurata*), and the zebra mussel (*Dreissena polymorpha*).
- *Incompatible Harvest* – unsustainable harvest for all species.
- *Municipal Discharge* – point source pollution from the wastewater treatment plants.

[5] This was done using the CAP workbook (see footnote three for detail).

[6] Recent changes to the threats definitions have been made to better clarify development and stormwater runoff within the context of the threats and embed them within more specific threats. These changes are reflected above.

- *Docks and Piers* – overwater structures affecting both eelgrass via shading and disrupting habitat connectivity and nearshore drift.
- *Incompatible Forest Practices* – such as loss of vegetative buffer, increased chronic sediment sources, and altered hydrology.
- *Pollution from Stormwater* – degraded water quality as a result of runoff from the built environment.
- *Septic Failure* – residential septic systems that are not functioning properly and result in discharge/leakage into nearshore environments.
- *Tide Gates* – flood control structures located at the mouths of streams/entrance to estuary, which close during incoming tides to prevent tidal waters from moving upland, and open during outgoing tides to allow waters to drain out. Tide gates may block passage of salmon and other fish.
- *Water Withdrawal* – the drawing down of water from either groundwater or surface water sources for residential, commercial and agricultural use.
- *Removal of Natural Wood* – removal of large woody debris in Port Susan project area and contributing upstream area.
- *Urban Pests* – such as domestic pets like dogs and cats, which disturb wildlife.

Table 2. Threats to Port Susan Ecosystem Targets.

	Threats Across Targets	Shore Birds	Chinook Salmon	Forage Fish	Embedded Invertebrates	Dungeness Crab	River Delta	Beaches	Overall Threat Rank
	Project-specific threats	1	2	3	4	5	6	7	
1	Bank Hardening	Medium	Very High	High		Medium		Very High	Very High
2	Levee Maintenance		Very High	Low			High		High
3	Agriculture Runoff	Medium	Very High				Medium		High
4	Loss of Vegetated Buffer	Medium		High		Medium	High		High
5	Increased Flooding (due to Climate Change and Dev.)	High					High		High
6	Acidification				Medium	High			Medium
7	Spills	High					Medium		Medium
8	Derelict Gear					High			Medium
9	Illegal Harvest					High			Medium
10	Increased Storm Events (due to Climate Change)							High	Medium
11	Incompatible Recreation	Medium				Medium		Medium	Medium
12	Invasives				Medium		Medium	Medium	Medium
13	Incompatible Harvest	Medium			Low	Medium			Medium
14	Municipal Discharge	Medium				Low	Medium		Medium
15	Docks and Piers (Overwater Structures)		Medium					Medium	Medium
16	Incompatible Forest Practices			Medium					Low
17	Pollution from Stormwater		Medium						Low
18	Septic Failure	Medium							Low
19	Tidal Gates		Medium						Low
20	Water Withdrawal						Medium		Low
21	Removal of Natural Wood	Low							Low
22	Urban Pests	Low							Low
	Threat Status for Targets	High	Very High	High	Medium	High	High	High	Very High

3.4 Situation Analysis

Once the stresses and sources of stress to conservation targets were identified, and threats clearly defined, a situation analysis was conducted to further explore the factors that contribute to threats. This step carries the process forward by linking concepts together visually through situation analysis diagrams (Figure 6). Components of a situation analysis include:

- *Targets* – The biological entities (species, communities, or ecosystems) that the project is trying to conserve.
- *Stresses* – Impaired aspects of conservation targets that result directly or indirectly from human activities.
- *Sources of Stress (Direct Threats)* – The proximate anthropogenic activities or processes that have caused, are causing or may cause the destruction, degradation and/or impairment of biodiversity and natural processes.
- *Contributing Factors* – Factors, usually social, economic, political, institutional, or cultural in nature that enable or otherwise contribute to the occurrence and/or persistence of direct threats. These may be either:
    - *Indirect Threats*, which can negatively affect the target, or
    - *Opportunities*, which can positively affect the target and may demonstrate avenues for strategy development.

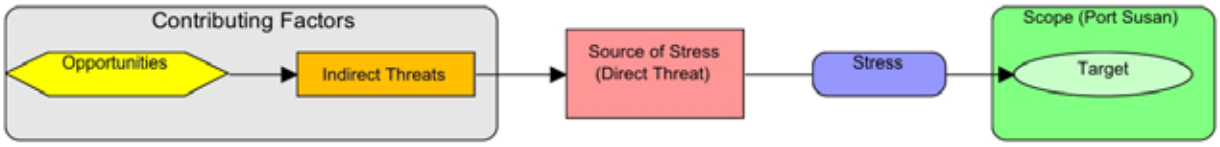


Figure 6. Overview of a situation analysis.

Situation analysis contributed to a broader understanding of the Port Susan social-ecological system. By moving beyond targets and threats, a common understanding of context was created, including both the biological environment and the social, economic, political, and institutional systems that affect the targets. In this way, situation analysis can ultimately assist in strategy development: profiling the project situation as it stands today and providing a starting point to plan for tomorrow.

Situation diagrams were constructed for a selected threat for each target during the October workshop and in follow-up meetings with the Advisory Team. These identified the underlying socioeconomic and cultural factors that contribute to the source and ultimately the stress on the ecosystem targets. Through this exercise, by focusing on the bigger picture, the participants in the workshop helped lay the groundwork for developing conservation strategies in the future. Port Susan situation diagrams can be found in Appendix C.

Figure 7. Building a situation diagram, with the help of a skilled facilitator.

3.5 Conservation Strategies

The development of conservation strategies to guide future actions in Port Susan was the culmination of the first phase of Port Susan MSA planning. Developing conservation strategies involves deciding how to overcome critical threats and restore degraded targets, including what specific objectives need to be achieved and what specific actions need to be taken to achieve those objectives (TNC 2007). Thus, a conservation strategy is a broad course of action that consists of three tiered parts:

1. An objective, which is a specific statement detailing the desired accomplishments or outcomes.
2. Strategic actions, which are the interventions designed to reach the project's objectives.
3. Action steps, which are smaller, preliminary steps taken to accomplish the strategic action.

In order to ensure the strongest conservation strategies possible, objectives should follow the mnemonic, **SMART**, which stands for specific, measurable, achievable, relevant and time-limited. The strategic actions are to be linked, focused, feasible, and appropriate.

Initial work on conservation strategies occurred through an intensive two-day workshop, which convened more than 30 resource managers representing 19 organizations in March 2011. This group built on the work of the two previous CAP workshops (which identified ecosystem targets and threats to these targets). Two objectives and two or three strategic actions were developed for each target[7]. Specific threats were assigned to breakout groups to ensure that abatement strategies were developed for the top threats. The Beaches and Forage Fish targets were combined in the strategies section of the CAP plan as the activities that would improve the health or abate a threat to either beaches or forage fish are closely intertwined. In total, 27 strategic actions were developed during the workshop. Additional strategies have been added at the request of various resource managers working on Port Susan conservation. Objectives and strategic actions were developed though a collaborative process, drawing on existing regional plans and stressing creative thinking to develop new avenues for action.

Strategy Prioritization

After developing strategic actions for the ecosystem targets, workshop participants ranked the actions according to benefits, feasibility, and cost, which resulted in an overall opportunity ranking for each action. Strategies were further categorized as having multiple benefits to multiple targets, being target specific, and needing additional clarifying work.

Two public outreach workshops were held in Snohomish and Island Counties in July 2011 to present conservation strategies to the public and generate feedback; in total, 46 members of the public and ten project team members attended these sessions. Attendees participated in a series of breakout groups by target, facilitated by project team members, where they could provide feedback on importance of the strategies and the level of community support, as well as

[7] Due to a lack of attendance from experts, embedded invertebrates were addressed separately in a subsequent working group.

contribute new strategies, if they felt it necessary. Suggestions from the public were incorporated into the final version of the strategies (Appendix H).

Figure 8. Facilitator working with members of the public at Citizen workshop on Camano Island, July 2011.

Following these workshops, the Core Team reviewed the objectives and strategic actions to clarify and strengthen them. Workshop information was used to link new and existing conservation strategies together by working with local and regional groups. The Advisory Team and additional resource managers who had participated in the workshops then vetted this document (Appendix G). This process resulted in the development of additional strategic actions, and the final strategies consist of 15 objectives and 37 strategic actions.

Objectives and strategic actions are listed below by target.

3.5.1. River Delta

Objective 1. Increase delta complexity of approximately 200 (+/-) acres between South Pass and Hat Slough and improve flood conveyance by creating a restoration project that increases freshwater inputs to the mudflats by 2020.

Strategic Actions

1. Develop agreements and incentives for landowners to redistribute flood water into new distributary channels on their land by 2015.
    a. Opportunity Rank: High

2. Design and build appropriate (historic) distributary channels to convey flood water to 200(+/-) acres of mudflat by 2020.
    a. Opportunity Rank: High

3. Work with the Snohomish Conservation District and WSU Snohomish County Extension Agriculture Educators to improve BMPs in new and existing channel drainage areas to meet all DOE water quality regulations by 2020.
    a. Opportunity Rank: High

Objective 2. Reduce the delivery of flood water to the whole delta area[8] to accommodate more productive agriculture that allows farmers to return a portion of their land to natural functioning

[8] Whole delta area refers to the entire delta area, which includes agriculture.

conditions (either buffer or marsh). Goals for marsh and buffers are consistent with salmon recovery plan of restoring a minimum of 315 acres of estuarine area by 2016[9].

Strategic Actions

1. City of Stanwood and Snohomish County solidify wetland protection, connection, and restoration components as part of stormwater retrofits in Comprehensive Plans by 2015, to create increased water storage in agricultural fields and decrease runoff.
    a. Opportunity Rank: High

2. Retrofit Stanwood developments with low impact development (LID) techniques by 2020.
    a. Opportunity Rank: Medium

Objective 3. Work with farmers, researchers and marketers to develop profitable and environmentally sustainable opportunities to farm under the changing conditions in the Stillaguamish Delta.

Strategic Actions

1. Farm Link connects Snohomish Farm Incubator (farm hands-on training center, including classes on regulations and ecosystem process) graduates with Stillaguamish properties to encourage incoming farmers to promote stewardship and environmentally friendly productivity techniques.

2. WSU Snohomish County Extension Agriculture and Snohomish Conservation District conduct outreach to teach environmental stewardship and productivity techniques for farmers to respond to growing demand for local food produced with good environmental stewardship techniques (and increase profitability by 10-20% overall).
    a. Opportunity Rank: Medium

3. Promote local sustainable seafood harvesting options for salmon, clams and crustaceans.
    a. Opportunity Rank: Low

Objective 4. In areas that have degraded flood protection infrastructure, construct set back dikes that ensure that fields behind the setbacks will be better protected and return a portion of the original property to tidal marsh in partnership with the Sustainable Lands Strategy (SLS), Stillaguamish River Flood Control District, and Stillaguamish Technical Advisory Group (STAG).

Strategic Actions

1. Evaluate areas with high salinity due to frequent tidally influenced river flooding.
    a. Opportunity Rank: None

2. Construct set back dikes that protect property.
    a. Opportunity Rank: None

[9] Restoration area subject to change based on updates to the salmon recovery plan.

3. Restore areas on the waterward side of the dike.
    a. Opportunity Rank: None

3.5.2 Chinook Salmon

Note: Available habitat is a key limiting factor for Chinook Salmon restorations. Chinook Salmon Habitat is also addressed within the Delta Strategies.

Objective 1. Remove all project area waters from the Clean Water Act 303(d) list for nutrients and prevent agrochemicals from entering project area waters by 2017.

Strategic Actions

1. Snohomish Conservation District promotes a comprehensive approach to land management for farm owners to include agriculture, habitats and water quality BMPs that incorporates education, grant funds, and other resources or partners to implement BMPs by 2015.
    a. Opportunity Rank: Very High

2. Prevent introduction of priority commercial/residential landscaping chemicals into surface waters by 2015.
    a. Opportunity Rank: High

3. Increase landowner awareness of environmental stewardship as it relates to water quality through education and outreach partnership efforts.
    a. Opportunity Rank: High

Objective 2. Encourage and/or maintain 90% of future growth in the lower Stillaguamish watershed within the Urban Growth Areas (UGAs) by 2020.

Strategic Actions

1. Address vesting laws on lands critical for salmon through sun-setting or other mechanism by 2015.
    a. Opportunity Rank: Low-Medium

2. Re-visit grandfathered non-conforming lots on Ag-10 zoned lands.
    a. Opportunity Rank: None

3. Local governments develop an incentive programs to encourage the maintenance of ecosystem goods and services (ex: flood storage, forest cover and clean water) by 2016.
    a. Opportunity Rank: High

4. Outside of the Urban Growth Area, limit future growth by making access to water utilities stricter by closing sensitive basins (where water rights are already over appropriated) to future exempt wells.
    a. Opportunity Rank: None

3.5.3 Beaches/Forage Fish

Objective 1. Protect 100% of remaining natural shoreline. Where instances of armoring are legally permissible under the single-family exemption in State law, encourage softshore armoring.

Strategic Actions

1. Strengthen Island County's SMP to reduce hard armoring and increase Snohomish County's and Island County's enforcement by 2020 to ensure objective one is met.
    a. Opportunity Rank: Very High

2. Encourage Snohomish and Island Counties to adopt new or existing soft-shore armoring design standards.
    a. Opportunity Rank: High

3. Implementation of education programs targeted at contractors, engineers, realtors and landowners to encourage soft shore armoring and bioengineering, and raise awareness about the impacts of shoreline hardening by 2015, and prevent future armoring.
    a. Opportunity Rank: Very High

4. Change Island County permitting requirements to increase permitting standard for new or enhanced hard armoring and Evaluate Snohomish County permitting requirements to determine if standards for new or enhanced hard armoring are adequate.
    a. Opportunity Rank: High

5. Change permit requirements to shift burden of proof from permitter to landowner to require a review process that includes onsite meetings by interested parties similar to forest resources process.
    a. Opportunity Rank: Low

6. Protect unarmored shoreline parcels in Port Susan through acquisition.
    a. Opportunity Rank: Medium

Objective 2. Enhance functionality of 25% of marine vegetated buffers, on public and private lands, by conserving existing buffers and restoring degraded habitat by 2020.

Strategic Actions

1. Restore 25% of degraded buffers to functional buffers within 100 feet of the marine shoreline by 2020.
    a. Opportunity Rank: Very High

2. Island County SMP amends public and private regulations and incentives for tree and buffer protection by 2014.
    a. Opportunity Rank: Medium

3. Island and Snohomish Counties develop a comprehensive education and outreach plan to enhance marine buffers by 2020.
    a. Opportunity Rank: High

3.5.4 Dungeness Crab

Objective 1. Maintain population structure by reducing take of undersize crabs by at least 50% of WDFW 2011 reported level by 2015 and reduce incidence of Dungeness crab mortality in derelict gear by 50% of WDFW 2011 levels by 2020.

Strategic Actions

1. Implement comprehensive outreach plan to maintain good population structure and reduce loss of fishing gear by 2013 using WDFW crab endorsement funds.
    a. Opportunity Rank: Very High

2. Increase enforcement efforts in Port Susan by 2015 in conjunction with statewide efforts by WDFW.
    a. Opportunity Rank: Medium

3. By 2015, conduct biennial crab pot removal in Port Susan and reduce new pot loss by 50% using WDFW funds from crab endorsement.
    a. Opportunity Rank: Medium

3.5.5 Embedded Invertebrates

Objective 1. Improve health of eastern soft shell clam and sand shrimp populations.

Strategic Actions

1. Develop and institutionalize a Co-management Plan for Eastern soft shell clams with local data.
    a. Opportunity Rank: None

2. Develop and institutionalize a Co-management Plan for sand shrimp.
    a. Opportunity Rank: None

Objective 2. Maintain homeostatic pH levels in Port Susan in perpetuity.

Strategic Actions

1. Develop and implement an early warning pH monitoring system to trigger action when TBD threshold is reached.
    a. Opportunity Rank: None

Objective 3. Eradicate *Spartina* in Port Susan.

Strategic Actions

1. Snohomish and Island County Noxious Weed Control Boards, The Nature Conservancy, Stillaguamish Tribe, and WSU Snohomish County Extension coordinate to continue the monitoring and treatment of *Spartina*.
    a. Opportunity Rank: High

3.5.6 Shorebirds

Objective 1. Maintain quality and quantity of mudflats and intertidal marsh by allowing habitat migration in the face of sea level rise (in perpetuity).

Strategic Actions

1. Set back dikes in delta areas with failing infrastructure to restore a portion of delta habitat (overall goal is a minimum of 315 acres by 2016) and offer increased protection to agricultural lands.
    a. Opportunity Rank: Medium

2. Limit future development in floodplain migration area.
    a. Opportunity Rank: Medium

Objective 2. By 2014, orchestrate local, State, and Federal response to mitigate unintended damages from spill response related impacts to intertidal habitats.

Strategic Actions

1. Ensure that Snohomish and Island Counties have personnel or volunteers trained and coordinated in response tactics to the standards/level of high risk spill areas.
    a. Opportunity Rank: Medium

3.6 Results Chains

The strategies workshop also developed results chains for specific strategic actions. Results chains are used to test the effectiveness of strategies by qualifying the assumptions of how a strategy will produce change. More specifically, they convey the underlying assumptions that link the strategy to the source of stress to the conservation target. The series of "if-then" assumptions that link actions and desired results are mapped in diagrams to capture and communicate these relationships.

Once the strategies were developed for each target during the strategies workshop, the break out groups chose one strategic action and developed a results chain for it. Groups chose the strategy that had a high level of uncertainty, high cost, or for which the link between the strategy and the target was not obvious. For example, Figure 9 displays a results chain that was developed for a strategic action for Chinook salmon that may be difficult to implement: to "address vesting laws on prime fish lands through sun-setting or other mechanism by 2015."

Figure 9. Results chain for Chinook salmon target.

Developing results chains for complicated strategic actions allows the underlying assumptions to be probed, and helps determine which are best for implementation. In this way, CAP outcomes are often a step ahead of similar regional plans because they explicitly consider how to turn the most efficient, cost effective, and feasible objectives into action to achieve a whole ecosystem view of conservation. Following the workshop, the results chains were distributed to the Advisory Team for vetting. Additional work sessions were held with relevant managers to develop further results chains for difficult strategies. Results chains can be found in Appendix D.

Figure 10. Working group developing Results Chain during threats workshop, October 2010.

3.7 Conservation Workplan

Phase II of the Post Susan MSA planning process focused on the development of the Port Susan MSA Workplan. Throughout this process, the Core Team, Advisory Team, and a variety of partners identified the strategic actions that are likely to move forward in the next one to three years. For each strategic action identified, action steps are listed to be carried out by identified partner organizations to meet the conservation goals.

Detailed action steps were developed through a collaborative process during Phase I and II of the planning process by MSA Advisory Team members, key agency partner meetings and during a Measures and Workplan workshop held on October 2nd, 2012. During the Measures and Workplan workshop a total of 25 managers representing 17 different agencies met to develop measures and action steps for ten key strategic actions. Following the workshop, the Core Team held eight partner meetings with key organizations to further develop and review actions steps. The Core Team worked to revises action steps and the Workplan was reviewed a final time with input from the Advisory Team and stakeholders.

Of the 37 strategic actions developed during Phase I of the planning process, 22 are included in the Workplan. The remaining 15 strategic actions, including any draft action steps and measures that were developed, are included in Appendix J. These strategic actions will be added to the work plan as they progress.

The action steps listed in this Workplan span a broad reach of detail for different strategic actions, are intended to act as starting points, and may be revised as progress is made in implementing strategic actions. This Workplan is intended to be a voluntary, working document in which revisions, additions and updates will be made over time as opportunities, resources, partners and funding changes.

3.7.1. River Delta

Objective 1. Increase delta complexity of approximately 200 (+/-) acres between South Pass and Hat Slough and improve flood conveyance by creating a restoration project that increases freshwater inputs to the mudflats by 2020.

Strategic Actions

3. Work with the Snohomish Conservation District and WSU Snohomish County Extension Agriculture Educators to improve BMPs in new and existing channel drainage areas to meet all DOE water quality regulations by 2020.
    Identified Partners: Snohomish Conservation District, Snohomish County Surface Water Management and WSU Snohomish County Extension
        a. Opportunity Rank: High
            i. Action Steps:
                1. Design water quality plan and align with existing water quality monitoring plans along with Quality Assurance Project Plan (QAPP).

2. Snohomish County conducts water quality testing on built channels.
3. Snohomish Conservation District works with landowners who have water quality issues to develop and implement farm plans (BMPs).

Objective 3. Work with farmers, researchers and marketers to develop profitable and environmentally sustainable opportunities to farm under the changing conditions in the Stillaguamish Delta.

Strategic Actions

2. WSU Snohomish County Extension Agriculture and Snohomish Conservation District conduct outreach to teach environmental stewardship and productivity techniques for farmers to respond to growing demand for local food produced with good environmental stewardship techniques (and increase profitability by 10-20% overall).
   Identified Partners: Snohomish Conservation District, Snohomish County Agricultural Services and WSU Snohomish County Extension
   a. Opportunity Rank: Medium
      i. Action Steps:
         1. WSU Snohomish County Extension and Snohomish Conservation District coordinate efforts for local school districts to use local food in cafeterias.
         2. WSU Snohomish County Extension and Snohomish Conservation District coordinate with the upcoming Port Susan Food and Farming center's efforts. http://www.portsusanfoodandfarmingcenter.org/home

3. Promote local sustainable seafood harvesting options for salmon, clams and crustaceans.
   Identified Partners: Snohomish County Surface Water Management, Stillaguamish Tribe, and Tulalip Tribes
   a. Opportunity Rank: Low
      i. *Action Steps*:
         1. Collect historical information on tribal, commercial, and recreational shellfish harvesting areas; identify the players and tell their stories.
         2. Request tribal and/or commercial shellfish harvesters to donate product for an annual outreach event featuring locally grown food.
         3. Request tribal and/or commercial shellfish harvesters to conduct tours of operations for interested parties.
         4. Invite shellfish aquaculture experts to give presentations on shellfish gardening to Port Susan tideland owners.

3.7.2 Chinook Salmon

Note: Available habitat is a key limiting factor for Chinook Salmon restorations. Chinook Salmon Habitat is also addressed within the Delta Strategies.

Objective 1. Remove all project area waters from the Clean Water Act 303(d) list for nutrients and prevent agrochemicals from entering project area waters by 2017.

Strategic Actions

1. Snohomish Conservation District promotes a comprehensive approach to land management for farm owners to include agriculture, habitats and water quality BMPs that incorporates education, grant funds, and other resources or partners to implement BMPs by 2015.

    Identified Partners: Snohomish Clean Water District Advisory Board, Snohomish Conservation District and Snohomish County Surface Water Management

    a. Opportunity Rank: Very High

        i. Action Steps:

            1. Work with scientific community to identify top five chemicals harmful to salmon.
            2. Identify focal group communities that are main drivers to introduction of agrochemicals into surface waters.
            3. Identify specific messaging for focal communities.
            4. Host community meetings to discuss community vision.
            5. Develop additional opportunities for cost share and technical assistance.
            6. Implement BMPs.
            7. Snohomish CWD Advisory Board continues to advise Snohomish Conservation District and Snohomish County SWM on farm project priorities.
            8. Snohomish Conservation District integrates clean water initiatives with incubator farm programs (see Appendix J: River Delta Objective 3, Strategic Action 1).

2. Prevent introduction of priority commercial/residential landscaping chemicals into surface waters by 2015.

    Identified Partners: Snohomish Conservation District, Snohomish County /Camano Island ECO Net, Snohomish County Marine Resources Committee, Snohomish County Surface Water Management and WSU Extension in Snohomish and Island Counties

    a. Opportunity Rank: High

        i. Action Steps:

            1. Work with scientific community to identify top five chemicals harmful to salmon.
            2. Snohomish County SWM, Snohomish Conservation District and Snohomish County/Camano Island ECO Net (Education, Communication and Outreach Network) develop message and campaign strategies.
            3. Existing outreach campaigns, such as “Puget Sound Starts Here” increase outreach and awareness of dangers of these chemicals.

Snohomish County/Camano Island ECO Net targeted awareness project includes information on landscaping in materials.

4. WSU Extension Master Gardeners and Shore Stewards programs in Snohomish and Island Counties provide information for private landowners on natural landscaping techniques that eliminate the need for these top harmful chemicals.
5. Coordinate with the Snohomish County Natural Yard Care program team to focus resources on the residential areas covered by the MSA Plan.
6. Partner with groups throughout Port Susan MSA to create locally based hazardous waste roundup.
7. Increase outreach and awareness of sites that accept chemicals such as the Island County transfer station and the Snohomish County Household Hazardous Waste Facility.
8. Investigate business opportunity for "green" landscaping as part of a lifestyle branding.
9. Snohomish County MRC Mussel Watch program, in partnership with NOAA, along with Island County and WDFW conducts shellfish monitoring data collection.
10. Integrate top three to five chemicals from USGS study into Snohomish County, NOAA Mussel Watch testing.
11. Snohomish County MRC analyzes data from the four Mussel Watch sites in Port Susan to verify changing chemical loadings in partnership with Stillaguamish and Tulalip Tribes.
12. Snohomish Conservation District seeks funding to improve weed management through the implementation of best management practices to reduce quantity of weeds and the subsequent use of chemicals.
13. Snohomish County SWM and Snohomish Conservation District incorporate message and strategies into youth education programs.
14. Develop opportunities to develop outreach strategies and training packages for landscape professionals.

3. Increase landowner awareness of environmental stewardship as it relates to water quality through education and outreach partnership efforts.

   Identified Partners: Snohomish Conservation District, Snohomish County/Camano Island ECO Net, Snohomish County Surface Water Management and WSU Extension in Snohomish and Island Counties

   a. Opportunity Rank: High
      i. *Action Steps:*
         1. Snohomish County/Camano Island ECO Net, Snohomish County SWM, Snohomish Conservation District, and WSU Snohomish County Extension conduct focus group surveys of residential behavior motivators.
         2. Snohomish County/Camano Island ECO Net, Snohomish County SWM, Snohomish Conservation District, and WSU Snohomish

County Extension develop Port Susan Owner's Manual with key information about Port Susan and water quality.

3. Snohomish County/Camano Island ECO Net, Snohomish County SWM, Snohomish Conservation District, and WSU Extension in Snohomish and Island Counties host targeted community open houses for environmental stewardship.
4. Snohomish County SWM, Snohomish Conservation District, and WSU Extension in Snohomish and Island and Master Gardener programs provide education to Port Susan area residents with information on environmental stewardship as it relates to water quality.
5. Collaborate with water quality project partners to better define roles and responsibilities in regard to water pollution code, interpretation and enforcement roles to ensure compliance.

Objective 2. Encourage and/or maintain 90% of future growth in the lower Stillaguamish watershed within the Urban Growth Areas (UGAs) by 2020.

Strategic Actions

3. Local governments develop an incentive programs to encourage the maintenance of ecosystem goods and services (ex: flood storage, forest cover and clean water) by 2016.
   Identified Partners: Snohomish County Planning and Development Services and Snohomish County Surface Water Management
   a. Opportunity Rank: High
      i. Action Steps:
         1. Snohomish County SWM runs "Conservation Priority Index" (CPI) model within project area to determine which parcels have the highest value for the identified ecosystem services.
         2. Snohomish County SWM invites priority parcel landowners to participate in the CPI incentive program.
         3. Landowners implement practices required by CPI program and accept incentive (either reduction in utility fees or direct compensation).
         4. Explore the use of Transfer of Development Rights Program as it relates to soft shore armoring.

3.7.3 Beaches/Forage Fish

Objective 1. Protect 100% of remaining natural shoreline. Where instances of armoring are legally permissible under the single-family exemption in State law, encourage softshore armoring.

Strategic Actions

1. Strengthen Island County's SMP to reduce hard armoring and increase Snohomish County's and Island County's enforcement by 2020 to ensure objective one is met.
   Identified Partners: Island County and Snohomish County

a. Opportunity Rank: Very High
    i. *Action Steps:*
        1. Island County includes a clear definition of soft shore armoring in the SMP code.
        2. Counties conduct training and provide a certification processes for contractors.
        3. Island County develops incentives in the SMP update to encourage landowners to choose softshore alternatives.
        4. Island LIO and Snohomish-Stillaguamish LIO add strategy to local Action Agenda and start looking for funding.
        5. Island County MRC and Tribes comment in writing to SMP coordinator on the need for increased regulations and enforcement.
        6. Island County planning department in partnership with relevant local organizations conduct community workshops to inform citizens about the SMP update and importance of protecting the shoreline.

2. Encourage Snohomish and Island Counties to adopt new or existing soft-shore armoring design standards.

    Identified Partners: Island County, Snohomish County Marine Resources Committee, Snohomish County Planning and Development Services and Washington Department of Fish and Wildlife

    a. Opportunity Rank: High
        i. *Action Steps:*
            1. WDFW completes soft-shore design standards.
            2. Snohomish MRC to monitor when updates are made to WDFW soft-shore design standards.
            3. Island Counties incorporates soft-shore standards into codes and permitting processes.
            4. Snohomish MRC develop proposal to amend Snohomish County shoreline codes. If needed, Snohomish MRC will work with Snohomish County PDS to evaluate proposal and present proposal to the county council.
            5. Snohomish and Island Counties post design standards to relevant websites.

3. Implementation of education programs targeted at contractors, engineers, realtors and landowners to encourage soft shore armoring and bioengineering, and raise awareness about the impacts of shoreline hardening by 2015, and prevent future armoring.

    Identified Partners: Island County, Northwest Straits Marine Initiative, Snohomish and Island County Marine Resources Committees, Washington Sea Grant and WSU Extension in Snohomish and Island Counties

    a. Opportunity Rank: Very High
        i. *Action Steps:*

1. MRCs work with experts to create materials/presentation for development community and determines how best to engage the development/building community.
2. MRCs work with experts to conduct workshops/training on soft-armoring for local engineers and contractors.
3. Snohomish MRC work with Snohomish County PDS to develop one-page fact sheet for permitting counter on soft-shore armoring alternatives.
4. Provide workshops to marine shoreline landowners to prevent bulkheads and encourage soft shore armoring with proven examples of soft shore armoring techniques. Site visits will be provided to provide relevant technical support to marine landowners working to address erosion concerns or potential bulkhead removal.

4. Change Island County permitting requirements to increase permitting standard for new or enhanced hard armoring and Evaluate Snohomish County permitting requirements to determine if standards for new or enhanced hard armoring are adequate.
   Identified Partners: Island County, Snohomish County and Washington Department of Fish and Wildlife
   a. Opportunity Rank: High
      i. Action Steps:
         1. Compile information on why Island County permitting standard for bulkheads needs to be strengthened. Work with WDFW team who are developing case studies.
         2. Evaluate Snohomish County permitting standards for bulkheads.
         3. Involve the legislature.
         4. Identify and work to address barriers for shoreline landowners who wish to install soft shore armoring.
         5. When WDFW design standards are completed, encourage Counties to use as best available science clause requires.

6. Protect unarmored shoreline parcels in Port Susan through acquisition.
   Identified Partners: The Nature Conservancy, Tribes and Whidbey Camano Land Trust
   a. Opportunity Rank: Medium
      i. Action Steps:
         1. Tribes and others identify areas of unarmored shoreline for acquisitions.

Objective 2. Enhance functionality of 25% of marine vegetated buffers, on public and private lands, by conserving existing buffers and restoring degraded habitat by 2020.

Strategic Actions

1. Restore 25% of degraded buffers to functional buffers within 100 feet of the marine shoreline by 2020.

Identified Partners: The Nature Conservancy, Snohomish Conservation District, Snohomish County, Whidbey Camano Land Trust and WSU Snohomish County Extension

a. Opportunity Rank: Very High
    i. *Action Steps:*
        1. MSA partners work with Snohomish Conservation District to develop new grant funds for outreach, planning and implementing of riparian restoration.
        2. Work with partners to identify needs and motivators to engage willing land owner and increase long-term success.
        3. WSU Snohomish County Extension conducts formative research on barriers and motivators of small lot landowners near water to engage willing landowners and increase long-term success.
        4. Improve/create outreach materials on marine buffers and what a functional buffer looks like.
        5. Advisory Team works with STORM Tree planting project to align efforts with MSA buffer goals.
        6. Develop pilot planting project with Snohomish Conservation District to provide plants from the Snohomish County nursery to targeted landowners for buffers.
        7. Work with Snohomish County and Island County Native Plants Stewards to explore plant donations to landowners who are interested in restoring buffers on their properties.

2. Island County SMP amends public and private regulations and incentives for tree and buffer protection by 2014.

    Identified Partners: Island County

    a. Opportunity Rank: Medium
        i. *Action Steps:*
            1. Island County develops regulations and incentives for tree and buffer protection in SMP.
            2. Island County approves SMP.
            3. Island County educates citizens on new SMP requirements.

3. Snohomish and Island Counties develop a comprehensive education and outreach plan to enhance marine buffers by 2020.

    Identified Partners: Snohomish Conservation District, Snohomish County Marine Resources Committee, WSU Snohomish County Extension

    a. Opportunity Rank: High
        i. *Action Steps:*
            1. Develop maps for landowners to show critical areas and help prioritize outreach.
            2. WSU Snohomish County Extension, Snohomish Conservation District and Snohomish County MRC provide information to private landowners on native tree planting on their property.

3.7.4 Dungeness Crab

Objective 1. Maintain population structure by reducing take of undersize crabs by at least 50% of WDFW 2011 reported level by 2015 and reduce incidence of Dungeness crab mortality in derelict gear by 50% of WDFW 2011 levels by 2020.

Strategic Actions

1. Implement comprehensive outreach plan to maintain good population structure and reduce loss of fishing gear by 2013 using WDFW crab endorsement funds.
   Identified Partners: Northwest Straits Foundation, Snohomish County Marine Resources Committee, Washington Department of Fish and Wildlife and WSU Snohomish and Island County Extension Beach Watchers
   a. Opportunity Rank: Very High
      i. Action Steps:
         1. WSU Snohomish County Extension and Snohomish County MRC create a comprehensive outreach plan that includes MRCs, WSU Snohomish County Extension Beach Watchers and WDFW talking with crab fishers, retailers and tribes to educate them on BMPs and laws, and provide further resources; development of educational materials for the public on returning undersized/softshell and female crab to the water without injury.
         2. WDFW requires recreational license holders to take a crustacean certification test online prior to purchasing a recreational license.
         3. WDFW includes information in brochures and websites on how to return undersize and female crabs safely to the water.

2. Increase enforcement efforts in Port Susan by 2015 in conjunction with statewide efforts by WDFW.
   Identified Partners: Snohomish and Island County Marine Resources Committees and Washington Department of Fish and Wildlife
   a. Opportunity Rank: Medium
      i. Action Steps:
         1. State Fish and Wildlife Commission improves monitoring and enforcement to ensure a reduction in take of undersized by at least 50% of current levels (current estimate: 1 in 4 crabs is undersized).

3. By 2015, conduct biennial crab pot removal in Port Susan and reduce new pot loss by 50% using WDFW funds from crab endorsement.
   Identified Partners: Northwest Straits Foundation, Snohomish and Island County Marine Resources Committee, Stillaguamish Tribe and Washington Department of Fish and Wildlife
   a. Opportunity Rank: Medium
      i. Action Steps:

1. WDFW collaborates with Stillaguamish Tribe to conduct selective pot removal in Port Susan at strategic locations using Northwest Straits Foundation derelict gear removal funds.
2. WDFW continues replacement tag buoy program for the commercial fishery, where fishermen must sign an affidavit if they lose a pot.
3. WDFW revises catch card recording system by 2012, to include an anonymous survey question asking recreational crabbers to report lost or stolen pots.
4. MRCs work with Puget Sound Partnership to change State law allowing the sale of pots that do not meet state gear rules.

3.7.5 Embedded Invertebrates

Objective 2. Maintain homeostatic pH levels in Port Susan in perpetuity.

Strategic Actions

1. Develop and implement an early warning pH monitoring system to trigger action when TBD threshold is reached.
    Identified Partners: Stillaguamish Tribe
        a. Opportunity Rank: None
            i. Action Steps:
                1. Coordinate with the Stillaguamish Tribe's "Hyrdro Lab", a water quality buoy in Port Susan collecting real time data. The Tribe has included a pH probe, and is working with ocean acidification experts to determine the best way to monitor acidification in Port Susan.

Objective 3. Eradicate *Spartina* in Port Susan.

Strategic Actions

1. Snohomish and Island County Noxious Weed Control Boards, The Nature Conservancy, Stillaguamish Tribe, and WSU Snohomish County Extension coordinate to continue the monitoring and treatment of *Spartina*.
    Identified Partners: Puget Sound Spartina Task Force, Snohomish and Island County Noxious Weed Boards, The Nature Conservancy and WSU Snohomish County Extension
        a. Opportunity Rank: High
            i. Action Steps:
                1. WSU Snohomish County Extension Beach Watchers volunteers monitor for new *Spartina* invasions in Port Susan nearshore habitat.
                2. Snohomish/Island County Noxious Weed Control Boards eradicate new *Spartina* infestations.
                3. Snohomish/Island County Noxious Weed Control Boards determine status of remaining *Spartina* infestations in Port Susan.

4. Partners seek funding to support final eradication of *Spartina* in Port Susan.

3.7.6 Shorebirds

Objective 1. Maintain quality and quantity of mudflats and intertidal marsh by allowing habitat migration in the face of sea level rise (in perpetuity).

Strategic Actions

2. Limit future development in floodplain migration area.
   Identified Partners: Snohomish County Surface Water Management, Stillaguamish Tribe
   a. Opportunity Rank: Medium
      i. Action Steps:
         1. Stillaguamish Tribe analyzes current protection of floodplain area in Port Susan MSA.
         2. Assist with the implementation of applicable recommendations from the analysis.

Objective 2. By 2014, orchestrate local, State, and Federal response to mitigate unintended damages from spill response related impacts to intertidal habitats.

Strategic Actions

1. Ensure that Snohomish and Island Counties have personnel or volunteers trained and coordinated in response tactics to the standards/level of high risk spill areas.
   Identified Partners: Snohomish County Department of Emergency Management, Snohomish and Island County Marine Resources Committees and WSU Snohomish and Island County Extension Beach Watchers
   a. Opportunity Rank: Medium
      i. Action Steps:
         1. Snohomish and Island County placed on the email list by 2012 for the state drafted geographic response plan and have County representatives attend meetings and comment on plans to facilitate coordinated spill response efforts.
         2. MRCs review the NOAA environmental sensitivity index by 2012 for critical intertidal habitats in Port Susan to ensure that high value areas are boomed.
         3. MRCs review relevant Geographic Response Plans (GRP) and amend them to reflect the first two action steps.
         4. The WSU Snohomish County Extension Beach Watchers program maintains an active volunteer force that can receive specific training by the counties or appropriate response agency to respond as needed in the case of an oil spill.

3.8 Conservation Measures Plan

The development of conservation measures is the final step in Phase II of the Port Susan MSA Conservation Action Planning. Conservation measures provide a mechanism to track whether progress is made relative to the desired results, assess the effectiveness of management actions, and adapt the conservation action plan if needed to get the best results. The process of establishing measures includes determining strategy effectiveness and status assessment information needs, reviewing and refining draft indicators and exploring methods, assigning priority status to all indicators and developing a measures plan.

The following definitions are provided to guide the reader in understanding the measures plan:

- *Strategy Effectiveness* –Used to determine if the conservation actions achieve the desired result.
- *Status Assessment* – Used to determine how the biodiversity, threats to biodiversity and the overall conservation management status are changing.
- *Indicators* – Measurable entities related to a specific information need.
- *Methods* – Specific techniques used to collect data to measure an indicator. Methods vary in their accuracy and reliability, cost-effectiveness, feasibility, and appropriateness.

Indicators may measure both strategy effectiveness and status assessment or transition between the two throughout the project. Good indicators are measurable, precise, consistent and sensitive. Indicators may be embedded within objectives, targets, key ecological attributes or threats identified in the CAP. For each indicator developed, the following criteria were identified:

- Method: how the indicator will be measured
- Who: people responsible for data collection
- When: time and frequency of data collection
- Cost: of monitoring the indicator
- Comments: additional information
- Where: location of data collection
- Who is responsible for analyzing, interpreting & reporting: people responsible for data management and analysis
- What triggers decision making: reasons for developing indicator

Strategy effectiveness measures were developed for each of the strategic actions outlined in the Workplan. These measures are anticipated to move forward in the next one to three years. Additional measures were developed through a collaborative process by MSA Advisory Team members, key agency partner meetings, and during the Measures and Workplan workshop. A total of 25 managers representing 17 different agencies attended the workshop to develop measures for ten of the strategic actions. Following the workshop, the Core Team reviewed the

draft measures to clarify and strengthen them. Measures were reviewed a final time by the Advisory Team and partners. Draft strategy effectiveness measures were developed for some of the strategic actions not anticipated to move forward within the next one to three years, and can be found in Appendix J.

Status assessment measures were developed for selected targets to monitor the status of biodiversity of the conservation targets. Measures were developed by the Core Team and inserted in the Measures Plan. The Core Team selected a subset of viability measures that would indicate most effectively whether or not strategies were affecting the targets. There was also consideration given as to whether or not the indicators gave information on more than one target. Though the hope is to eventually collect data on all the viability indicators, the Core Team recommends that the subset of viability indicators currently in the Measures Plan receive priority for available resources.

Measure Prioritization

After developing the strategy effectiveness indicators, the Core Team went through and assigned a priority status to each indicator. This ranking ensures that the most critical indicators are measured first within the Measures Plan. The priority ranking is as follows:

Very High: Must be monitored
High: High priority for monitoring
Medium: Monitor only if resources allow
Low: Not necessary to monitor

3.8.1 River Delta Objective 1

Strategic Action	Indicator	Rank	Measures
3. Work with the Snohomish Conservation District and WSU Snohomish County Extension Agriculture Educators to improve BMPs in new and existing channel drainage areas to meet all DOE water quality regulations by 2020.	1. Percent of property owners in new and existing channel drainage areas that received education and outreach who have implemented best management practices.	Very High	**Method**: Follow-up with landowners to quantify implementation of BMPs **Who**: Brett deVries (Farm Planner, Snohomish Conservation District) **When**: Annually **Cost**: Unknown, but will consist of staff time for outreach to landowners, monitoring of BMP implementation, reporting and partnerships coordination for reporting **Where**: Snohomish Conservation District office and Port Susan Advisory Team meeting **Who is responsible for analyzing, interpreting & reporting**: Brett de Vries (Farm Planner, Snohomish Conservation District) and others **What triggers decision-making**: Low percent of property owners implementing best management practices

3.8.1 River Delta Objective 3

Strategic Action	Indicator	Rank	Measures
2. WSU Snohomish County Extension Agriculture and Snohomish Conservation District conduct outreach to teach environmental stewardship and productivity techniques for farmers to respond to growing demand for local food produced with good environmental stewardship	1. Number of acres of farmland that are using environmentally sustainable techniques (e.g., Salmon-Safe certification).	High	**Method**: Ask Stewardship Partners (Salmon-Safe) and others how many acres of farmland were certified under environmentally sustainable programs **Who**: Brett deVries (Farm Planner, Snohomish Conservation District) **When**: Annually **Cost**: Low **Where**: Port Susan MSA area **Who is responsible for analyzing, interpreting & reporting**: Snohomish Conservation District **What triggers decision-making**: No increase in acres of

techniques (and increase profitability by 10-20% overall).			salmon safe farmland
3. Promote local sustainable seafood harvesting options for salmon, clams and crustaceans.	TBD	TBD	TBD
Viability Indicators	1. Percent of non-armored shoreline.		**Method**: GIS **Who**: Tulalip Tribes, Snohomish County or Island County **Cost**: May be relatively High, however partnership opportunities for lowering costs are possible
	2. Percent of historical intertidal marsh habitat.		**Method**: GIS **Who**: Tulalip Tribes, Snohomish County or Island County **Cost**: TBD

3.8.2 Chinook Salmon Objective 1

Strategic Action	**Indicator**	**Rank**	**Measures**
1. Snohomish Conservation District promotes a comprehensive approach to land management for farm owners to include agriculture, habitats and water quality BMPs that incorporates education, grant funds, and other resources or partners to implement BMPs by 2015.	1. Number of farmers that were reached with comprehensive land management message.	High	**Method**: Count participants **Who**: Snohomish Conservation District and partners **When**: Quarterly reports (2013 pending grant approval) **Cost**: Unknown **Where**: Snohomish Conservation District **Who is responsible for analyzing, interpreting & reporting**: Snohomish Conservation District **What triggers decision-making**: Less than 20% of farmers in Port Susan are reached with message
	2. Number of farmers that implemented BMPs from comprehensive land management effort.	Very High	**Method**: Surveying the group of people reached to see if they implemented BMPs **Who**: Snohomish Conservation District and partners **When**: Quarterly reports or whenever the SCD current tracks implementation (2015) **Cost**: Unknown **Where**: Snohomish Conservation District

			Who is responsible for analyzing, interpreting & reporting: Snohomish Conservation District **What triggers decision-making**: Count of farmers implementing BMPs is less than 40% of those reached
2. Prevent introduction of priority commercial/ residential landscaping chemicals into surface waters by 2015.	1. Number of commercial and residential landowners applying landscaping chemicals.	High	**Method**: Landowner survey that covers do-it-yourselfers and those who hire landscaping companies **Who**: Snohomish County Surface Water Management and Snohomish County/Camano Island ECO Net **When**: Year 1 and then after outreach **Cost**: Expensive **Where**: Port Susan MSA **Who is responsible for analyzing, interpreting & reporting**: Snohomish County Surface Water Management and Snohomish County/Camano Island ECO Net **What triggers decision-making**: No change in behavior
	2. Level of occurrence of top three to five chemicals in Mussel Watch samples.	Very High	**Method**: Mussel Watch sampling **Who**: Kathleen Herrmann (Lead Staff, Snohomish County Marine Resources Committee) and/or Washington Department of Fish and Wildlife **When**: Annual sampling **Cost**: Unknown (depends on chemicals) **Comments**: Relevant for Chinook Salmon, Objective 1, Strategic Action 3 as well. **Where**: Port Susan **Who is responsible for analyzing, interpreting & reporting**: Kathleen Herrmann (Lead Staff, Snohomish County Marine Resources Committee) and/or Washington Department of Fish and Wildlife **What triggers decision-making**: High levels of chemical in Mussel Watch samples
	3. Additional indicators may be needed once the top 3-5 chemicals have		

	been identified.		
3. Increase landowner awareness of environmental stewardship as it relates to water quality through education and outreach partnership efforts.	1. Level of awareness of landowners about environmental stewardship as it relates to water quality.	Very High	**Method**: Conduct post project audience research/survey to determine if landowner awareness has been increased. **Who**: Chrys Bertolotto (Beach Watcher and Shore Stewards Coordinator, WSU Snohomish County Extension) or Stef Frenzl (Communications Specialist, Snohomish County Surface Water Management) or Lois Ruskell (Outreach Director, Snohomish Conservation District) **When**: Annually **Cost**: High
	2. Water quality parameters (top 3-5 chemicals) in the Stillaguamish River and Port Susan.	Medium	**Method**: Measure key water quality parameters related to top 3-5 chemicals determined to be harmful to salmon. **Who**: Washington State Department of Ecology or Stillaguamish Tribe **When**: Sampling schedule TBD **Cost**: Unknown (depends on chemicals) **Comment**: Relevant to Chinook Salmon, Objective 1, Strategic Action 2 as well **Where**: TBD **Timing & Frequency**: TBD **Who is responsible for analyzing, interpreting & reporting**: Washington State Department of Ecology or Stillaguamish Tribe **What triggers decision-making**: High levels of chemicals in water samples

3.8.2 Chinook Salmon Objective 2

Strategic Action	**Indicator**	**Rank**	**Measures**
3. Local governments develop an incentive programs to encourage the maintenance of ecosystem goods and services (ex:	1. Pilot Program established in Snohomish County by end of 2013.	High	**Method**: Check with Snohomish County Surface Water Management **Who**: Someone on Advisory Team **When**: End of 2013 **Cost**: Low

flood storage, forest cover and clean water) by 2016.			**Comments**: In development in West Fork Woods Creek **Where: Snohomish County** **Who is responsible for analyzing, interpreting & reporting**: Someone on Advisory Team **What triggers decision-making**: Pilot program not established
	2. Program available in Port Susan MSA by end of 2014.	High	**Method**: Check with Snohomish County Surface Water Management **Who**: Someone on Advisory Team **When**: End of 2014 **Cost**: Low **Where**: Port Susan MSA **Who is responsible for analyzing, interpreting & reporting**: Someone on Advisory Team **What triggers decision-making**: Pilot program not available in Port Susan
	3. Number of acres of forest in protected status through incentive program in Port Susan MSA.	High	**Method**: Programmatic review **Who**: Snohomish County Surface Water Management **When**: Annually, once program is available in Port Susan **Cost**: Low (40 hours of staff time) **Where**: Port Susan MSA **Who is responsible for analyzing, interpreting & reporting**: Snohomish County Surface Water Management **What triggers decision-making**: TBD (depends on projected participation)
Viability Indicators	1. Level of top 5 agrichemicals harmful to Chinook		Action pending based on results of studies to determine top five chemicals
3.8.3 Beaches/Forage Fish Objective 1			
Strategic Action	**Indicator**	**Rank**	**Measures**
1. Strengthen Island County's SMP to reduce hard armoring and increase	1. Number of permits approved that allow hard armoring.	Very High	**Method**: Paladin report (Island County Planning Department database query) **Who**: Island County (give to Advisory Team)

Snohomish County's and Island County's enforcement by 2020 to ensure objective one is met.			**When**: Annually **Cost**: Low **Who is responsible for analyzing, interpreting & reporting:** **What triggers decision-making**: Increase in number of permits
	2. Number of actions taken on illegal armoring.	Very High	**Method**: Percent of instances where complaints have follow-up enforcement per Paladin report (Island County Planning Department database query) **Who**: Island County **When**: Annually **Cost**: Low **Who is responsible for analyzing, interpreting & reporting:** **What triggers decision-making**: Increase in enforcement above certain baselines
	3. Number of incentives provided in new Island County SMP (including funding for alternative approaches).	Medium	**Method**: Review approved Shoreline Management Program **Who**: Someone on the Advisory Team **When**: Once the Island County SMP is done **Cost**: Low **Who is responsible for analyzing, interpreting & reporting:** **What triggers decision-making**: Number of incentives not increased in SMP update
2. Encourage Snohomish and Island Counties to adopt new or existing soft-shore armoring design standards.	1. Design standards adopted in Snohomish and Island Counties.	Very High	**Method**: Check with Snohomish and Island County permitting departments **Who**: Someone on the Advisory Team **When**: 2014, once **Cost**: Low **Where**: N/A **Who is responsible for analyzing, interpreting & reporting**: N/A **What triggers decision-making**: No design standards adopted
3. Implementation of education programs targeted at contractors,	1. Number of attendees (by audience) at educational	Very High	**Method**: Count participants by audience **Who**: Snohomish County Marine Resources Committee /Northwest Straits Foundation

engineers, realtors and landowners to encourage soft shore armoring and bioengineering, and raise awareness about the impacts of shoreline hardening by 2015, and prevent future armoring.	programs/workshops.		**When**: Annually **Cost**: Less than $100 **Where**: N/A **Who is responsible for analyzing, interpreting & reporting**: Snohomish County Marine Resources Committee /Northwest Straits Foundation **What triggers decision-making**: Low number of attendees and/or audience missed
	2. Change in awareness of education program participants.	Medium	**Method**: Pre- and post- surveys of participants in educational programs **Who**: Snohomish County Marine Resources Committee /Northwest Straits Foundation **When**: At and after each educational program **Cost**: High – staff time to develop, administer, and analyze results from surveys **Where**: At and after each educational program; perhaps combination of paper and online surveys **Who is responsible for analyzing, interpreting & reporting**: Snohomish County Marine Resources Committee /Northwest Straits Foundation **What triggers decision making**: No change in awareness reported by participants
	3. Number of soft armoring projects as a percent of overall armoring projects initiated by participants.	Very High	**Method**: Follow-up surveys of participants in educational programs **Who**: Snohomish County Marine Resources Committee /Northwest Straits Foundation **When**: 6 months – 2 years following educational programs **Cost**: High – staff time to re-locate participants; develop, administer, and analyze results from surveys **Where**: Online **Who is responsible for analyzing, interpreting & reporting**: Snohomish County Marine Resources Committee /Northwest Straits Foundation

4. Change Island County permitting requirements to increase permitting standard for new or enhanced hard armoring and Evaluate Snohomish County permitting requirements to determine if standards for new or enhanced hard armoring are adequate.	1. Permitting requirements changed.	High	**Method**: Check all relevant permitting requirements (e.g., state, local jurisdictions?) **Who**: Advisory Team **When**: Annually **Cost**: Less than $100 **Where**: N/A **Who is responsible for analyzing, interpreting & reporting**: N/A **What triggers decision making**: No change in permitting requirements
6. Protect unarmored shoreline parcels in Port Susan through acquisition.	1. Linear feet of unarmored shoreline acquired.	High	**Method**: Ask The Nature Conservancy, Whidbey Camano Land Trust, and others **Who**: Someone on the Advisory Team **When**: Annually **Cost**: Low **Where**: Port Susan MSA **Timing & Frequency**: Annually **Who is responsible for analyzing, interpreting & reporting**: Advisory Team
Viability Indicators	1. Percent of historical intertidal marsh habitat		**Method**: GIS **Who**: Tulalip Tribes, Snohomish County or Island County **Cost**: TBD
	2. Length of unarmored shoreline		**Method**: GIS **Who**: Tulalip Tribes, Snohomish County or Island County **Cost**: TBD

3.8.3 Beaches/Forage Fish Objective 2

Strategic Action	**Indicator**	**Rank**	**Measures**
1. Restore 25% of degraded buffers to functional buffers within 100 feet of the marine shoreline by 2020.	1. Acres in protected status within 100 feet of the marine shoreline.	High	**Method**: GIS analysis **Who**: Snohomish County Surface Water Management or Tulalip Tribes **When**: 2013 and then every ~5 years **Cost**: Medium

			Comments: Protected status includes easements, regulatory protection and/or land ownership by land trust or conservation group **Where**: Port Susan MSA **Who is responsible for analyzing, interpreting & reporting**: Snohomish County Surface Water Management or Tulalip Tribes **What triggers decision making**: No increase in protected acres
	2. Acres restored/enhanced.	High	**Method**: Contact project managers for acreage **Who**: Someone on the Advisory Team **When**: Annually **Cost:** Low
2. Island County Shoreline Master Program amends public and private regulations and incentives for tree and buffer protection by 2014.	1. Percent of newly developed properties that comply with buffer regulations.	Medium	**Method**: County Inspector checks new developments **Who**: Island County enforcement division **When**: Annually for five years **Cost**: Salary **Comments**: Could link to effectiveness monitoring in Island County **Where**: Port Susan side of Camano Island **Who is responsible for analyzing, interpreting & reporting**: Island County enforcement division **What triggers decision-making**: Low percentage of developments complying
	2. Number of landowners who take advantage of buffer incentives.	High	**Method**: Ask Island County **Who**: Someone on Advisory Team **When**: Annually **Cost**: Low **Comments**: Depends on incentives developed **Where**: Port Susan side of Camano Island **Who is responsible for analyzing, interpreting & reporting**: Advisory Team **What triggers decision-making**: Low number of landowners

			taking advantage of incentives
3. Island and Snohomish Counties develop a comprehensive education and outreach plan to enhance marine buffers by 2020.	1. An outreach and education plan is being implemented by 2020.	Medium	**Method**: Check with counties and partner organizations to see if workshops, online information and printed materials about riparian buffers are available to public and private property owners **Who**: Advisory Team, someone affiliated with Snohomish Conservation District or WSU Snohomish County Extension **When**: Annually **Cost**: Less than $300 **Where**: Snohomish and Island Counties **Who is responsible for analyzing, interpreting & reporting**: WSU Snohomish County Extension or Snohomish Conservation District **What triggers decision-making**: If it is found that shoreline property owners are not attending workshops, viewing websites or taking printed materials regarding riparian buffers
Viability Indicator	1. Percent of non-armored shoreline		**Method**: GIS **Who**: Tulalip Tribes, Snohomish County or Island County **Cost**: May be relatively High, however partnership opportunities for lowering costs are possible
3.8.4 Dungeness Crab Objective 1			
Strategic Action	**Indicator**	**Rank**	**Measures**
1. Implement comprehensive outreach plan to maintain good population structure and reduce loss of fishing gear by 2013 using WDFW crab endorsement funds.	1. Numbers of recreational and commercial crabbers with inappropriate gear.	High	**Who**: Washington Department of Fish and Wildlife enforcement checks gear **When**: During Summer season, 5 days per week **Cost**: TBD **Where**: On the water in Port Susan **Who is responsible for analyzing, interpreting & reporting**: Washington Department of Fish and Wildlife **What triggers decision-making**: Number does not decrease
2. Increase enforcement efforts in Port Susan by 2015 in conjunction with	1. Percent of undersize crab found in recreational and commercial catch.	High	**Who**: Washington Department of Fish and Wildlife enforcement checks size of crabs **When**: During Summer season, 5 days per week

statewide efforts by WDFW.			**Cost**: TBD **Comment**: Also relevant to Dungeness Crab, Objective 1, Strategic Action 1 **Where**: On the water in Port Susan **Who is responsible for analyzing, interpreting & reporting**: Washington Department of Fish and Wildlife **What triggers decision-making**: Problem already determined. If number increases, assume strategy is not working or there are other factors involved
3. By 2015, conduct biennial crab pot removal in Port Susan and reduce new pot loss by 50% using WDFW funds from crab endorsement.	1. Number of derelict pots.		**Method**: Side Scan Sonar conducted in high use recreational and commercial areas **Who**: Hire consulting firm or work with Northwest Straits Foundation **When**: Every three years **Cost**: $5,000-20,000 **Comment**: Also relevant to Dungeness Crab, Objective 1, Strategic Action 1
	2. Number of derelict pots removed.		**Method**: Ask Northwest Straits Foundation **Who**: Someone on Advisory Team **When**: Annually **Cost**: Low
Viability Indicators	1. Total landings of legal male crab.		**Who**: WDFW, Tribes **Cost**: Covered under WDFW monitoring program

3.8.5 Embedded Invertebrates Objective 2

Strategic Action	**Indicator**	**Rank**	**Measures**
1. Develop and implement an early warning pH monitoring system to trigger action when TBD threshold is reached.	1. pH levels in Port Susan.		**Method**: a water quality buoy in Port Susan that measures and records pH levels every 15 minutes **Who**: Gina Gray (Integration Specialist, Stillaguamish Tribe) **When**: Every three years **Cost**: None **Who is responsible for analyzing, interpreting & reporting:** Franchesca Perez (Outreach biologist, Stillaguamish Tribe) **What triggers decision-making**: Rise in pH that could affect

			shellfish viability. Need to determine course of action
3.8.5 Embedded Invertebrates Objective 3			
Strategic Action	**Indicator**	**Rank**	**Measures**
1. Snohomish and Island County Noxious Weed Control Boards, The Nature Conservancy, Stillaguamish Tribe, and WSU Snohomish County Extension coordinate to continue the monitoring and treatment of Spartina.	1. Area of Spartina infestation in Port Susan.		**Method**: Noxious Weed Control Board/The Nature Conservancy **Who**: Someone on Advisory Team **When**: Annually **Cost**: Low **Where**: Port Susan MSA **What triggers decision-making:** Increase past amount that was agreed to as a maintenance level by the Stillaguamish TAG
3.8.6 Shorebirds Objective 1			
Strategic Action	**Indicator**	**Rank**	**Measures**
2. Limit future development in floodplain migration area.	1. Acres of land converted to development in floodplain.		**Method**: Compare Landsat images to determine if a net increase in development in floodplain areas has occurred. Do this as part of Snohomish County's Land Cover Analysis **Who**: Snohomish County Surface Water Management **When**: 5 years **Cost**: $5,000 **Comments**: Snohomish County Surface Water Management performs a land cover analysis approximately every 5 years. During this analysis, Landsat images are obtained and analyzed for a variety of land cover types. A change in land cover can be determined on an acre scale by comparing the results of this analysis to previous versions **Where**: Floodplains of the mainstem, north and south forks, Stillaguamish River **Who is responsible for analyzing, interpreting & reporting**: Snohomish County Surface Water Management **What triggers decision-making**: A net increase in development in the floodplain over time

3.8.6 Shorebirds Objective 2

Strategic Action	Indicator	Rank	Measures
1. Ensure that Snohomish and Island Counties have personnel or volunteers trained and coordinated in response tactics to the standards/level of high risk spill areas.	1. Number of volunteers trained for readiness in the event of a major oil spill for Snohomish and Island Counties.	Medium	**Method**: Advisory Team (someone who represents the Marine Resources Committee) contacts the WSU Snohomish County Extension Beach Watchers and Marine Resources Committees and to inquire about trained volunteers **Who**: Snohomish and Island County Marine Resources Committees **When**: Annually **Cost**: Low **Where**: Snohomish and Island Counties **What triggers decision-making**: TBD
	2. Geographic Response Plan (GRP) Reviewed and comments provided.	High	**Method**: Advisory Team (someone who represents the MRC) contacts the MRCs and inquire about comments **Who**: Snohomish and Island County MRCs **When**: Annually **Cost**: Low **Where**: Snohomish and Island Counties **What triggers decision-making**: TBD
Viability Indicators	1. Percent of historical intertidal marsh habitat		**Method**: GIS **Who**: Tulalip Tribes, Snohomish County or Island County **Cost**: TBD
	2. Number of Dunlins/yr		**Who**: WDFW **Cost**: Covered under WDFW monitoring program

4. Conclusion and Next Steps

After several years of collaboration, four technical workshops, four public workshops, and countless volunteer hours, over 50 technical advisors (including scientists, key stakeholders, reviewers and the Advisory Team), and 175 citizens and volunteers (including attendance at workshops and citizen science volunteers) have made the Port Susan MSA Conservation Action Plan a reality. In December 2011, both Snohomish and Island County MRCs voted unanimously (with one abstention) to endorse the Port Susan MSA plan. With the identification and assessment of ecosystem targets, threats to targets, and the development of conservation strategies, the Port Susan MSA Conservation Action Plan has made great strides towards realizing conservation in the region. Additionally, more than 25 volunteers participated in the citizen science project developed as a complement to the Port Susan MSA planning process. Volunteers surveyed about 60% of the Port Susan shoreline (excluding the delta area) and collected data on shoreline armoring, marine riparian canopy, and adjacent land use. As part of the adaptive management process, these data can be used to update the viability assessment and inform actions under many of the strategies. For more details on the citizen science project, see Appendix I.

This Phase II Conservation Action Plan includes a workplan and measures plan that will guide the collaborative team in implementing this significant body of work. 2012 has been a year focused on working with the Advisory Team and technical advisors to develop the detailed workplan and measures document. The workplan is based on the strategies identified through this planning process, and will further develop measures to monitor strategy effectiveness (pending funding). The next major step for the Port Susan MSA is to pursue implementation of the conservation strategies designed to achieve ecosystem recovery.

As we proceed with implementation, appropriate measures have been developed to monitor the progress of implementation efforts. Measures allow for assessing the effectiveness of management actions and adaptation of the plan if necessary, to obtain the best results possible. The key ecological attributes and indicators developed during viability assessment can serve in assessing the strategy effectiveness, as can the results chains that lay out a causal chain of assumptions to achieving implementation. Additionally, even where strategies are not implemented immediately, target status should be periodically assessed to determine if it remains at an acceptable state (e.g., meeting long term goals set for that target), or if undesirable changes are detected. These monitoring efforts can serve as an early warning to trigger action or more intensive measurement if target status is in decline. If necessary, strategies will be reviewed and modified with the same approach used to develop them, to ensure that this plan is adaptive moving forward.

Collaborators who have participated throughout the development of the MSA are already stepping forward to implement appropriate strategies. For example, the Snohomish County ECO Net received a grant targeted at rural community outreach to implement some of the education and outreach strategies by developing workshops and mailings for local citizens. The Snohomish MRC in partnership with the Island MRC and the Northwest Straits Foundation received a grant

to prevent hard armoring in Port Susan. Additionally, the Snohomish County Sustainable Lands Strategy may prove to be an apt way to implement the win-win strategies aimed at restoring the Stillaguamish Delta and improving the agricultural community. Additional groups with the authority to sponsor and/or implement strategies will be approached with appropriate work plans. Strategies will also be integrated into other local and regional plans where appropriate, including the Puget Sound Partnership Action Agenda. Finally, the MSA plan, all of the work that has gone into it and the multidimensional organizations that have participated, will serve as a testament to the commitment of the region to ecosystem restoration. As such, it will be used to support future grant proposals to implement strategies and to gain pointed support from collaborators during the grant application process.

While the MRCs and Tulalip Tribes took the lead on this planning process, the outputs are the result of the combined efforts of many organizations, interest groups, managers, community leaders, and citizens who care deeply for the long-term health of Port Susan's marine resources. If the same energy and commitment goes into implementing the draft strategies and monitoring their effectiveness, then this plan will be a success and the benefits will be realized through a healthier ecosystem and more vibrant economy. The Advisory Team encourages others working to protect and restore the resources throughout Port Susan to carefully review this plan and incorporate the outputs into your efforts. If you would like a presentation on the plan, please contact the Snohomish County Marine Resources Committee www.snocomrc.org.

5. References

Batker et al. Unpublished. A New View of the Puget Sound Economy: The Economic Value of Nature's Services in the Puget Sound basin. Earth Economics.

Buchanan, J.B. 2006. Nearshore Birds in Puget Sound. Puget Sound Nearshore Partnership Report number 2006-05. Seattle District, U.S. Army Corps of Engineers, Seattle, WA.

Edwards, S., R. Middaugh, A. Bylin and B Boehm. 2011. Stillaguamish Shellfish Protection Program. Snohomish County Public Works Surface Water Management. March 1, 2011.

Evans, K.E. and J. Kennedy. 2007. San Juan County Marine Stewardship Area Plan. San Juan County Marine Resources Committee.

Evans, K.E. and T.K. Klinger. 2008. Obstacles to Bottom-Up Implementation of Marine Ecosystem Based Management. *Conservation Biology*. 22(5): 1135-1143.

Fisher, W. and D. Velasquez. 2008. Management recommendations for Washington's Priority Habitat and Species. Washington Department of Fish and Wildlife.

Floberg, J., M. Goering, G. Wilhere, C. MacDonald, C. Chappell, C. Rumsey, Z. Ferdana, A. Holt, P. Skidmore, T. Horsman, E. Alverson, C. Tanner, M. Bryer, P. Iachetti, A. Harcombe, B. McDonald, T. Cook, M. Summers, D. Rolph. 2004. Willamette Valley-Puget Trough-Georgia Basin Ecoregional Assessment, Volume One: Report. Prepared by The Nature Conservancy Available from: http://conserveonline.org/workspaces/cbdgateway/era/reports/index_html

Green, A., Raynor, B., Cros, A. Whitford, L., Almany, J., Lubis, F. 2010. Measuring Success of Marine Conservation in the Asia Pacific Region: Coral Triangle and Micronesia Challenge. Prepared by The Nature Conservancy Marine Program of the Asia Pacific Conservation Region.

Griffith, J. 2005. Mapping Nearshore and Delta Habitat in Port Susan. Stillaguamish Tribe, Natural Resources Department. Arlington, WA.

McHugh, M. 2011. Tulalip Tribes Natural Resource Department. Personal Communication, April 2011.

National Audubon Society 2010. Important Bird Areas in the U.S.: Port Susan Bay Site Profile Available from: http://iba.audubon.org/iba/viewSiteProfile.do?siteId=287&navSite=state

NMFS. 2011. Puget Sound Chinook ESU. Northwest Regional Office. Available From:http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Chinook/CKPUG.cfm

Northwest Straits Initiative. 2010a. Performance Benchmarks. Available from:

http://www.nwstraits.org/Archives/Background-History/Performance-Benchmarks.aspx

Northwest Straits Initiative. 2011. Program accomplishments: 2002-present. Derelict Fishing Gear Removal Program. Available from: http://www.derelictgear.org/Progress.aspx

Northwest Straits Marine Conservation Foundation. 2006. Proposal for Funding from the Bullitt Foundation; Ecosystem Based Management in Port Susan, Washington. November 1, 2006.

Northwest Straits Marine Conservation Foundation. 2008. Report to the Harder Foundation; Port Susan Bay Marine Stewardship Area Interview Project, August 2008. Available from: http://www.nwstraits.org/Archives/Library.aspx?year=0&month=0&location=Snohomish+County

OFM. 2010. Office of Financial Management population projections based on 2010 census. Available from: http://www.ofm.wa.gov/pop/april1/

Penttila, D. 2007. Marine Forage Fishes in Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-03. Seattle District, U.W. Army Corps of Engineers. Seattle, WA.

Puget Sound Partnership. 2007. State of the Sound.

Puget Sound Partnership. 2008. Preliminary Draft: Whidbey Basin Characterization.

Puget Sound Partnership. 2009. Puget Sound Action Agenda.

Slater, G.L. 2004. Waterbird monitoring in estuarine habitats of Port Susan Bay and adjacent agricultural lands during fall migration. Ecostudies Institute. Mount Vernon, WA.

Snohomish County. 2002. Comprehensive Plan Update.

Snohomish County. 2009. Draft Resolution to designate Port Susan as a Marine Stewardship Area

Snohomish County Surface Water Management, 2009. Available from: http://www1.co.snohomish.wa.us/Departments/Public_Works/Divisions/SWM/Library/Publications/Water_Quality/default.htm

Soundwide Starrfish Environmental Consulting 2009 Action Agenda for Puget Sound Conservation Districts. Prepared for Washington State Conservation Districts.

Soundwide Starrfish Environmental Consulting. 2010. Ecosystem and Human Well-being statements. Submitted to Snohomish-Camano ECO Net.

Stillaguamish Implementation Review Committee (SIRC). 2005. Stillaguamish Watershed Chinook Salmon Recovery Plan. Published by Snohomish County Department of Public Works, Surface Water Management Division. Everett, WA.

The Nature Conservancy. 2007. Conservation Action Planning Handbook. The Nature Conservancy, Arlington, VA. Available from: http://conserveonline.org/workspaces/cbdgateway/cap/resources/index_html

WA Conservation Commission. 1999 Salmon Habitat limiting factors Final Report. WRIA5 Stillaguamish Watershed.

WA State Employment and Security Department: Labor Marketing and Economic Analysis Branch. 2008. Annual Report.

6. Appendices

Appendix A: TNC Ecoregional Assessment

(Floberg et al. 2004 Appendix 21A)

Stillaguamish River-Port Susan

Section: Puget Trough

Area Type: Terrestrial/Nearshore Marine

Area: 17,427 ha / 43,045 ac

Marine Shoreline: 19.9 km

Ownership / Management	% of Area
County Government	<5 %
Department of Natural Resources	14 %
Preserve	6 %
Washington Department of Fish and	<5 %

Land Use/Land Cover		GAP Management Status			
Agriculture	23 %	1	0 %	4	79%
Developed	5 %	2	1 %	5	2%
Undeveloped	59 %	3	18 %		
Marine/Freshwater	13 %				

Targets known in this Conservation Area:	(Common Name)	(GRank)	(Listing)	(EORank)
Terrestrial Ecological Systems				
	Depressional wetland broadleaf forests	GU		K
	Depressional wetland shrublands	GU		C
	Douglas fir - western hemlock - western redcedar forests	GU		
	Dry evergreen forests and woodlands	GU		
	Intertidal salt marshes	GU		C
	Riparian forests and shrublands	GU		
	Sphagnum bogs and fens	GU		C
Nearshore Marine Ecological Systems				
	Mud flat / Unvegetated	n/a		
	Sand and gravel flat / Unvegetated	n/a		
Nereocystis/Macrocystis/Phyllospadix/Zostera	Mud flat / Subtidal vegetation	n/a		
Phyllospadix/Zostera	Sand and gravel flat / Seagrass	n/a		
Phyllospadix/Zostera	Sand beach / Seagrass	n/a		
Triglochin/Salicornia/Deschampsis/Distichlis/Salicornia	Mud flat / Saltmarsh	n/a		
Triglochin/Salicornia/Deschampsis/Distichlis/Salicornia /Nereocystis/Macrocystis/Phyllospadix/Zostera	Mud flat / Saltmarsh and subtidal vegetation	n/a		
Freshwater Ecological Systems				
	Cascade foothills headwaters - glacial drift and alluvium , low to mid elevation, mixed gradient	n/a		
	Cascades medium rivers - mixed watershed geology traversing glacial drift and alluvium, low elevation, low gradient	n/a		
	Cascades middle river systems - predominantly granitic watershed, low to mid elevation, variable gradient	n/a		
	North Cascades - mafic , mid elevation, mixed gradient	n/a		
	Puget lowland headwaters north - glacial drift, low elevation, low to moderate gradient	n/a		
	Puget Sound tributary rivers - glacial drift, low elevation, low gradient	n/a		
	Puget uplands and islands headwaters - glacial drift, low to mid elevation, low to moderate gradient	n/a		

Species				
Birds				
	Dabbling ducks	G5		
	Diving ducks/bay ducks	G5		
Aechmophorus occidentalis	Western grebe	G5		
Ardea herodias	Great blue heron	G5		A
Branta bernicla	Brant	G5		
Gavia spp	Loons	GU		
Haematopus bachmani, Arenaria melanocephala	Shorebirds-mud/aggregated	GU		
Melanitta spp	Scoters	GU		
Podiceps grisegena	Red-necked grebe	G5		
Various	Wintering raptor concentrations	GU		
Fishes				
Ammodytes hexapterus	Pacific sandlance	G?		
Hypomesus pretiosus	Surf smelt spawning	G?		
Herpetofauna				
Bufo boreas	Western toad	G4	PS	C
Mammals				
Eschrichtius robustus	Grey whale	G4	PS:LE	
Non-Vascular - Moss				
Andreaea megistospora	Andreaea megistospora	G4		K
Vascular Plants				
Salix prolixa (rigida var macrogemma)	Mackenzie willow	G5		K

Impacts assessed in this Conservation Area:		(Urgency)	(Severity)
Terrestrial			
	Grazing practices	High (present or likely within 4 years)	Low
	Forestry practices	High (present or likely within 4 years)	Medium
	Conversion to agriculture or silviculture	High (present or likely within 4 years)	High
	Shoreline stabilization	High (present or likely within 4 years)	Medium
Marine			
	Overfishing, overhunting, over collecting	High (present or likely within 4 years)	High
	Uknown source of water pollution	High (present or likely within 4 years)	Medium
	Channelization of rivers or streams	High (present or likely within 4 years)	High
	Crop production practices	High (present or likely within 4 years)	Low
	Ditches, dikes, drainages and diversions	High (present or likely within 4 years)	Low
	Aquaculture	High (present or likely within 4 years)	Low
	Invasive species	High (present or likely within 4 years)	High
	Industrial discharge	High (present or likely within 4 years)	Medium
	Recreational use	Low (not likely within 10 years)	Medium
	Roads and/or utilities	Low (not likely within 10 years)	Medium
	Residential development	Medium (likely within 5 to 10 years)	Medium
	Collateral damage from fishing	Medium (likely within 5 to 10 years)	Low
	Poaching or commercial collecting	Medium (likely within 5 to 10 years)	Medium

Appendix B: Viability Table

Conservation Targets	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Ratings Source	Date	Current Indicator Measurement	Current Rating	Trend	Source
Shorebirds	Condition	Abundance of food resources	Density of invertebrates in mudflats water column	Data gap	Data gap	Data gap	Data gap		Apr-10	Data gap			
		Community architecture	Abundance of Large Woody Debris for Roosting	Data gap	Data gap	Data gap	Data gap		Apr-10	Data gap			
		Community architecture	Area of winter forage habitat (mudflats, marsh and ag fields)	Data gap	Data gap	Data gap	Data gap		Apr-10	Data gap			
	Size	Population size & dynamics	Number of Dunlins/yr						Dec-10	1988 - 31,000 (winter), 35,000 (spring)	Good	Mild Increase	Rough Guess
Chinook Salmon	Landscape Context	Connectivity among communities & ecosystems	Percent of non-armored shoreline	<50% historic	20-50% historic	**50-80% of historic**	80-100% historic	Expert Knowledge	Apr-10	100%	Good	Mild Decrease	
		Landscape pattern (mosaic) &	Percent of historic intertidal	**<20% historical**	20-50% of historica	50-80 of historic	>80% of historical	Expert Knowledge	May-10		Poor	Mild Increase	

Conservation Targets	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Ratings Source	Date	Current Indicator Measurement	Current Rating	Trend	Source
		structure	marsh habitat		l	al							
	Condition	Community architecture	Arrival of juveniles to the nearshore	very little diversity in arrival	**less evenly distributed and shorter period**	less evenly distributed Feb - July	evenly distributed Feb - July	Expert Knowledge	May-10		Fair	Flat	
		Population structure & recruitment	Juvenile density	<50% historic	**<80% historic**	80%-100% historic	historic	Onsite Research	May-10		Fair	Flat	
		Population structure & recruitment	Juvenile growth	<50% historic	**<80% historic**	80%-100% historic	historic	Expert Knowledge	May-10		Fair	Flat	
	Size	Population size & dynamics	Number of adult Chinook entering the Stillaguamish River from the project area	< 700	**700-3000**	3000-23000	23000-32000	Expert Knowledge	May-10		Fair	Flat	
	Context	Water Quality	Levels of top 5 chemicals harmful to Chinook Salmon	TBD	**TBD**	TBD	TBD		Dec-12	Unknown	TBD	`Unknown	
Forage Fish	Landscape Contex	Soil / sediment stability &	Functioning Feeder Bluff	<50%	50-70%	**70-99% of feeder**	100% intact - no structures	Expert Knowled	Mar-10	70-80% intact	Good	Mild Decre	

Conservation Targets	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Ratings Source	Date	Current Indicator Measurement	Current Rating	Trend	Source
	t	movement				**bluffs intact**	interrupting sediment input	ge				ase	
		Water / soil temperature	Marine riparian shade	<50%	50-75% of potential	**75%-90% of area that could support marine riparian zone**	100% of potential	Expert Knowledge	Mar-10	75%	Good	Flat	
	Condition	Community architecture	Area of intertidal sand and gravel	<50%	50-75%	**75 - 100% of current**	125% of current	Expert Knowledge	Mar-10		Good	Mild Decrease	
		Community architecture	Native Eelgrass and Alga Gracilariopsis Area	<50% of current	50-99% of current	**100% of current**	125% of current	Expert Knowledge	Mar-10		Good	Flat	
	Size	Population size & dynamics	Herring spawning biomass	Stock so low that that permanent	Stock more than 30% below 25 yr	**Stock within 30% of 25 yr mean**	Stock within 10% of 25 yr mean	Onsite Research	Mar-10	71% of 25 yr mean spawning biomass	Good	Flat	Intensive Assessment

Conservation Targets	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Ratings Source	Date	Current Indicator Measurement	Current Rating	Trend	Source
				damage has occurred	mean (with no perm damage)								
Embedded Invertebrates	Landscape Context	Connectivity among communities & ecosystems	Percent of natural shoreline immediately adjacent to the documented clam beds										
		Connectivity among communities & ecosystems	Spatial distribution of ESS clams in suitable habitat										
		Connectivity among communities & ecosystems	Spatial distribution of sand shrimp in suitable habitat										
	Condition	Population structure & recruitment	Relative frequency of size classes for Eastern Softshell Clams										

Conservation Targets	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Ratings Source	Date	Current Indicator Measurement	Current Rating	Trend	Source
	Size	Population size & dynamics	Density/abundance of ESS per unit area										
		Population size & dynamics	Sand shrimp biomass per unit area										
Dungeness Crab	Condition	Community architecture	Total area of preferred juvenile habitat	<50%	50-75%	**75 - 100% of current**	125% of current	Expert Knowledge	Apr-10		Good	Mild Increase	
		Population structure & recruitment	Settlement on beach	<30% potential settlement habitat available	30 - 60 % potential settlement habitat available	**60 - 90% potential settlement habitat available**	100% potential settlement habitat available	Expert Knowledge	Apr-10		Good	Mild Decrease	
	Size	Population size & dynamics	Total landings of legal size male crabs	<4	4-8	**9-13 legal size males per pot pre-season test fisheri**	14 or greater	Expert Knowledge	Apr-10		Good	Flat	

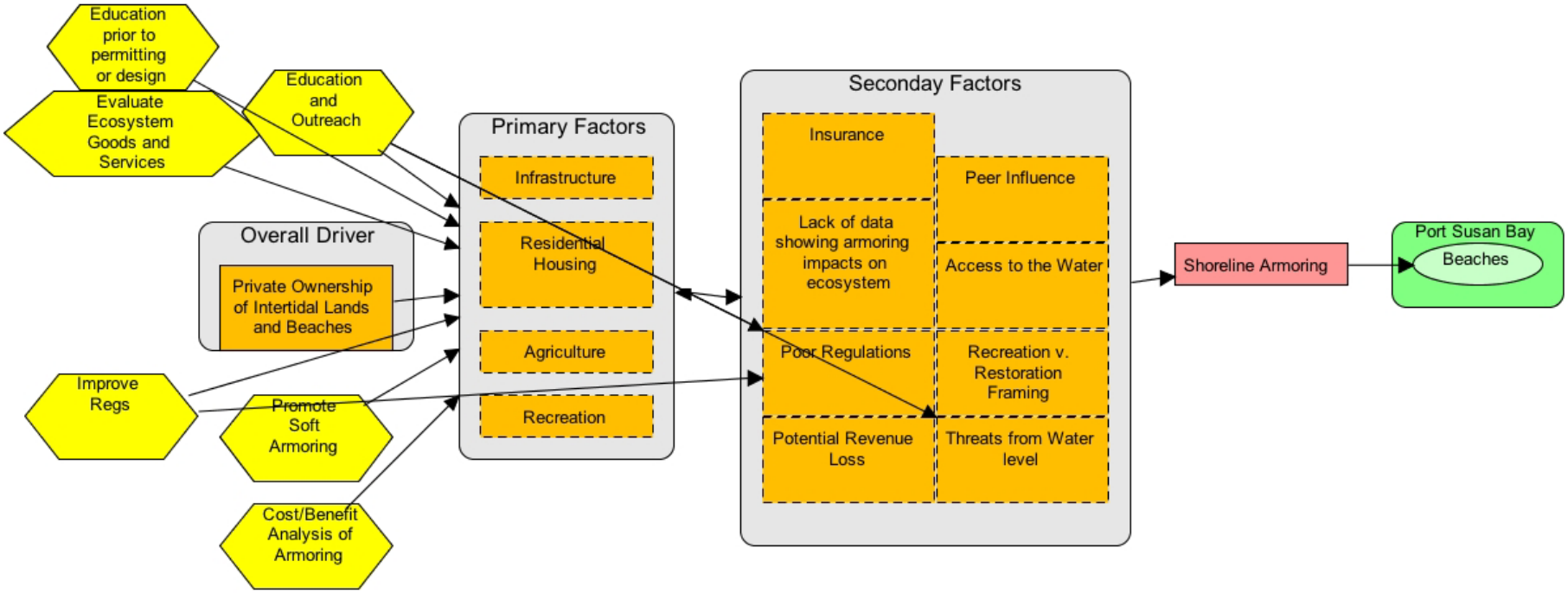
Conservation Targets	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Ratings Source	Date	Current Indicator Measurement	Current Rating	Trend	Source
						es							
River Delta	Landscape Context	Hydrologic regime - (timing, duration, frequency, extent)	River Hydrologic Regime		**outside of natural IHA variability**	within natural IHA variability		Rough Guess	Apr-10		Fair	Mild Decrease	
		Landscape pattern (mosaic) & structure	Number of Distributary Channels by Area	**<20% historical**	20-50% of historical	50-80 of historical	>80% of historical	Expert Knowledge	Apr-10		Poor	Mild Increase	
	Condition	Biological legacies	Number of pieces of LWD by some distance					Rough Guess	Apr-10		Fair	Unknown	
		Community architecture	Area of Delta Habitat (shrub scrub, tidal wetlands, mudflats)	**<30% historic**	30-60% historic	60-80% historic	100% of historic	Expert Knowledge	Apr-10		Poor	Mild Increase	
	Size	Size / extent of characteristic communities / ecosystems	Tidal Inundation Area	**<30% historic**	30-60% historic	60-80% historic	100% of historic	Expert Knowledge	Apr-10		Poor	Mild Increase	

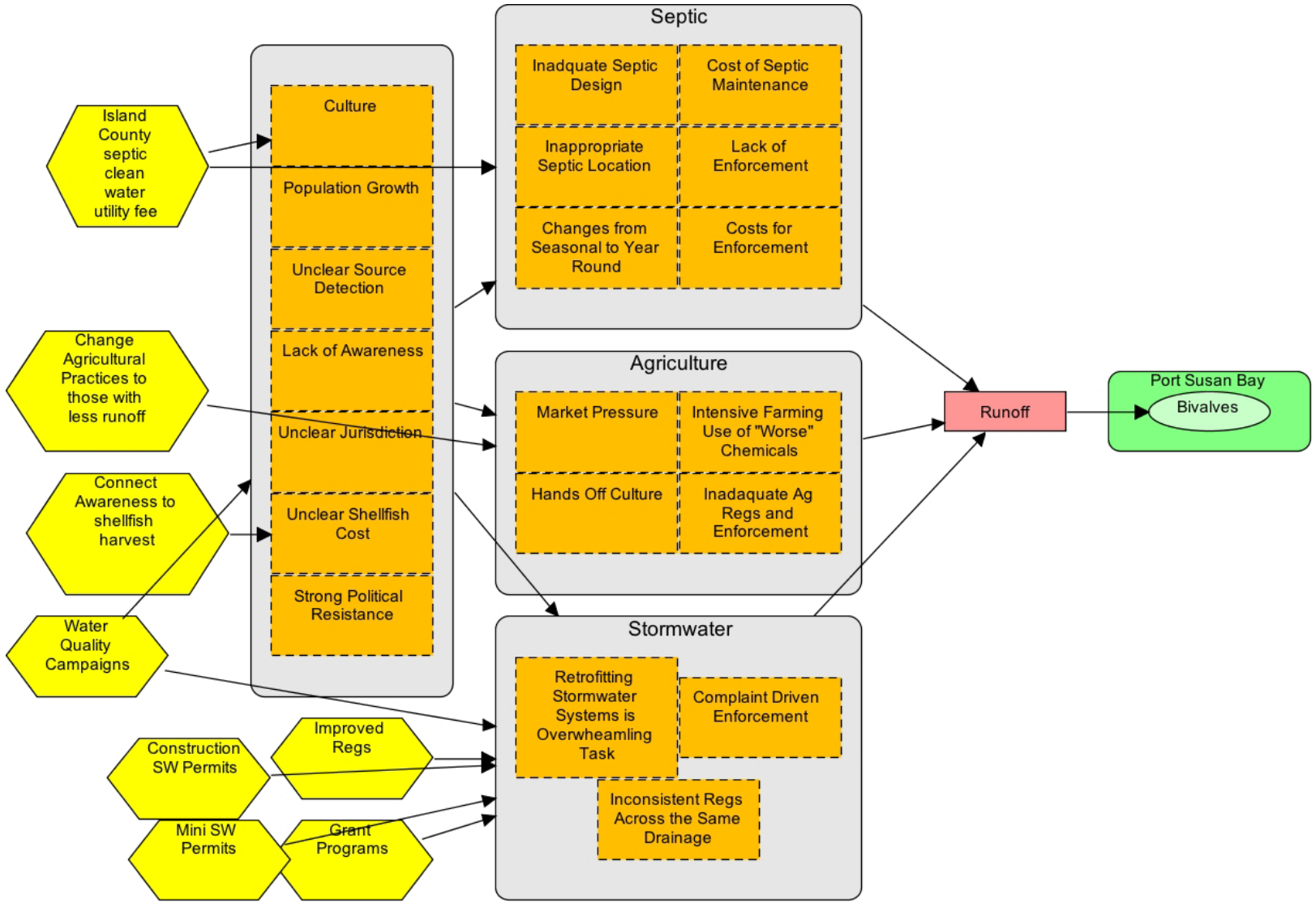
Conservation Targets	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Ratings Source	Date	Current Indicator Measurement	Current Rating	Trend	Source
Beaches	Landscape Context	Connectivity among communities & ecosystems	% of historic tidally accessible area within pocket estuaries subject to tidal inundation	**<25% historic**	25-50% historic	50-75% historic	75 - 100% historic	Expert Knowledge	Apr-10		Poor	Flat	
		Connectivity among communities & ecosystems	Length of non-armored beach	<50%	50-75%	**75 - 100% of current**	125% of current	Expert Knowledge	Apr-10	100%	Good	Mild Decrease	
		Soil / sediment stability & movement	Percent of drift cell length that is fully functional	<30% of cell that is functioning well	30-60% cell functioning well	**60-80% of cell functioning well**	100% of cell functioning	Rough Guess	Apr-10		Good	Flat	
		Water / soil temperature	Marine riparian shade	<50%	50-75% of potential	**75%-90% of area that could support marine riparian zone**	100% of potential	Expert Knowledge	Apr-10	75%	Good	Mild Decrease	

Conservation Targets	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Ratings Source	Date	Current Indicator Measurement	Current Rating	Trend	Source
	Condition	Community architecture	Number of pocket estuaries	<3	**3-6**	7-10	>10	Rough Guess	Apr-10	3-4	Fair	Flat	
		Species composition / dominance	% of historic tidally accessible area within pocket estuaries subject to tidal inundation	**<25% historic**	25-50% historic	50-75% historic	75 - 100% historic	Expert Knowledge	Apr-10		Poor	Flat	
	Size	Size / extent of characteristic communities / ecosystems	Percent of Feeder Bluff length that delivers sediment to the marine env't	<50%	50-70%	**70-99% of feeder bluffs intact**	100% intact - no structures interrupting sediment input	Expert Knowledge	Apr-10		Good	Mild Decrease	

Appendix C: Situation Diagrams

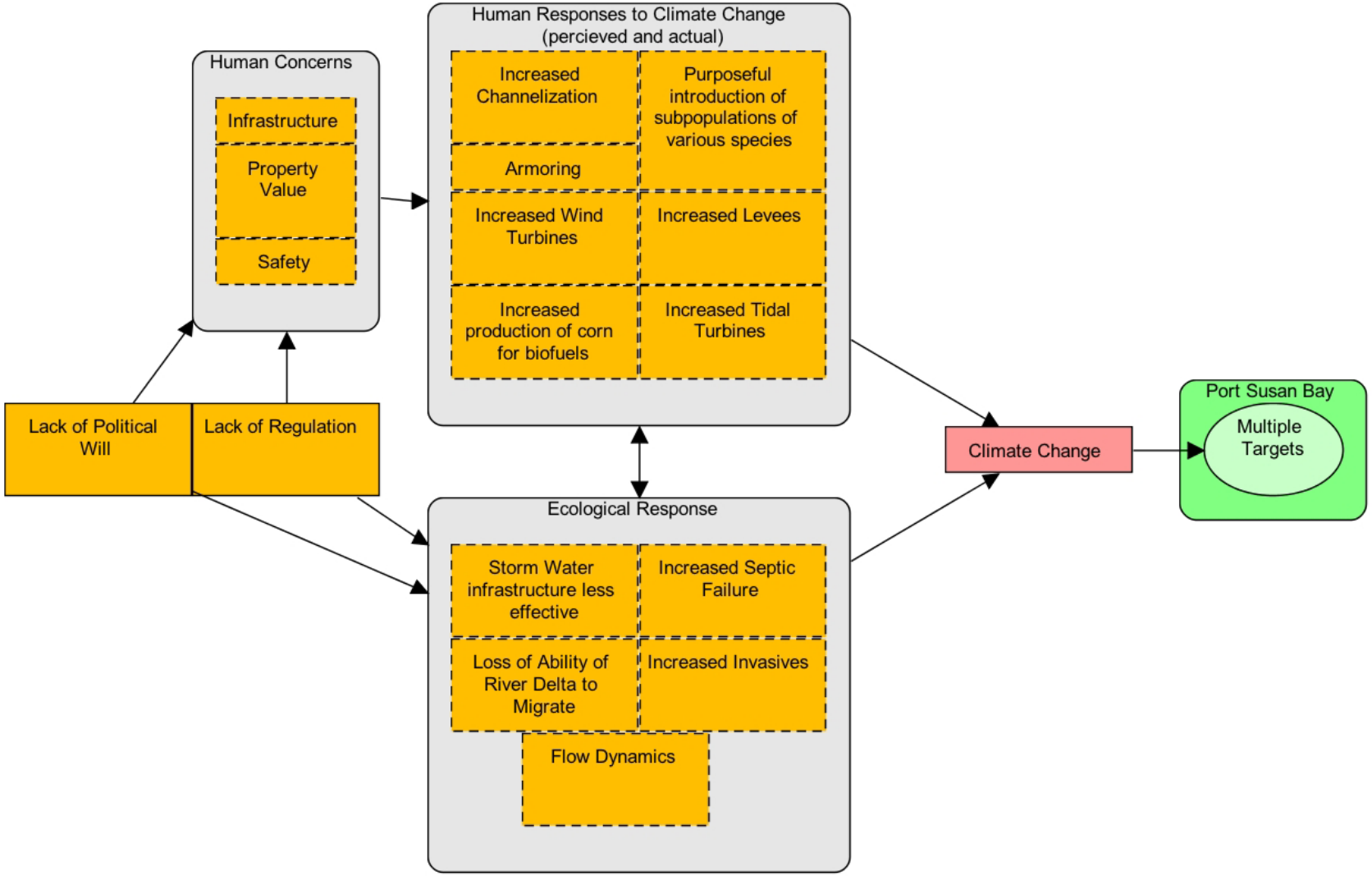
Target: Beaches





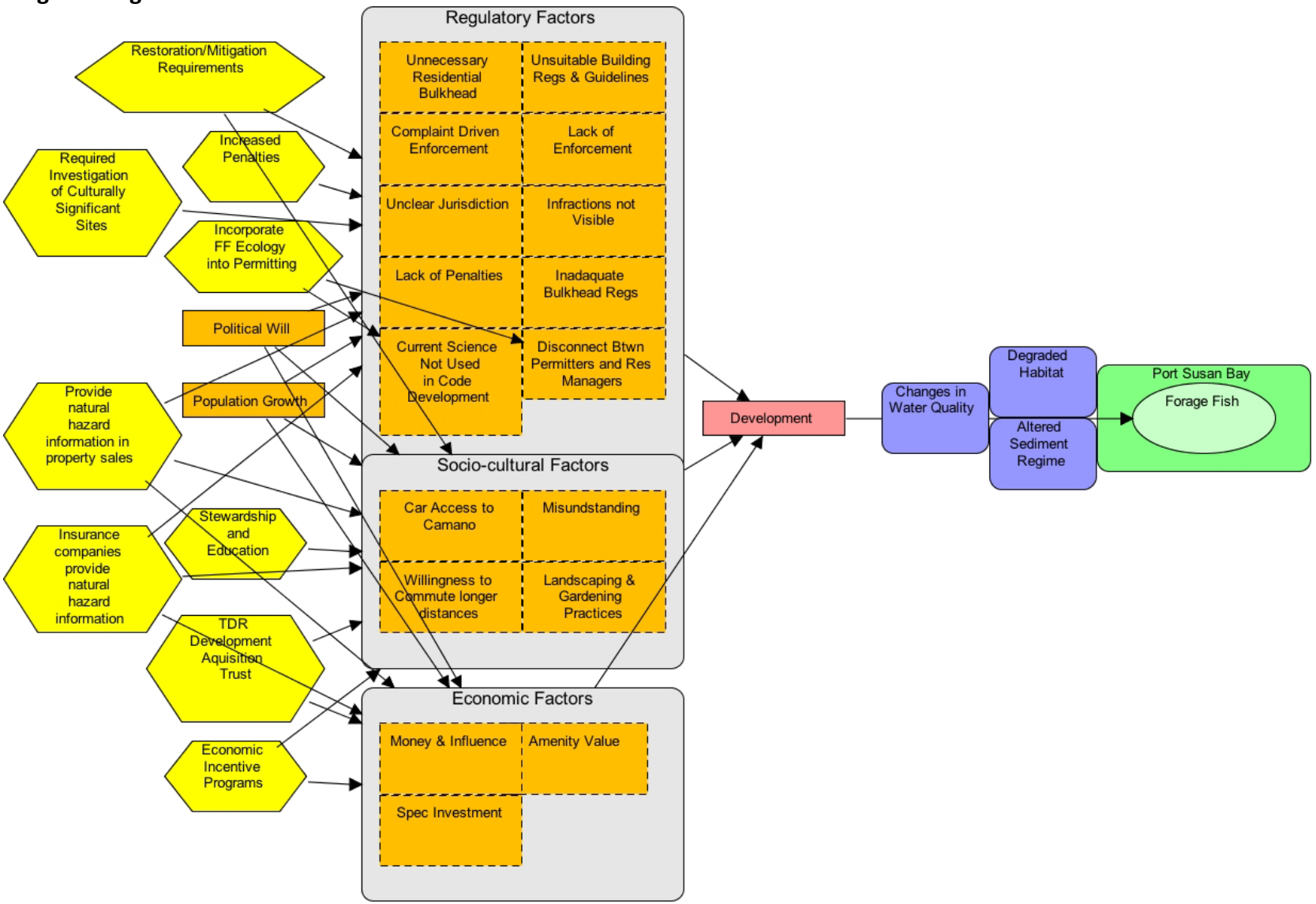
Target: Bivalves

Target: Crustaceans[10]

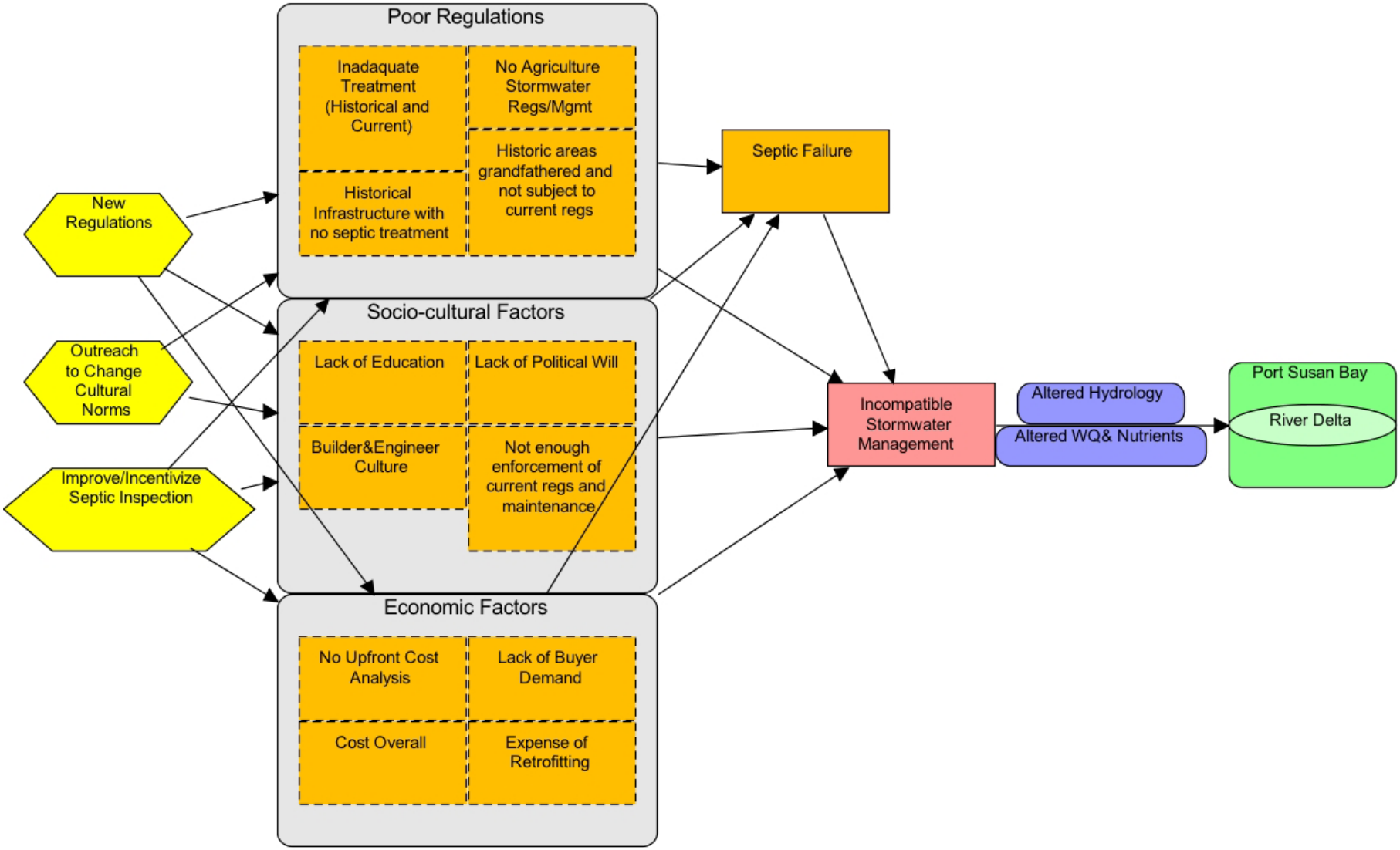


[10] In this case, while the situation diagram was originally developed for Crustaceans, the source of stress is Climate Change, and therefore applies to all targets.

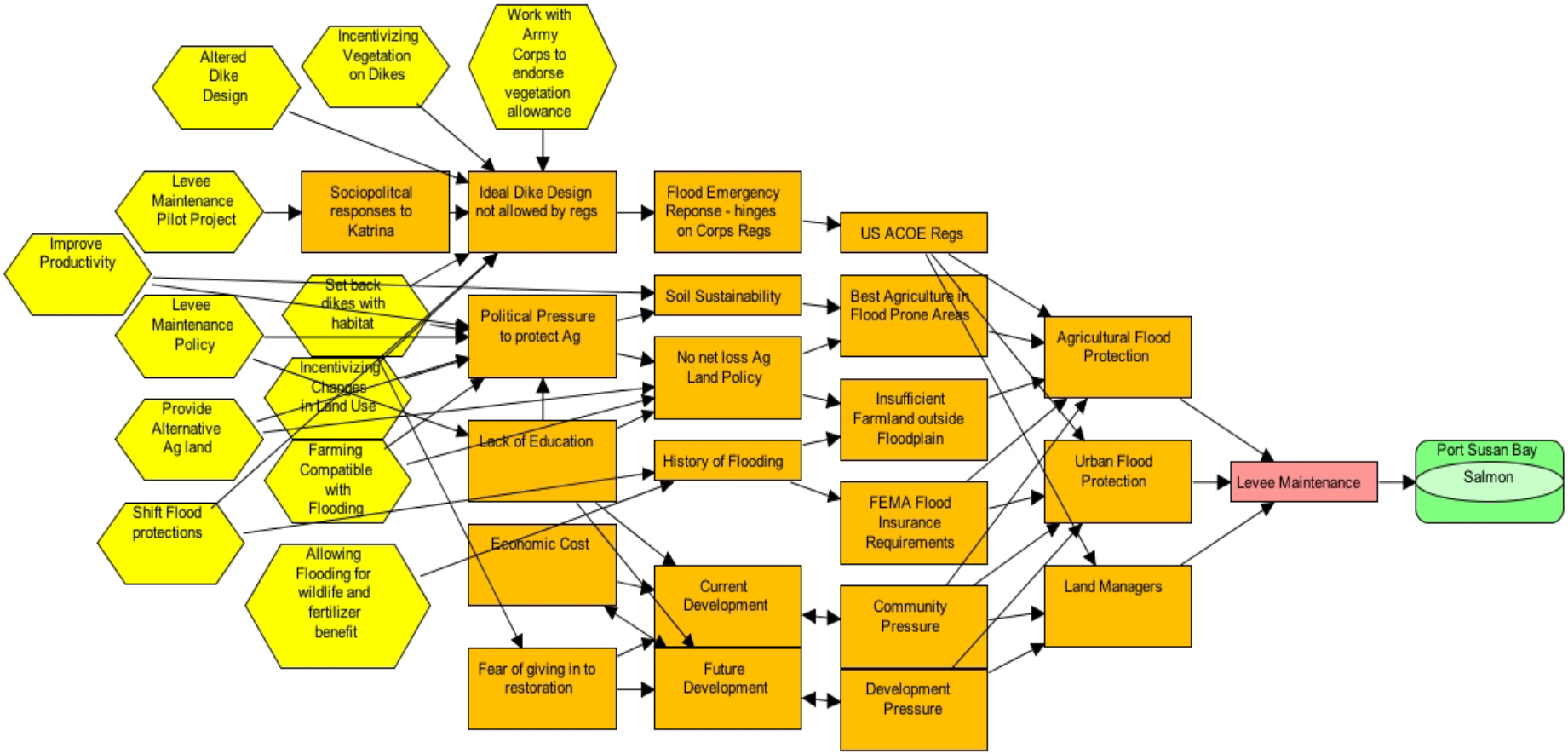
Target: Forage Fish



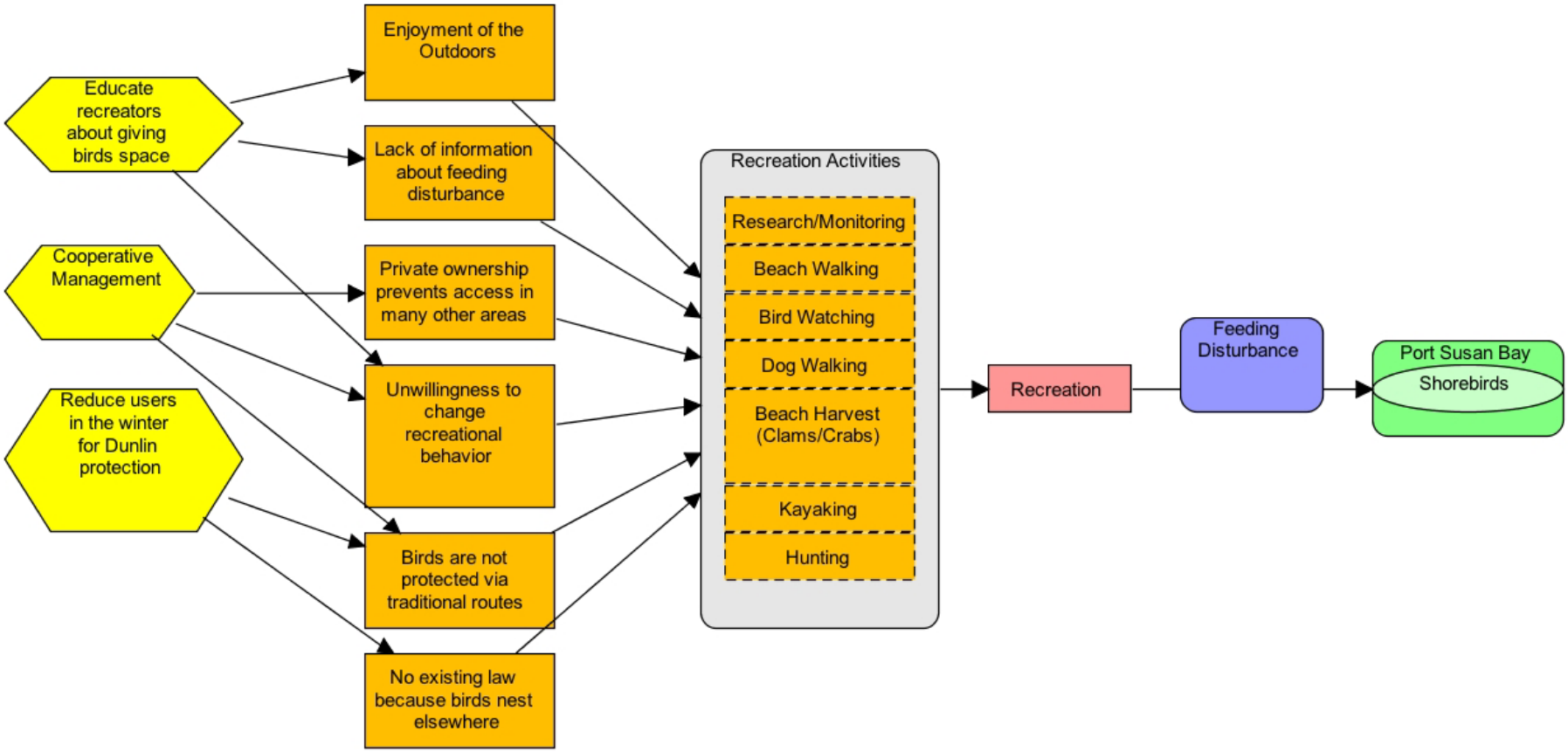
Target: River Delta



Target: Chinook Salmon



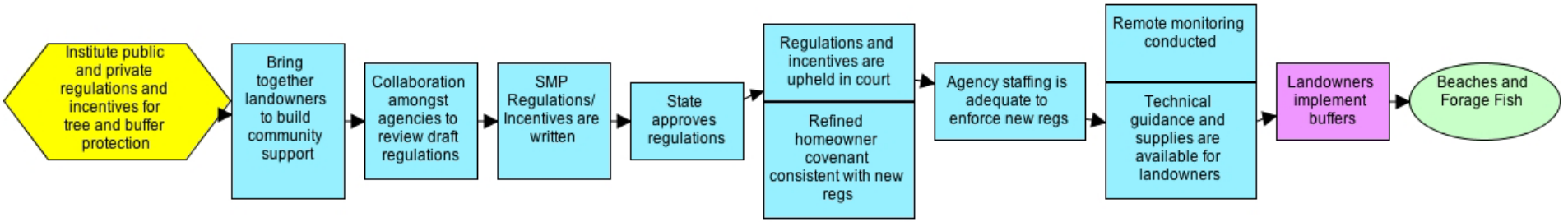
Target: Shorebirds



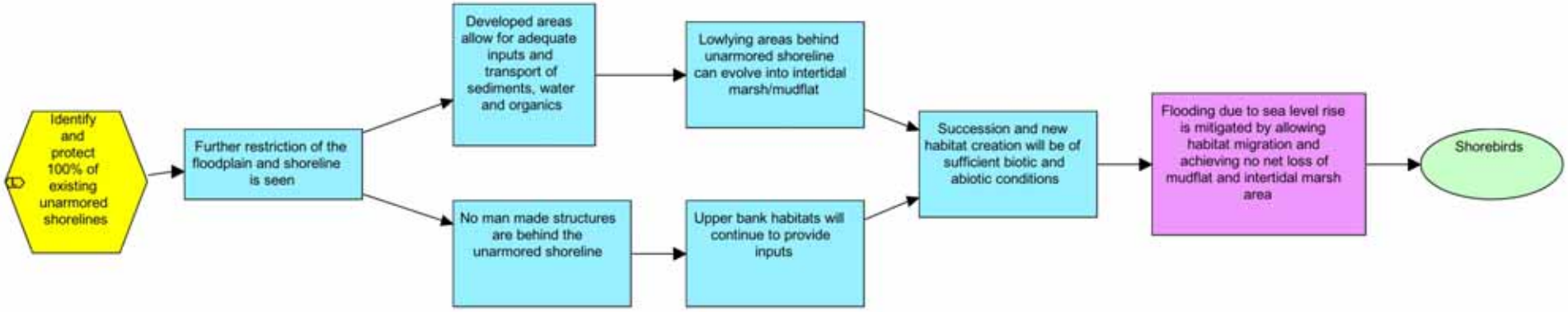
Appendix D: Results Chains

Results Chains are read from left to right, starting with the strategy (yellow), moving through the assumed consequences of taking action (blue), to the affect of the strategy on the stress (pink), to the target (green).

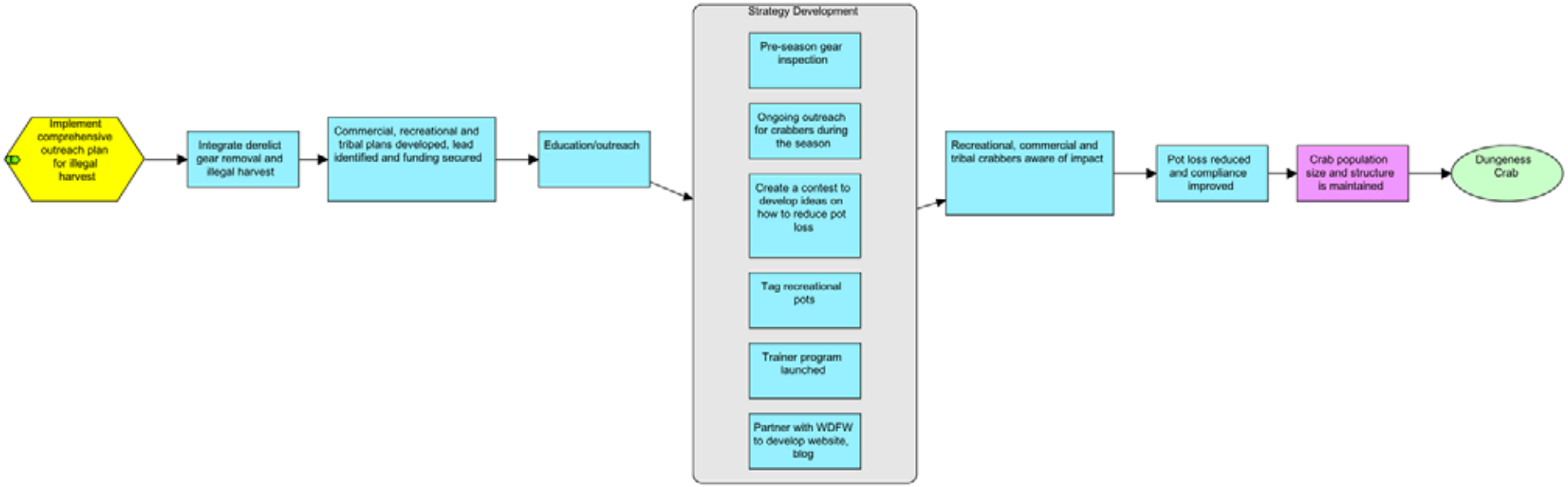
Beaches and Forage Fish



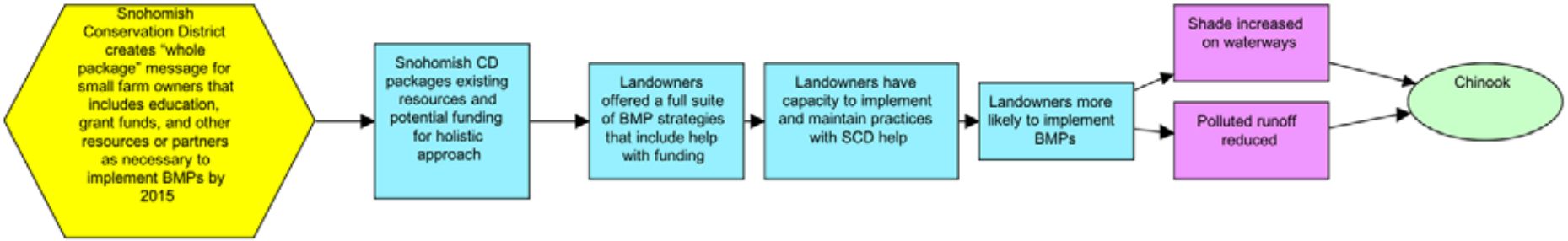
Shorebirds

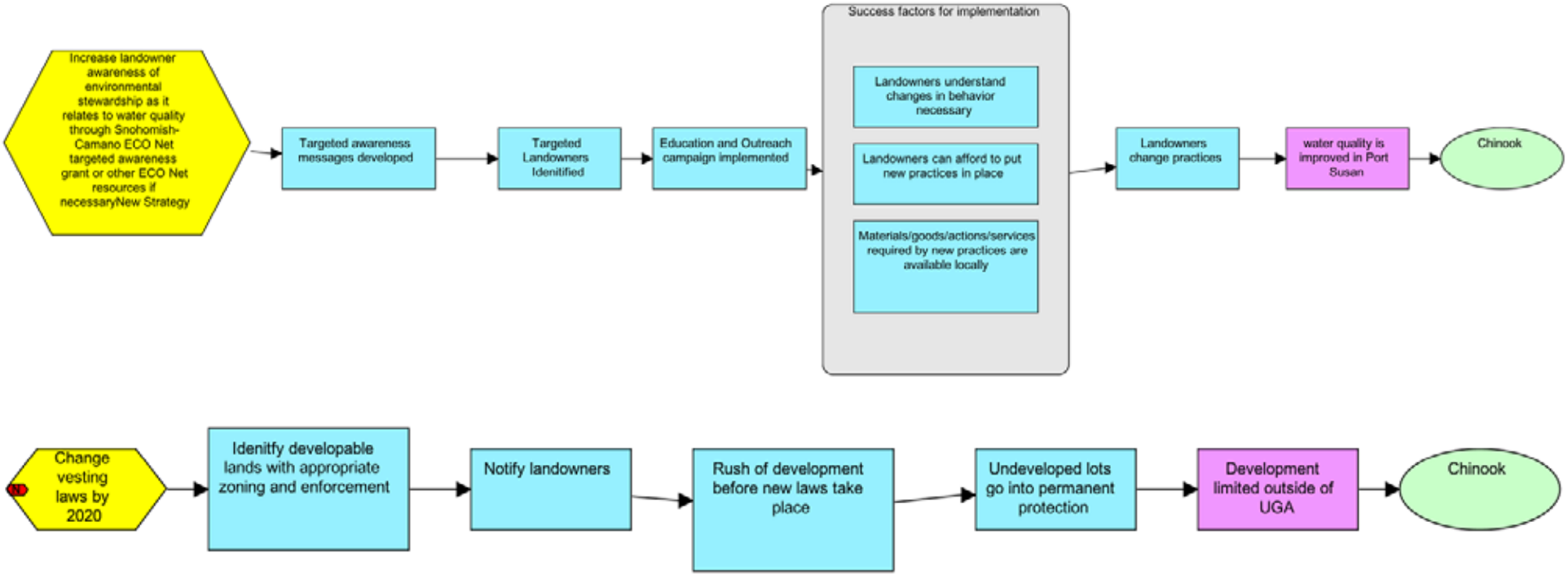


Dungeness Crab

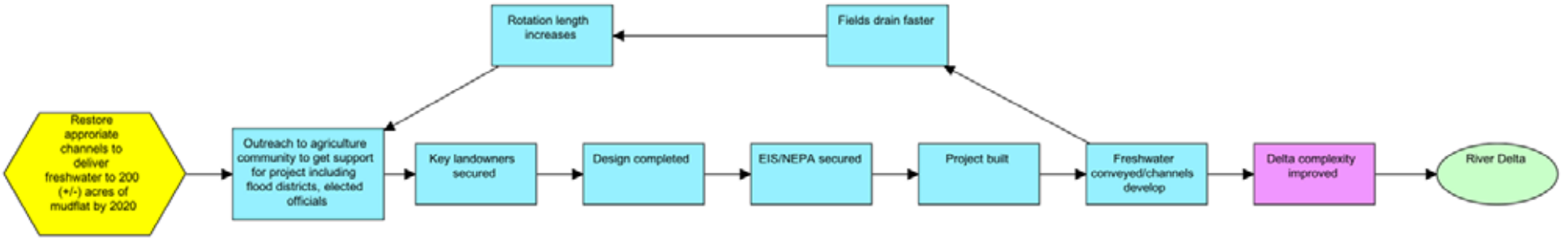


Chinook Salmon




Increase landowner awareness of environmental stewardship as it relates to water quality through Snohomish-Camano ECO Net targeted awareness grant or other ECO Net resources if necessaryNew Strategy
Targeted awareness messages developed
Targeted Landowners Idenitified
Education and Outreach campaign implemented
Success factors for implementation
Landowners understand changes in behavior necessary
Landowners can afford to put new practices in place
Materials/goods/actions/services required by new practices are available locally
Landowners change practices
water quality is improved in Port Susan
Chinook
Change vesting laws by 2020
Idenitfy developable lands with appropriate zoning and enforcement
Notify landowners
Rush of development before new laws take place
Undeveloped lots go into permanent protection
Development limited outside of UGA
Chinook

River Delta


Rotation length increases
Fields drain faster
Restore approriate channels to deliver freshwater to 200 (+/-) acres of mudflat by 2020
Outreach to agriculture community to get support for project including flood districts, elected officials
Key landowners secured
Design completed
EIS/NEPA secured
Project built
Freshwater conveyed/channels develop
Delta complexity improved
River Delta

Appendix E: Data Dictionary

Beaches

Griffith, J. 2005. Mapping Nearshore and Delta Habitat in Port Susan. Stillaguamish Tribe, Natural Resources Department. Arlington, WA.

Higgens, K. 2008. WRIA 8 Beach Nourishment Project-ESRP.

Pedersen, D. 2009. Nearshore Report. Island County Marine Resources Committee.

PSNERP. 2009. PSNERP Tabulation Reports: Whidbey Basin.

Snohomish County Shoreline Management Program. 2006. Shoreline Environment Designations.

Embedded Invertebrates

Bradbury, A., B. Blake, C. Speck, and D. Rogers. 2005. Length-weight models for intertidal clams in Puget Sound. WDFW Fish Management Division.

Campbell, W.W. 1996. Procedures to determine intertidal populations of *Protothaca staminea*, *Tapes philippinarum*, and *Crassostrea gigas* in Hood Canal and Puget Sound, Washington. Washington Department of Fish and Wildlife, Procedures Manual MRD96- 01.

Dethier, M. N. 2006. Native Shellfish in Nearshore Ecosystems of Puget Sound. Puget Sound Nearshore Partnership Report No. 2006-04.

Donovan, D.A., P.A. Elsasser, J.W. Wittes. 2010. Broad salinity tolerances of the invasive clam Nuttallia obscurata. In proceedings of Society for Integrative and Comparative Biology 2010 Annual Meeting January 3-7. Seattle, WA.

Dudas, S. E. 2005. Invasion dynamics of a non-indigenous bivalve, *Nuttallia obscurata*, (Reeve 1857), in the Northeast Pacific. Dissertation. University of Victoria, Victoria, British Columbia, Canada.

Dudas, S. E., and J. F. Dower. 2006. Reproductive ecology and dispersal potential of the varnish clam, *Nuttallia obscurata*, a recent invader in the Northeast Pacific. Marine Ecology Progress Series 320:185–194.

Dudas, S.E., J.F. Dower, and B.R. Anholt. 2007. Invasion dynamics of the varnish clam (*Nuttallia obscurata*): A matrix demographic modeling approach. Ecology. 88(8): 2084–2093.

Edwards, S., R. Middaugh, A. Bylin and B Boehm. 2011. Stillaguamish Shellfish Protection Program. Snohomish County Public Works Surface Water Management. March 1, 2011.

Fyfe, David. 2002. Surveying intertidal clam populations and assigning annual harvestable biomass. Appendix 1 in 2005 Bivalve Management Plan for Public Tidelands in Region 6: Central Puget Sound.

Pacific Shellfish Institute. 2007. Port Susan Shellfish Certification Study. Prepared for Snohomish County Public Works Surface Water Management.

Shishido, C.M., J.L. Burnaford, S.Y. Henderson. 2010. The effect of sediment type of the distribution of the invasive purple varnish clam and associated native kleptoparasitic pea crabs on Pacific Northwest beaches. In proceedings of Society for Integrative and Comparative Biology 2010 Annual Meeting January 3-7. Seattle, WA.

Storm, A. and A. Bradbury. 2007. Estimating Recreational Clam and Oyster Harvest in Puget Sound. Washington Department of Fish and Wildlife Fish Management Division.

Wittes, J.S. and D.A. Donovan. 2010. Broad physiological tolerances of the invasive clam, *Nuttallia obscurata*. In proceedings of Society for Integrative and Comparative Biology 2010 Annual Meeting January 3-7. Seattle, WA.

Chinook Salmon

Beamer, E., A. McBride, R. Henderson, and K. Wolf. 2003. The importance of non-natal pocket estuaries in Skagit bay to Chinook Salmon. Skagit System Cooperative Research Department

Stillaguamish Smolt Data (WDFW)
Stillaguamish Chinook Production 2003-2008
Chinook CPUE and River Discharge 2001
Chinook Catches 2002
Chinook Migration 2003, 2004
Wild and Hatchery Chinook CPUE 2005
Chinook CPUE and Flow 2006, 2007, 2008

Stillaguamish and Snohomish Chinook Escapement Data 1965-2009

Stillaguamish Tribe. 2009. Stillaguamish Estuary Use by Juvenile Chinook Final Report. June 2009.

Puget Sound Indian Tribes and WDFW. 2010. Comprehensive Management Plan for Puget Sound Chinook: Harvest Management Component.

USGS Hydrologic Record (a few sites follow, but many more to be found using: http://wdr.water.usgs.gov/nwisgmap/index.html)
USGS 12158010 Tulalip Creek above east branch near Tulalip, WA
http://waterdata.usgs.gov/nwis/uv?site_no=12158010
USGS 12158032 East branch Tulalip creek nr mouth nr Tulalip, WA

http://waterdata.usgs.gov/nwis/uv?site_no=12158032
USGS 12158040 Tulalip creek near Tulalip, WA
http://waterdata.usgs.gov/nwis/uv?site_no=12158040
USGS 12157250 mission creek near Tulalip, WA
waterdata.usgs.gov/nwis/uv?site_no=12157250
USGS 12157025 Quilceda cr trib ab 27th ave ne nr Marysville, WA
waterdata.usgs.gov/nwis/uv?site_no=12157025
USGS 12155500 Snohomish River at Snohomish, WA

Washington State Conservation Commission. 1999. Salmon Habitat Limiting Factors Final Report. Water Resource Area 5: Stillaguamish Watershed

Washington State Conservation Commission. 2002. Salmonid Habitat Limiting Factors Analysis. Water Resource Area 7: Snohomish River Watershed

Water Resource Inventory Area 7 – Snohomish Basin Report, Stream Catalog

Water Resource Inventory Area 6 (Whidbey and Camano Islands) 2005. Multispecies Salmon Recovery Plan

Dungeness Crab

Dethier, M. N. 2006. Native Shellfish in Nearshore Ecosystems of Puget Sound. Puget Sound Nearshore Partnership Report No. 2006-04.

Fisher, W. and D. Velasquez. 2008. Management Recommendations for Washington's Priority Habitats and Species: Dungeness Crab, *Cancer magister*. WDFW.

McMillan et al. 1995 Comparison of Intertidal Habitat Use and Growth Rates of Two Northern Puget Sound Cohorts of 0+ Age Dungeness Crab, *Cancer magister*. Estuaries. 18(2): 390-398.

Northwest Straits Foundation. 2007. Derelict Fishing Gear Priority Ranking Project

Maps
Snohomish County Dungeness Crab Distribution and Recreational Harvest Map, 2002

Forage Fish

Griffith, J. 2005. Mapping Nearshore and Delta Habitat in Port Susan. Stillaguamish Tribe, Natural Resources Department. Arlington, WA.

Stick, K. and A. Lindquist. 2009. 2008 Washington State Herring Stock Status Report. WDFW. November 2009

Mumford, T.F. 2007. Kelp and Eelgrass in Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-05

Penttila, D. 2007. Marine Forage Fishes in Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-03.

Shipman, H. 2004. Coastal Bluffs and Sea Cliffs on Puget Sound, Washington. U.S. Geological Survey Professional Paper 1693

Small et al. 2005 Temporal and Spatial Genetic Structure among Some Pacific Herring Populations in Puget Sound and the Southern Strait of Georgia. *Transactions of the American Fisheries Society*. 134: 1329-1341.

Maps
Snohomish County Eelgrass Distribution Maps, 2002
Snohomish County Forage Fish Distribution Map, 2002
Snohomish County Shoreline Types Map (sand/gravel etc.), 2002
Snohomish County Shoreline Modifications Map (armoring) 2002
Island County Eelgrass Survey 2000
Island County Eelgrass monitoring 2010

River Delta

Borde et al. 2003 Geospatial Habitat Change Analysis in Pacific Northwest Estuaries. Estuaries 26(4B): 1104-1116.

Coil, G. 2004. Tulalip Reservation Hazard Mitigation Plan. Tulalip Tribes.

Collins 2000. Mid-19th century stream channels and wetlands interpreted from archival sources for three north Puget Sound estuaries. Prepared for: Skagit System Cooperative.

Collins and Seikh 2005. Historical reconstruction, classification and change analysis of Puget Sound tidal marshes. Puget Sound River History Project. WDNR.

Griffith, J. 2005. Mapping Nearshore and Delta Habitat in Port Susan. Stillaguamish Tribe, Natural Resources Department. Arlington, WA.

Heatwole, D. 2006. Habitat Mapping and Characterization in Port Susan Bay: Summary of 2004 and 2005 Monitoring. TNC. May 2006.

NOAA Restoration Center. 2009. Logjam Restoration in the Stillaguamish Estuary / Port Susan Bay Large Wood Project. Community Based Restoration Program, Final Report.

Rustay, M., A. Haas and S. Hare. 2009. Snohomish County Shoreline Inventory Status Report For Snohomish County Critical Area Monitoring. Surface Water Management

Puget Sound River Histories Project. 2008. Geodatabase of Puget Sound's pre-settlement river

valley, estuary and nearshore habitats. Available at:
http://flow.ess.washington.edu/puget_historical/

PSNERP Whidbey Subbasin Tabulations
Summary of shoreline types, drift cells and drainage

Yang, Z., T. Khangaonkara, M. Calvi, K. Nelson. 2009 Simulation of cumulative effects of nearshore restoration projects on estuarine hydrodynamics. Ecological Modeling.

Yang, Z. K. L. Sobocinski, D. Heatwolec, T. Khangaonkar, R. Thom, R. Fuller. 2010. Hydrodynamic and ecological assessment of nearshore restoration: A modeling study. Ecological Modeling. 221: 1043-1053.

Maps
2006 Snohomish Watershed Management Area Map
2006 Stillaguamish Clean Water District Map
Snohomish County Surface Water Management Districts Map

Shorebirds

Audubon Washington. 2009. State of the Birds: 2009. Birds and Climate Change: Washington's Birds at Risk.

Buchanan, J.B. 2006. Nearshore Birds in Puget Sound. Puget Sound Nearshore Partnership Report number 2006-05. Seattle District, U.S. Army Corps of Engineers, Seattle, WA.

Cullinan, T. 2001. Important Bird Areas of Washington. Audubon Washington, Olympia, Washington. 170 pp.

Drut, M.S. and J.B. Buchanan 2000. Northern Pacific Coast Regional Shorebird Management Plan. U.S. Shorebird Conservation Plan. Revised March 20, 2000.

Evanson, J.R. and J.B. Buchanan. 1997. Seasonal Abundance of Shorebirds at Puget Sound Estuaries. Washington Birds. 6:34-62.

Mlodinow, S., D. Irons, and B. Tweit. 2005. Oregon and Washington. North American Birds. 59(4): 644-648

National Audubon Society 2010. Important Bird Areas in the U.S.: Port Susan Bay Site Profile Available from: http://iba.audubon.org/iba/viewSiteProfile.do?siteId=287&navSite=state

NOAA Restoration Center. 2009. Logjam Restoration in the Stillaguamish Estuary / Port Susan Bay Large Wood Project. Community Based Restoration Program, Final Report.

Puget Sound Seabird Study. 2010. Kayak Point State Park Bird Counts. October 2009-April

2010.

Slater, G.L. 2004. Waterbird monitoring in estuarine habitats of Port Susan Bay and adjacent agricultural lands during fall migration. Ecostudies Institute. Mount Vernon, WA.

Other/General

Beck et al. 2004. New Tools for Marine Conservation: the Leasing and Ownership of Submerged Lands. Conservation Biology. 18(5): 1214-1223.

Climate Adaptation Knowledge Exchange. 2010. Effects of Sea Level Rise in Port Susan Bay. December 18, 2010. Available from: http://www.cakex.org/case-studies/2793

Evans, K.E. and J. Kennedy. 2007. San Juan County Marine Stewardship Area Plan. San Juan County Marine Resources Committee.

Evans, K.E. and T.K. Klinger. 2008. Obstacles to Bottom-Up Implementation of Marine Ecosystem Based Management. *Conservation Biology*. 22(5): 1135-1143.

Floberg, J., M. Goering, G. Wilhere, C. MacDonald, C. Chappell, C. Rumsey, Z. Ferdana, A. Holt, P. Skidmore, T. Horsman, E. Alverson, C. Tanner, M. Bryer, P. Iachetti, A. Harcombe, B. McDonald, T. Cook, M. Summers, D. Rolph. 2004. Willamette Valley-Puget Trough-Georgia Basin Ecoregional Assessment, Volume One: Report. Prepared by The Nature Conservancy with. Available from http://conserveonline.org/workspaces/cbdgateway/era/reports/index_html Appendix 21A – Summaries of Terrestrial and Marine PCAs (p300-302)

Hacker, S.D., D. Heimer, C. E. Hellquist, T. G. Reeder, B. Reeves, T. J. Riordan, and M N. Dethier. 2001. A marine plant (*Spartina anglica*) invades widely varying habitats: potential mechanisms of invasion and control. *Biological Invasions*. 3:211-217

WDOE publications on WRIA 5 (mostly on water quality) Available from:
http://www.ecy.wa.gov/biblio/wria05.html

Weitkamp et al. 1992. Gray whale foraging on ghost shrimp in littoral sand flats of Puget Sound, U.S.A. *Canadian Journal of Zoology*. 70: 2275-2280.

GIS

Snohomish County GIS data Inventory

From Frank Leonetti at Snohomish County Surface Water Management
frank.leonetti@snoco.org
Four Discs of Data consist of:

Disc 1 “Orthophotos, Assessor, Hillshade, Bathymetry, Railroads, Roads, contours, watercourse” Aerials

Assessor Data
Bathymetry
Ortho Photos (aerial)
Port Gardner Bathymetry 20ft contour
Railroad
Roads
Watercourse
West 5ft Contour (hill-shade)

Disc 2 “Marine Habitat Data, References, Oblique Photos, Historical Photos”
Historical photos from 1947-1991
GIS Layers
Intertidal Substrate
Substrate type
Vegetation type
Some info on armoring
Streams
Marine Habitat
Bank/Bluff Slope Stability
Bathymetric Contours
Marine Riparian Vegetation
Shrub
Ornamental
Trees
Drift Cells
Snohomish County
And Washington state
King County Shore type
Feeder Bluff Exceptional, Feeder Bluff, Transport Zone, Modified, Modified-by the Burlington Northern Santa Fe Railroad (BNSF RR), Accretion Shoreform, and No Appreciable Drift.
Marine Wildlife
Dungeness crab area (polygons)
Dungeness crab buoys (points)
Forage Fish
Potential habitat
Known herring spawning areas
Known surf smelt spawning areas
Known sand lance spawning area
Rockfish
Points
Salmon
Juvenile Salmon Habitat Restoration Conservation potential
Shellfish Polygons
Geoduck
Hardshell Clams
Shrimp

Subtidal Clams
Nearshore Habitat Surveys
Eelgrass
Snohomish County from WDNR segments
Tulalip/Stillaguamish Habitat Survey
Marine outfall siting study (MOSS)
Substrate
Vegetation
Study area
Snohomish County marine Shoreline inventory
Armoring
NOAA Substrate Grabs
Marine Resource Management
Ferry Routes
Shoreline photos
Tulalip Reservation Boundary
Waste water treatment plants
Coastal Parks
Everett
Mukilteo
Shellfish Management
Commercial crab harvest limit area
Commercial shellfish growing areas
2006 and 2007
Crustacean management region
Marine Fish/Shellfish Catch reporting areas
Recreational shellfish beaches
WDFW Regulation areas
MSA Candidate Sites
Kayak Point Restoration
Beach
Fire pits
Garbage cans
Piers
Roads
Shelters
Signs
Trees
Oblique shoreline photos

Disc 3 “Landsat Data, PSNERP Data”

Landsat
Armoring
Invasive
Pier

Pipe point
Ram
Seep
Stream
Wetlands

PSNERP
Reports - PDFs

Island County GIS Data Inventory

From Karen Stewart, Island County SMP Coordinator k.stewart@co.island.wa.us

Dataset	Source (Date)	Data Gap (Y/N)
Air Photo	Express View (0.5 Ft) (2007); NAIP, USDA (1M) (2009)	N
Algal Community	WDFW (2008)	N
Aquifer Recharge	NA	N
Armoring	PSNERP (2008)	N
Bathymetry	PSLC (2008)	N
Bulkhead/Seawall	County (2009)	N
City Boundaries	County (2009)	N
Concrete Outfalls	County (2009)	N
Contaminated and Leaking Underground Storage Sites	Ecology (2010)	N
Contour Lines (5')	County (2010)	N
County Boundary	WDNR (2004)	N
Cultural Resource Inventory	County (TBD)	Y
Culverts	County (2006)	N
Current Land Use	County (2010)	N
Degradation (Nearshore Processes)	PSNERP (2010)	N
DEM Data (30m)	WDNR (2002)	N
Drainage Basins	PSNERP (2009)	N
Drift Cells	PSNERP (2010)	N
Dungeness Crab	WDNR (2008)	N
Ebey's National Historical Reserve	County (2010), ESRI (2001)	N
Ecology Watershed Characterization	Ecology (2010)	N
Eelgrass	WDFW (2008)	N
Existing Shoreline Planning Area	County (2010)	N
Feeder Bluffs	Coastal Geologic Services (2005)	N
FEMA Q3 flood	County (2010), FEMA (1996)	N
Ferry Routes	WSDOT (1999)	N
Ferry Terminals	WSDOT (2007)	N
Future Land Use (Comprehensive Plan)	*Zoning Used as Proxy	N

GAP Level III	GAP Northwest (USGS) (2004)	N
General Areas (Shoreline Inventory)	County (2009)	N
Geoduck	WDFW (2008)	N
Geology	WDNR (2004)	N
Hardshell Clam	WDNR (2008)	N
Historic Resource Inventory	WAHP (2010)	N
Impervious Surface (25 m)	NLCD (2001)	N
Jetty/Groin	County (2009), PSNERP (2006)	N
Kelp	WDNR (2008)	N
Land Cover	CCAP (NOAA) (2006); GAP (2009)	N
Launch/Ramp	County (2009)	N
LiDAR	PSLC (2008)	N
Metal Outfalls	County (2009)	N
Metal Stairs	County (2009)	N
Miscellaneous Features (Shoreline Inventory)	County (2009)	N
Oblique Photos	WA Dept Ecology (1993)	N
Other Outfalls	County (2009)	N
Outfalls (Manmade, Natural, CSO)	People For Puget Sound (2009)	N
Overwater Structures (Lakes)	WDNR (2006)	N
Overwater Structures (Marine)	PSNERP (2006), WDNR (2006)	N
Parcels	County (2010)	N
Parks & Open Space (Federal)	WDNR (2005)	N
Parks & Open Space (Municipal and County)	**County (TBD)**	**Y**
Parks & Open Space (State)	WDNR (2005)	N
Pier/Doc	County (2009)	N
Plastic Outfalls	County (2009)	N
Priority Habitat and Species (Polygons)	WDFW (2008)	N
PSNERP Strategic Needs Assessment (SNAR)	PSNERP (2010)	N
Public Access	County (TBD), Ecology (2010)	N
Roads	County (2006)	N
Sand Lance	WDFW (2008)	N
Seismic Hazard	NA	N
Septic Tanks	WA Dept Health (2007)	N
Sewer Lines	County (TBD)	Y
Shellfish Beaches	DOH (2010)	N
Shellfish Growing Areas	DOH (2010)	N
Shoreform	PSNERP (2010), WDNR (2008)	N
Shoreline Slope Stability	Ecology (1975)	N
Shorezone Data (OHWM - Marine Shoreline)	WDNR (2005)	N
SSURGO soil mapping (1:24k scale)	NRCS (USDA) (2010)	N
Steep Slopes (> 40%)	WDNR (2010)	N

Stormwater Datasets	County (TBD)	Y
Stream Centerlines	County (2010), WNDR (2008)	N
Trails	County (TBD)	Y
Tribal Lands	WDNR (2005)	N
UGA Boundaries	County (2010)	N
Utility Lines (Natural Gas, Petroleum, Jet Fuel, etc.)	County (TBD)	Y
Water Quality Assessment	WA Dept Ecology (2004)	N
Waterbodies	County (2010), WNDR (2008)	N
Watersheds/WRIA (Water Resource Inventory Area)	Ecology (2000)	N
Wetlands (Current)	Island County (2009), NWI (1989), PSNERP(2009)	N
Wetlands (Historic)	PSNERP(2009)	N
Wood Stairs	County (2009)	N
Zoning	Island County (2006)	N

Appendix F: Port Susan MSA Workshops and meetings

Date	Type of Meeting	Topic(s)
January 27, 2010	Science Workshop	Develop targets and viability
July 29, 2010	Advisory Team Meeting	Project logistics, threats workshop planning, citizen science
August 25, 2010	Core Team Meeting	Viability table, background
September 20, 2010	Core and Advisory Team Meetings	Threats workshop planning
September 28, 2010	Agriculture Outreach Meeting	Introductory meeting with Ag reps from Snohomish County
October 12, 2010	Core and Advisory Team Meetings	Threats workshop planning
October 19-20, 2010	CAP Threats Workshop	Threats to the Port Susan ecosystem
November 9, 2010	Core and Advisory Team Meetings	Threats workshop re-cap, citizen science, citizen workshops
December 16, 2010	Core and Advisory Team Meetings	Citizen workshops, citizen science, strategies workshop
January 10, 2011	Core and Advisory Team Meetings	Strategies workshop, citizen workshops,
January 25, 2011	Camano Island Citizen Workshop	Feedback on Conservation Target Health and Threats
January 27, 2011	Stanwood Citizen Workshop	Feedback on Conservation Target Health and Threats
February 9, 2011	Core and Advisory Team Meetings	Strategies workshop, outreach
February 22, 2011	Agriculture Outreach Meeting	Meet with Tristan Klesik (Klesik Family Farms) to update on project status
February 24, 2011	Agriculture Outreach Meeting	Meet with Betsy Christianson (Marine View Farms) to update on project status
March 8, 2011	Core and Advisory Team Meetings	Strategies workshop, citizen science,
March 14, 2011	Agriculture Outreach Meeting	Discussion of importance of including agriculture community and personal invitation to key figures in the Ag community to attend upcoming strategies workshop
March 24, 2011	Presentation to Stillaguamish Clean Water District Advisory Board	Update on project status
April 1, 2011	Agriculture Outreach Meeting	Follow up with agriculture representatives after workshop
March 30-31, 2011	CAP Strategies Workshop	Management strategies for the Port Susan ecosystem
April 12, 2011	Core and Advisory Team Meetings	Strategies workshop outputs, aquatic reserve
May 9, 2011	Core and Advisory Team Meetings	Citizen workshops, logistics, citizen science, bivalves
May 16, 2011	Educational Outreach	Presentation on Port Susan MSA to class at the UW School of Marine and Environmental Affairs
June 7, 2011	Educational Outreach	Citizen science data collection training
June 14, 2011	Core and Advisory Team Meetings	Citizen workshops, results chains, citizen science
July 6, 2011	Agriculture Outreach	Meet with key persons at Snohomish County to

	Meeting	commit to presenting to Ag board
July 11, 2011	Kayak Point Citizen Workshop	Feedback on Conservation Strategies
July 12, 2011	Island County Citizen Workshop	Feedback on Conservation Strategies
August 3, 2011	Advisory Team Meeting	Strategies synthesis and review, MSA process, citizen workshops, outreach, citizen science
September 13, 2011	Advisory Team Meeting	Embedded Invertebrates, strategies review/support, Sustainable Lands Strategy
September 27, 2011	Educational Outreach	Presentation of project status at Beach Watchers training
October 10, 2011	Embedded Invertebrates Workshop	Finalize target description and develop strategies
October 27, 2011	Presentation to the Salish Sea Conference	Port Susan MSA presented to a broad audience of regional conservation practitioners
November 17, 2011	Presentation to Stillaguamish Clean Water District Advisory Board	Update on project status
December 13, 2011	Advisory Team Meeting	MRC approval of Port Susan MSA CAP
February 14, 2012	Advisory Team Meeting	MSA process 2012, Citizen Science outputs, ECO Net/TAG grants
April 10, 2012	Advisory Team Meeting	Framework for Phase II of the MSA Plan, Advisory Team Membership
May 8, 2012	Advisory Team Meeting	Clarify roles, medium priority strategies, Port Susan slogans and outreach messages
June 12, 2012	Advisory Team Meeting	Overview of WSU Snohomish County Extension, shoreline armoring prevention grant, Measures and Workplan workshop
July 10, 2012	Advisory Team Meeting	Overview of Snohomish Conservation District, signs in Port Susan, Measures and Workplan workshop
August 14, 2012	Advisory Team Meeting	Developing Measures presentation, partner meetings
September 11, 2012	Advisory Team Meeting	Port Susan MSA CAP Measures
October 2, 2012	CAP Measures and Workplan Workshop	Management Action Steps and Measures for Port Susan
October 3, 2012	Partner Meeting Snohomish County SWM	Feedback on Conservation Strategies and Action Steps
October 3, 2012	Partner Meeting Snohomish County PDS	Feedback on Conservation Strategies and Action Steps
October 4, 1012	Partner Meeting Island County	Feedback on Conservation Strategies and Action Steps
October 4, 1012	Partner Meeting Snohomish Conservation District	Feedback on Conservation Strategies and Action Steps
October 9, 2012	Advisory Team Meeting	Measures and Workplan workshop and partner meetings outputs
October 25, 2012	Partner Meeting Ann Bylin (Stillaguamish Watershed Council) and Peggy Campbell Native Plants Program)	Port Susan MSA update
November 13, 2012	Partner Meeting WSU Snohomish County Extension	Feedback on Workplan and Measures Plan
November 15, 2012	Presentation to	Update on project status

	Stillaguamish Clean Water District Advisory Board	
December 7, 2012	Partner Meeting Tim Walls and Steve Britsch (Snohomish County)	Workplan comments
December 10, 2012	Partner Meeting Snohomish County PDS	Workplan comments
December 18, 2012	Advisory Team Meeting	Port Susan MSA CAP Phase II

Appendix G: Technical Review of Strategies

Target	Obj/SA #	Comments	Reviewer	Reviewer organization
Beaches/ Forage Fish	Obj1 SA1	WDFW Habitat Program and Marine Resources Division staff should also be able to comment on the needs and short-comings of the SMP, if any.	Dan Penttila	Salish Sea Biological
Beaches/ Forage Fish	Obj1 SA1	As far as I am aware, the People for Puget Sound staff does not have sufficient familiarity with the forage fish species and their critical habitats of the Port Susan region, as might pertain to informing anyone of the SMP or its importance to the maintenance of the considerable forage fish resources within Port Susan. WDFW staff and/or knowledgeable consultants should be assigned that task.	Dan Penttila	Salish Sea Biological
Beaches/ Forage Fish	Obj1 SA3	It is unlikely that the MRCs have sufficient in-house expertise in forage fish spawning ecology and habitat requirements, impacts of shoreline armoring, or soft-shore armoring techniques to conduct workshops, especially before a potentially skeptical audience. The staff of Coastal Geologic Services, Bellingham, WA, would be well-versed in soft-shore engineering, and have considerable experience in conducting public workshops on such matters.	Dan Penttila	Salish Sea Biological
Beaches/ Forage Fish	Obj 1 SA5	The "changing of permit requirements" will have to include administrative/legislative changes in the attitude and approach of the WDFW Habitat Program, whose HPA-permitting field staff presently consider that their "hands are tied" legally or by policies that supposedly prohibit them from denying any armoring HPA outright, thus leading to the continued proliferation of hard-armoring structures in the Port Susan/Camano Island region, even on feeder bluffs and documented forage fish spawning sites.	Dan Penttila	Salish Sea Biological
Beaches/ Forage Fish	Obj 1 SA5	In my opinion, WDNR (and WDFW) staff should not be conducting educational workshops for other employees to verify knowledge of armoring impacts, etc. Rather they should be attending such workshops themselves, being delivered by others with soft-shore engineering and forage fish expertise, who have the resources' best interests in mind, rather than "trying to be everyone's friend" and abrogating their resource/habitat-protection responsibilities, for fear of making someone angry and losing yet more shore of the dwindling state budget.	Dan Penttila	Salish Sea Biological
Chinook	Obj2 SA3	Would it also be beneficial to offer financial incentives to reduce impact, wealth may simply pay the fee and the function is lost. Assure the fees go to restoring lost function	Bill Blake	Stillaguamish Watershed Council

Chinook	Obj 1SA1	Specify "Snohomish" conservation district; Change 2013 to 2015	Monte Marti	Snohomish Conservation District
Chinook	Obj1 SA2	Not just agri-chemicals, but all chemicals as is stated: commercial/residential	Monte Marti	Snohomish Conservation District
Chinook	Obj1 SA2	Add a new Action step: 3. Snohomish Conservation District should seek funding to address weed management and the implementation of best management practices; thus reducing the quantity of weeds and the subsequent use of chemicals.	Monte Marti	Snohomish Conservation District
Chinook	Obj 1/SA 1	Delete: "...with the goal of spending $160,000 of Clean Water District discretionary funds by 2013." This allocation of Discretionary Fund has not been recommended by the CWD Advisory Board nor approved by SWM.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Chinook	Obj 1/SA 1	Under Action Step 1, revise: "Conservation District and CWD meet to prioritize funding projects" as follows: "CWD Advisory Board continue to advise SCD and SWM on farm project priorities."	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Chinook	Obj 1/SA 1	Delete "small" from "small farms"	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Chinook	Obj 1/SA 2	Add lead in statement to "continue Mussel Watch program."	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Chinook	Obj2	Commercial and Residential are normally in UGA, need reference target UGA programs	Bill Blake	Stillaguamish Watershed Council
Delta	Obj 2	Have Stillaguamish TAG confirm acreage number of 950	Bill Blake	Stillaguamish Watershed Council
Delta	Obj1 (SA2)	I'm not a storm water expert, but the way this reads, it implies that all the pollutants that come with storm water will be carried out to the bay. If this is the intent, aren't we saying we want to use the bay as the receptacle for a whole bunch of toxicants? This might read better if you include a line that says the objective is to return clean water back to the bay through these methods?	Ruth Milner	WDFW
Delta	Obj2	I'm confused again. By storm water, do you mean flood water? Perhaps, for this entire section you could add a glossary, so we know exactly what the terms mean in this context. I can't figure out if we are reducing toxicants, or water on farm lands from the way this is written.	Ruth Milner	WDFW
Delta	Obj2 SA1	Include the Conservation district in action steps: 1, 5 and 6	Monte Marti	Snohomish Conservation District

Delta	Obj2 SA2	Include the Conservation District in action step # 3	Monte Marti	Snohomish Conservation District
Delta	Obj2	Objective 2 under Target: Delta refers to consistency with “salmon recovery plan of restoring 950 acres of estuarine area by 2040.” This is restated under Strategic Action 1 under Objective 1 under Target: Shorebirds as a goal to “restore a portion of delta habitat (overall goal is 959 acres).” I reviewed the salmon recovery plan and did not see this. What I did see were ten year goals for estuary habitat 195 acres of restoration and 120 acres of creation for a total of 315 acres. Also, I found 50 year goals that total 1705 acres of combined restoration and creation. It may be beneficial to help the reader/reviewer/participant understand where the specific numbers come from.	Michael Purser	Snohomish County
Delta	Obj 1/SA 3	Delete: "...in partnership with the Clean Water District," because the CWD is not an action agency and Sno. Co. does not need the CWD Advisory Board's approval or recommendation to implement this strategic action.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Delta	Obj 2/ SA 1	Recommend that Snohomish Conservation District take the lead with their LID Specialist on actions related to Stanwood stormwater management rather than Snohomish County and CWD. Sean and Kathleen need to vet the proposed Snohomish County action steps 1, 2, and 3 with their supervisor Gregg Farris. Per the general comments above, defer resolution of detailed action steps to 2012.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Delta	Obj 1 & 2	Distinguish between new development and old development for LID and retrofits.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Delta	Obj 2/SA 1	Stormwater strategies should also be applied to other Stilly watershed cities.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Delta	Obj 3	Recommend adding strategic action to promote local healthy seafood production, including salmon, clams, and crustaceans.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Delta	Obj 4	Recommend coordinating this objective with Stillaguamish River Flood Control District, Sustainable Lands Strategy (SLS), and Stillaguamish Technical Advisory Group (STAG).	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Delta / Shorebirds		Do we have science that says we want more freshwater inputs to the estuary? I'm thinking about shorebirds, who feed there because of	Ruth Milner	WDFW

		invertebrates who live there because of substrate and salinity.		
Embedded Inverts		In the "Strategies" section, under the "Incompatible Harvest" threat, the target year for Objective 1 is 2016, but the Strategic Actions and Action Steps have target years of 2015. Should the target year for Objective 1 also be 2015?	Sean Edwards	Snohomish County
Embedded Inverts		Under the "Ocean Acidification" threat, Strategic Action 1, I don't recall any group decision to include the action step to "develop a citizen science effort to implement an early warning pH monitoring system." Maybe I missed that part of the discussion.	Sean Edwards	Snohomish County
Embedded Inverts		Under the "Ocean Acidification" threat, Strategic Action 2, I think it is important to recognize that the existing Stillaguamish Salmon Recovery Plan assumes that restoration of estuarine vegetation will occur through natural regeneration, which would follow restoration of tidal influence rather than through active planting of estuarine plants. So I'm not sure there is a need for nursery production of estuarine plants. This should be discussed with SWM Native Plant Steward Scott Moore and the Stillaguamish Technical Advisory Group for salmon recovery.	Sean Edwards	Snohomish County
Embedded Inverts		Page 1 Landscape context. I thought we deleted "percent of natural shoreline immediately adjacent to the documented clam beds" for all the reasons described in the first paragraph on page 2. If we did keep it, I don't think the explanation on page 2 says why.	Mary Cunningham	Snohomish MRC
Embedded Inverts		Page 1, paragraph 2. 4th sentence. The beaches target is an appropriate location for the native littleneck because of its importance in maintaining the health of the shoreline, and subsequently native littleneck beds. First, the word "its" was confusing since I wasn't sure if it was referring to the beaches target or the littleneck. And rather than the beaches target maintaining the health of the shoreline, is it the habitat forming processes that create beaches that are important to forming habitat for native littleneck beds? It would help me to have a little more info about how beaches relate to the littleneck beds. Are littleneck beds found within or adjacent to beaches?	Mary Cunningham	Snohomish MRC
Embedded Inverts		Page 2 1st paragraph - It would be nice to include that the discrete beds for native littlenecks are in coarser sediments and in more saline areas than habitat for the Eastern soft shell.	Mary Cunningham	Snohomish MRC

General		Important to provide map of stewardship area the recommendations apply to. A variety of the recommendations may be hard to show direct impact to Port Susan if done significantly upstream. For instance the exempt well recommendation if done in Verlot or Oso may cause the proposal to be challenged unnecessarily	Bill Blake	Stillaguamish Watershed Council
General		There is some great specificity of actions for many Strategies, Objectives, and Targets that is missing in many other plans. Other plans tend to jump to the identification of "projects" or allude to future processes, with few specifics. The strength of this synthesis is in the specifics.	Michael Purser	Snohomish County
General		What is the process for vetting these Targets, Objectives, and Actions with those decision-makers and purse-holders who will fund these efforts?	Michael Purser	Snohomish County
General		While it is noted that Opportunities are ranked, what about likelihood or difficulty? If these actions were easy it seems that they would already have been done. Some of this is low-hanging fruit, others are pie-in-sky and a few are in the middle. Some recognition of level of difficulty or likelihood up front would possibly head off the dismissal of some Actions as "unrealistic."	Michael Purser	Snohomish County
General		A question that is sure to come up is that of sequencing. Are there Actions that must take place first?	Michael Purser	Snohomish County
General		It is challenging to maintain continuity of thought and fidelity to process at the current frequency of communication. There is a great desire to contribute substantively and this is more likely when regular updates are distributed and feedback sought.	Michael Purser	Snohomish County
General		Identification of groups such as ECO Net, Earth Economics, and the small consortium of climate change "modelers" seems exclusive, rather than inclusive (btw, Battelle). Because they have been used before or because some people are allied with them, does not necessarily mean that they should be identified as the go to on specific Actions. Consider the use of citizen economists, citizen climate change modelers, etc. A challenge for every large scale planning effort I have seen or been involved in over the last 20 years has been to ward off the temptation to default to consultants or ivory towers and to be faithful to inclusion (i.e., dance with the folks what brung ya').	Michael Purser	Snohomish County

General	General	We support the concept and intent of the Port Susan MSA strategies, but the specific strategies need further refinement and vetting with technical experts and key stakeholders, such as the Sno. Co. Ag Board, Stillaguamish River Flood Control District, City of Stanwood, and Stillaguamish Technical Advisory Group. Need to establish realistic schedules based on political, regulatory, and economic realities.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
General	General	We support identifying responsible parties for action step implementation, but we would like to know whether the identified parties are confirmed.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
General	General	Many of the action items have no identified lead agency, but that is needed throughout the strategic plan. Recommend not including any of the specific "action steps" in the draft plan that you are working to complete by December 2011. Focus in 2012 on developing, refining, and vetting detailed action steps and funding commitments with the entities that are going to implement them.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
General	General	Under each target/objective, should reference existing efforts, such as derelict crab pot removal.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
General	General	Recommend that all of the targets, objectives, and strategic actions be reviewed with the Stillaguamish Technical Advisory Group.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
General		Interesting to see what we came up with now that some time has passed! We missed a key action to maintain marsh and mudflat health, which is to continue to control invasives. In looking at my data compared to counts done in the 1990's. I think I see a complete shift from birds that used Padilla Bay in the 1990's, when Spartina occupied much of Skagit, and I assume Port Susan, to now, where they hardly ever go to Padilla, presumably because the food sources are very rich in the Spartina control sites.	Ruth Milner	WDFW
General / Delta		The outline format could make it challenging for those new to the process to relate some Objectives to some Targets. For example, it may be difficult to directly relate “Encourage the local/organic food movement in Stillaguamish delta,” to Target: Delta. While Action Steps get their strength from their specificity, some appear unrelated to their Targets. For example, “WSU Extension and Snohomish Conservation District coordinate with Slow Food Port Susan’s mission to provide “good, clean, fair” food by contacting them and see how the MSA may line up with their work” for the Delta Target.	Michael Purser	Snohomish County

Shellfish	N/A	Recommend examination of toxic chemical levels in Port Susan bivalves, development of local shellfish consumption guidelines, and work to decrease toxin levels in shellfish.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Shellfish	N/A	Assess population structures for embedded invertebrate species and increase populations to sustainable and harvestable levels.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
Shorebirds	Obj 1/SA 1	"Battelle" is misspelled. Correction: "Battelle", but should verify.	Sean Edwards and CWD Advisory Board	CWD Advisory Board
General		explain the ECO acronym	Ruth Milner	WDFW
General		need to go back through the document and make sure all acronyms are explained. What is SMP? Perhaps, when creating a glossary, list and define all acronyms used in the document?	Ruth Milner	WDFW

Appendix H: Public Review of Strategies

This feedback was gathered as participants went around the room to five stations representing the targets, for a period of ten minutes each. In retrospect, more time at each station would have allowed participants to gain a more solid understanding of the process and provided for more nuanced exchange. Comments ranged from full support of strategies, to suggestions for improvement, to disagreement over the merits of some strategies. Below you will find a summary of comments received at both Island and Snohomish County workshops. The strategies listed below are as presented to the public in July of 2011. Since then, technical reviewers have made additional changes to strategies after the workshops.

Crustaceans

Objective 1: Maintain population structure by reducing take of undersize crabs.

Public Comment: Comments were largely in agreement that this strategy warrants action; additional concerns were expressed over the taking of soft-shell crab, the need to make people aware of regulations, returning undersized crabs gently to the water, and equality between treatment of commercial, recreational and tribal fisheries. There was a general recognition of the importance of education, and suggestions for increasing park rangers to monitor and educate. Finally, the need for accurate counts of existing stocks was mentioned.

Strategic Actions:
Implement an outreach plan to maintain good population structure and reduce loss of fishing gear

Public Comment: Several people commented that this strategic action is very similar to objective two, strategic action one, and that clarification of the difference is warranted. Two suggestions were given: to attach educational information directly to the license, and to have a way for citizens to report observed violations of commercial and recreational boats.

Track and standardize enforcement efforts

Public Comment: Participants were in agreement with the need for more enforcement and more staff, with the recognition that enforcement requires funding. Education was also suggested as an alternative, with enforcement as a secondary measure if education efforts are unsuccessful.

Objective 2: Reduce incidence of Dungeness by-catch mortality

Public Comment: Suggestions for this objective were to make licensure conditional on upgrading pots, and to develop educational materials for how to return undersize crab to the water without harming them.

Strategic Actions:
Implement comprehensive outreach plan to maintain good population structure and reduce loss of derelict gear

Public Comment: Participants recognized the importance of education, as well as the need for resources for education. However, there was some confusion over the differences between this strategic action and the previous outreach plan one, and clarification may be warranted in the future.

Conduct biennial crab pot removal in Port Susan and reduce new pot loss.

Public Comment: While there was some concern over the expense of implementing this strategic action, several suggestions were made as to how to address the costs of removal. One suggestion was to engage volunteer divers in this effort and include safety training. Another was to incentivize the labeling of pots with owner's names to get them back when recovered.

Shorebirds

Public Comment: Participants noted that they believe the southeast end of the delta near Kayak Point seems to be growing, and that Dunlin use logs at kayak point extensively at high tide.

Objective 1: Maintain quality and quantity of mudflats and intertidal marsh by allowing habitat migration in the face of sea level rise.

Public Comment: While some participants saw action in the face of sea level rise as essential, others expressed concern over the validity of the science predicting sea level rise and the merits of taking action in light of this opinion. There were also concerns over the difficulty of implementing this objective.

Strategic Actions:
Remove armoring in Delta areas with failing infrastructure and build set back dikes to restore a portion of habitat on agricultural lands.

Public Comment: Concerns over private property rights were expressed. In particular, ensuring the continued need for the goods and services provided by agriculture was mentioned, along with a fair economic resolution for use of agricultural lands in restoration projects. In this respect, cost (and who bears it) came into question.

Limit future development in floodplain migration area.

Public Comment: While some participants thought limiting development to be a critical and likely effective strategy, others expressed concerns over protecting private property rights. This was also mentioned as a possible political barrier to implementation.

Identify and protect existing unarmored shoreline.

Public Comment: Several participants suggested soft armoring as a viable alternative to traditional bulkheads. Education was suggested as a way to inform the public about problems

with bank hardening, and the potential long-term savings of soft armoring. Continued concerns over private property rights were expressed.

Objective 2: Orchestrate local, State, and Federal response to mitigate unintended damages from spill response related impacts to intertidal habitats.

Public Comment: One participant suggested that planning, supplies, training, and review are essential. Other comments were more cautious about devoting limited resources to an unlikely event, when there are more immediate problems that should be addressed, in their opinion.

Strategic Actions:
Ensure that Snohomish and Island Counties have trained and coordinated in response tactics to the standards/level of high-risk spill areas.

Public Comment: Responses were supportive overall, with several suggestions given. One participant mentioned that Island County does not have the equipment and manpower necessary to address oil spills, and therefore currently contracts with Snohomish County for emergency response. Another mentioned that agreement on best practices was needed. Finally, it was suggested that making small changes in training to ensure more environmentally friendly cleanup practice, was a good response to potential funding challenges.

Beaches/Forage Fish

Public Comment: A general question was posed about the threat of incompatible forestry. One participant wondered what the concern was, where this information is coming from, and in particular if it is commonly held expert opinion.

Objective 1: Protect remaining natural shoreline by encouraging 100% soft/green armoring.

Public Comment: Comments on this strategy were quite varied ranging from supportive to objecting. Many participants felt that a 100% standard was too high, while others expressed concern over protecting private property and doubts over the effectiveness of soft armoring. Suggestions included developing minimum design standards instead of the 100% measure, including this strategic action in the new Shoreline Master Programs, grandfathering in existing bulkheads, and ensuring the existing right to build a bulkhead is kept when all permits are granted.

Strategic Actions
Enhance Island County Shoreline Master Program regulations and Snohomish County enforcement.

Public Comment: Several suggestions were made regarding the specifics of enhancing regulations and enforcement. These included: educating the public, implementing flexible regulations to accommodate different types of shoreline, and developing alternatives to breaking levees.

Educate contractors, realtors, landowners, and engineers to encourage soft armoring.

Public Comment: Suggestions to implement this strategy included the creation of case histories of successful soft armoring projects, requiring a LID license for contractors, and providing landowner incentives for soft shore armoring. Some participants mentioned that some of these actions are already happening. One comment suggested regulation in addition to education.

Change permitting requirements to increase permitting standard for new or enhanced hard armoring.

Public Comment: Participants were less supportive of increasing permitting standards. Opposing comments included the sentiment that changing public opinion about private property will be unpopular and unlikely. Additionally, some participants thought that even current standards to secure a permit for armoring are too strict, and therefore making them stricter was unjust. However, several positive suggestions were made for facilitating implementation of this action in the face of public resistance. These included: grandfathering existing areas, having a flexible/tiered-permitting program, establishing minimum design standards for soft shore armoring, including permitting requirements as a regulation in the SMP, focusing on protecting undeveloped areas first, offering better solutions for high energy armoring, and having a demonstration site for soft shore armoring alternatives.

Objective 2: Enhance functionality of vegetative buffers through conservation and restoration.

Strategic Actions:
Restore buffers.

Public Comment: The only comment was that buffer restoration is very important.

Institute public and private incentives for tree and buffer protection.

Public Comment: People were supportive of the idea of incentives, and wanted more information on the specific types of incentives. Incentives that were suggested were providing tax breaks and planting materials, and combining such incentives with educational materials about shoreline stewardship. However confusion was expressed over how incentives fit in with current law.

Develop an education and outreach plan to enhance riparian buffers.

Public Comment: Participants suggested that education on how to treat riverbanks was important, as many people are not aware of problems with riparian buffers. Participants also inquired about what, if any, practices are currently underway for enhancing buffers. Concrete action, in addition to education, was suggested as a way to produce change.

Chinook

Objective 1: Remove project area waters from the Clean Water Act 303(d) list for fecal coliform and nutrients and prevent agri-chemicals from entering project waters.

Public Comment: There was a suggestion to add copper to this strategy, as an additional pollutant. One participant added that Island County is currently ahead of Snohomish County regarding septic system inspections and regulations.

Strategic Actions:
Create "whole package" message for small farm owners that includes education, available funds, and other resources or partners as necessary in order to reduce fecal and nutrient loads.

Public Comment: Participants suggested that this strategy would be more likely to succeed if incentives were included. Additionally, participants suggested that a "whole package" message and resources/materials should be incorporated into farm management plans.

Prevent introduction of any agri-chemicals into surface waters from commercial/residential landscaping.

Public Comment: Participants identified the pollution of surface waters as a very important issue, noting that it is too easy to use harmful chemicals in landscaping without considering ecological impacts; stricter product laws were suggested.

Increase all landowner awareness of environmental stewardship as it relates to water quality.

Objective 2: Encourage 90% of future growth in Urban Growth Areas (UGAs) to reduce cumulative impacts.

Public Comment: One comment called this a great objective, but expressed concern over the difficulties of implementing measures for limiting growth.

Strategic Actions:
Address vesting laws on prime fish lands through sun-setting or other mechanism

Public Comment: A definition of "prime fish lands" was requested. Political feasibility of changing vesting laws was questioned.

Revisit grandfathered non-conforming lots on Ag-10 zoned lands.

Public Comment: Political feasibility of revisiting grandfathered lands was questioned.

Local governments assess an impact fee by square footage of development, fill or impervious surface, to account for loss of ecosystem services.

Public Comment: While there was some disagreement over the merits of an impact fee, tiered fees were suggested (where greener development gets lower fees). One participant suggested that

other than development, most types of land use are not profitable, so there is little incentive for other uses. More specifically, estate taxes are currently based on "best use" which is almost always development; even transfer of development rights or conservation easements do not offer values comparable to development. Thus, the market for these uses needs to be more competitive with development interests. Approval of fees in the current economic climate was questioned, with incentives suggested as an alternative.

Outside of the Urban Growth Area, limit future growth by making access to residential water stricter by closing sensitive basins (where water rights are already over appropriated) to future exempt wells.

Public Comment: Participants suggested that landowners would be against stricter growth provisions, and currently have the law on their side.

River Delta

Objective 1: Increase Delta complexity, improve flood conveyance, and increase agriculture productivity by creating a restoration project that increases freshwater inputs to the mudflats between South Pass and Hat Slough.

Public Comment: Participants were in favor of improving flows as a way of "letting nature take its course." Participants also expressed concerns about how the agricultural community will react to this strategy.

Strategic Actions:
Develop agreements and incentives for landowners to redistribute stormwater into new channels on their land.

Public Comment: One participant suggested that in developing agreements and incentives, it would be appropriate to start with best management practices.

Design and build new channels that act like delta tributaries in storm events.

Improve Best Management Practices in new channel drainage areas to meet all Department of Ecology water quality regulations.

Public Comment: There was confusion expressed over the need to meet DOE regulations; participants assumed regulations were already being met and therefore should not require improvement.

Objective 2: Reduce the delivery of local stormwater to the delta to accommodate more productive agriculture that allows farmers to return a portion of their land to natural functioning (either buffer or marsh).

Strategic Actions:
City of Stanwood and Snohomish County solidify wetland protection, connection and restoration components of comprehensive plans to decrease flood runoff to agriculture fields.

Public Comment: One participant suggested that there is a need to address chemicals used by farms.

Retrofit Stanwood developments with Low Impact Development Techniques (LID).

Public Comment: Concerns over the cost of LID were expressed.

Objective 3: Encourage the local/organic food movement in the Stillaguamish Delta.

Public Comment: One comment suggested that a local/organic food movement might already be underway voluntarily through local farmer efforts.

Strategic Actions:
Connect Snohomish farm incubator (hands on training center including classes on regulations and ecosystem process) graduates with Stillaguamish properties through Farm Link to encourage incoming farmers to promote stewardship and environmentally friendly productivity techniques.

Public Comment: One participant commented that there are many potential benefits to this strategy, as farmland can be a big part of the solution.

Conduct outreach activities to teach environmental stewardship and productivity techniques for farmers to respond to growing demand for locally produced organic food with good environmental stewardship, and increase overall profitability.

Public Comment: To further increase the demand for local goods, and thus the potential for agricultural profits from those goods, one participant suggested encouraging grocery store chains to sell local products.

Objective 4: In areas that have degraded flood protections infrastructure, construct set back dikes that ensure that fields behind the setbacks will be better protected and return a portion of the original property to tidal marsh.

Strategic Actions:
Evaluate areas with high salinity due to frequent tidally influenced river flooding.

Construct set back dikes that protect property.

Restore areas on the waterward side of the dike

STRATEGY SUGGESTIONS

At each workshop, participants were also given the opportunity to provide suggestions for new strategies with written comment. Below is an overview of comments received at both Island and Snohomish County workshops.

Crustaceans
The crustaceans target had the most strategy suggestions contributed. Many people voiced concern over the use of unleaded floating polyethylene line, as it is easily cut by passing boats and can lead to derelict gear. Thus, regulation and enforcement of line standards was suggested. Additional enforcement was suggested to deter illegal catch practices, such as the seizure of/fining for crab pots that are found to be defective or illegal. Alternatives to enforcement were also suggested. For instance, education of citizens about the potential harm that can be caused by forcefully throwing back undersized and/or female crabs that cannot be kept, to encourage more gentle protective methods. Another suggestion was to make commercial regulations more readily available. A completely different strategy direction was also suggested: to increase the focus on improving viability by protecting/restoring habitat and eelgrass beds, rather than focusing completely on threat abatement.

Shorebirds
Strategy suggestions for shorebirds included supporting TNC's efforts in watershed restoration upriver, and increased assessment of populations to identify species at risk. Education of elected officials, children, and local households about shorebirds, as well as the effective engagement of volunteers was suggested. Finally, one participant called for stricter permitting regulations for shoreline armoring, as in their opinion, voluntary measures won't achieve results.

Beaches/Forage Fish
One participant suggested that soft armoring could be achieved with the use of stumps from forest clearing.

General Suggestions
In addition to target specific strategy suggestions, a number of general comments were also received. Most of these had to do with educating and engaging the public. For instance the idea that if volunteers were engaged in smaller, more manageable tasks, more people would be likely to volunteer that otherwise could not commit to a large project. A general increase in awareness of the threats and strategies throughout Port Susan was suggested so that everyone can take small steps toward improving water quality. For instance, a statewide curriculum could be developed around issues in Port Susan that apply more widely, so that the expense of education can be shared.

Appendix I: Citizen Science Project Summary

Port Susan Marine Stewardship Area Citizen Science Project
Final Report

December 2011

Prepared by
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Submitted to Snohomish County Marine Resources Committee and
the Northwest Straits Commission

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Introduction

The 2011 Port Susan Marine Stewardship Area (MSA) planning process included a complementary citizen science component designed to engage community members in the Port Susan area and fill data gaps in the viability and threat assessments. Involvement in citizen science projects has been shown to increase knowledge, awareness and sense of place of participants, and affect behavior change (Brossard et al. 2005, Evans et al. 2005). Beyond education, citizen scientists have a desire and the ability to contribute to real, meaningful, and important scientific studies (Evans et al. 2005, COASST unpublished data, COSEE-OLC unpublished data).

As part of a conservation action planning process conducted during the Port Susan MSA project, focal targets, key ecological attributes, and indicators for Port Susan were selected at a science workshop in January 2010 and threats to the system identified in 2011. While data and information are available for some of these selected indicators and threats, data gaps were also identified.

There is a history of citizen science in Port Susan for at least twenty years, including shorebird and intertidal biota abundance and diversity, eelgrass underwater mapping, substrate conditions, shoreline armoring characterization and more. Washington State University Extension (WSU) Beach Watchers have been the primary organization coordinating and gathering citizen science data in the area.

Building on this history and the Port Susan MSA conservation action planning process, citizen science was identified as an opportunity for filling data gaps while engaging, educating and enhancing stewardship in local communities. Citizen science project objectives included:

Produce a comprehensive inventory of citizen science projects that have taken place in Port Susan in the last ten years;
Identify data gaps in the viability and threat assessments that are suitable for citizen science contribution;
Develop citizen science monitoring protocols and volunteer training modules for one citizen science project;
Recruit, train and coordinate volunteers for this project; and
Provide citizen science data to enable updates to the viability analysis.

Port Susan Citizen Science Inventory

WSU Snohomish and Island County Extension Beach Watchers (WSU) and Washington Sea Grant (WSG) completed the inventory of current and recent historical citizen science projects in the Port Susan area (Appendix A). Port Susan MSA project partners were surveyed for information on local citizen science projects, literature and web searches were conducted, and citizen science project staff were contacted to verify project information. Along with basic contact information and a project description, the

inventory includes information such as the type of data collected, sampling locations and frequency, and the availability of written protocols and data. The inventory was used to inform assessment of Port Susan data gaps for citizen science project selection and development.

Citizen Science Project Selection

Decision Summary:
Based on the Port Susan MSA Advisory Committee's review and approval of the recommendation in the December 16, 2010 decision document (Appendix B), as well as new information provided by Washington Department of Fish and Wildlife and the Port Susan Advisory Team in Spring 2011, the WSG and WSU Beach Watchers moved forward with developing an upper intertidal assessment project including:
adjacent land use and backshore type,
shoreline armoring and associated structures, and
marine riparian shade.

The Port Susan MSA Core Team approved a prioritization of nearshore habitat type over estuarine habitat in spring 2011, based on volunteer access, safety issues and relevance to the data parameters selected.

Citizen Science Project Protocol Development

Methods and protocols were compiled from ten previous studies in Port Susan and greater Puget Sound. Elements of these studies related to the Port Susan MSA citizen science project were assessed to inform protocol design for and ensure greatest data compatibility. Protocol concepts were developed and presented informally to experts at the Port Susan MSA Strategies Workshop at the end of March 2011 as well as through individual consultation via phone and email. Based on this feedback, draft protocols were developed for testing.
WSG and WSU Extension Beach Watchers staff conducted initial protocol testing in the field. Revisions were incorporated and final field-testing occurred during the volunteer training session and by a volunteer team the week following the training session. Final instructions and data forms were distributed to volunteers on June 23, 2011 (Appendix C and D).

Volunteer Training (Formal and Supplemental)

On June 7, 2011, a training was held for WSU Extension Beach Watchers and volunteers at the North County Fire Hall, Stanwood and Kayak Point County Park. Advance registration of 25 WSU Extension Beach Watchers was sufficient to fill the training venue therefore further recruitment was limited to MRC and Port Susan MSA project members only. Total training attendance was 26, with the group split in half between representatives from Snohomish and Island County.

The training provided background information on Port Susan and the importance of the MSA project, and how citizen science data collection will feed back into the work of the Port Susan MSA to benefit the ecosystem and the community. Training included both a classroom portion (North County Fire Hall) and a hands-on outdoor training (Kayak Point) where volunteers were able to work through the data collection methods and data sheets. This portion was interactive with volunteers taking ownership and making suggestions for improving collection methods. The training agenda is provided in Appendix E.

Feedback was largely positive, despite heavy rain that precluded photos from being taken. Because changes were made based on the original training session, a volunteer team was recruited to test the revised protocols prior to full project implementation. Another refresher training was offered by WSU Extension Beach Watchers on Cavalero Beach (Camano).

Survey Results

Nearly 12 (11.9 miles / 62,694 feet) of Port Susan were surveyed in between June 26 and October 3, 2011 on days that followed +9 to +11 tides. Twenty three surveys were completed by seventeen people (65% of trainees) in teams of 2 – 3 volunteers. Completed surveys cover more than 50% of the accessible shoreline (i.e., not including the delta area) with 75% and 40% of the Snohomish County and Camano Island regions of Port Susan covered, respectively. A small group of dedicated volunteers in Snohomish County did multiple surveys while Island County volunteers were beset by health and family issues throughout the survey period. WSU Extension Beach Watchers volunteers donated a minimum of 200 hours during this survey work.

Preliminary Data Summary

Data are provided in Appendix F. Results and analyses provided here are preliminary. Further analyses will be completed in early 2012. *Please contact project staff for the most up-to-date results before using or circulating this information.*

Marine Riparian Shade

At random intervals and locations where volunteers felt a significant change had occurred in marine riparian canopy, data was collected on the observed canopy. Overall, the average canopy for all surveyed areas was 30.9%. With 303 records, there was an average of 25.5 canopy measurements per mile surveyed. Table 1 shows the percent coverage of canopy in each county and for all surveyed area.

Table 1: Percent coverage marine riparian canopy along accessible shoreline of the Port Susan area in 2011.

Cover Class	Percent of Snohomish County Survey Area	Percent of Island County Survey Area	Percent of Total Area Surveyed
Trace (0-.5%)	4	56.4	21.4
.5 – 6%	4	6.9	4.9
6-26%	28.2	18.8	25.4
26-50%	34.7	8.9	26.1
50-75%	14.9	4.9	11.6
75-95%	7.4	2	5.6
95-100%	6.4	2	4.9
Feet Surveyed	**35,747**	**26,947**	**62,694**
Miles Surveyed	**6.77**	**5.1**	**11.87**

There are twice as many marine riparian canopy data points for Snohomish County than Island County. The big differences in percent canopy may be indicative of true conditions or that Island County surveys were completed in more urbanized areas with easier access points. A large portion of the Snohomish County surveys were completed on tribal reservation land.

Not all volunteers recorded actual depth of canopy when it was overhanging the beach. Average canopy depth of all entries was 8 feet 5 inches. The greatest depth was 54.5. However, 60.2% of all recorded entries had no canopy overhanging the beach at all.

Shoreline Armoring and Adjacent Land Uses

Of the 62,694 feet surveyed, 5.6% of the area was not surveyed for structures (armored versus natural) and 7.8% was not surveyed for adjacent land use. This is likely due to the number of monitoring items to track and volunteers not realizing they had missed these data elements.

The distance with structures surveyed was 59,174 feet. Fifty-three percent (53%) of that area was without any type of observable structure. Forty-six percent (46%) had bulkheads continuously or with small interruptions such as ramp or stair entrances.

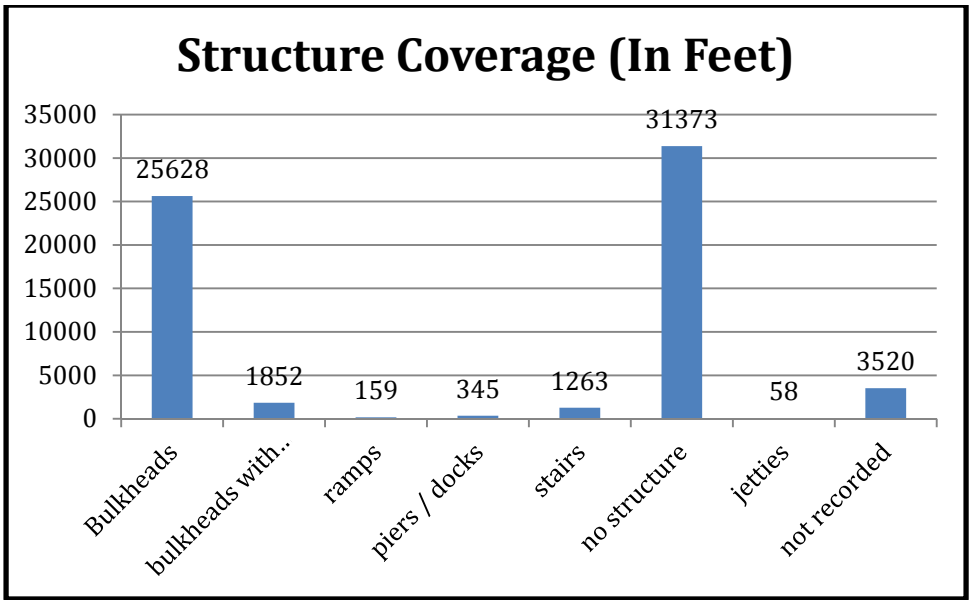

Figure 1: Number of feet for each type of structure noted along the accessible shoreline of Port Susan in 2011.

The following items were documented during surveys on 11.87 miles of Port Susan:
132 sets of stairs
26 ramps
38 jetties or groins
20 piers and docks

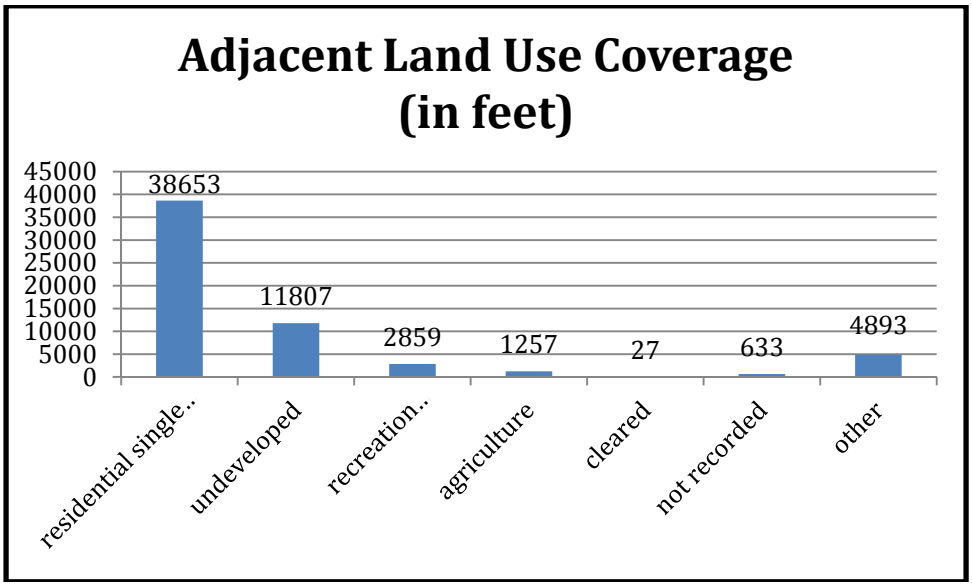

Figure 2: Number of feet for each type of adjacent land use along the accessible shoreline of Port Susan in 2011.

The predominant adjacent land use in areas surveyed is residential single family. There is over 11,000 feet of shoreline in this land use that currently does not have observable bulkheads as well as another 11,800 feet that is currently undeveloped.

Volunteer Evaluation

A project evaluation was distributed to all volunteers who attended the training (26 people) following completion of the project period. Volunteers were sent a link to an online evaluation via email, with at least one follow-up reminder email. The online evaluation was completed by 50% of recipients (13 people). Twelve of the 13 evaluation respondents had actually completed shoreline surveys during the project, which represents 70% of those volunteers that participated in the shoreline surveys. This report includes a short summary of evaluation results for those who completed shoreline surveys (N=12). Full evaluation information is available upon request.

Overall, volunteer evaluations were mixed. No respondents were extremely satisfied with their experience participating in the Port Susan shoreline monitoring project; however, 42% were very satisfied and an additional 25% were satisfied. Comments suggest that some volunteers were frustrated by the complexity of the data collection and some were concerned with surveying on private property in close proximity to houses (although all volunteers had permission for surveys on private property).

Despite the mixed satisfaction, 100% of respondents reported learning about the Port Susan MSA, the importance of shoreline habitat features, general shoreline issues in Puget Sound, and scientific surveys and data collection techniques (Figure 3). In addition, 100% of survey respondents reported gaining an increased connection to their local environment and more than 90% reported gaining an increased connection to other people in their community with similar interests, the research community, and the WSU Extension Beach Watchers program through participation in this project (Figure 4).

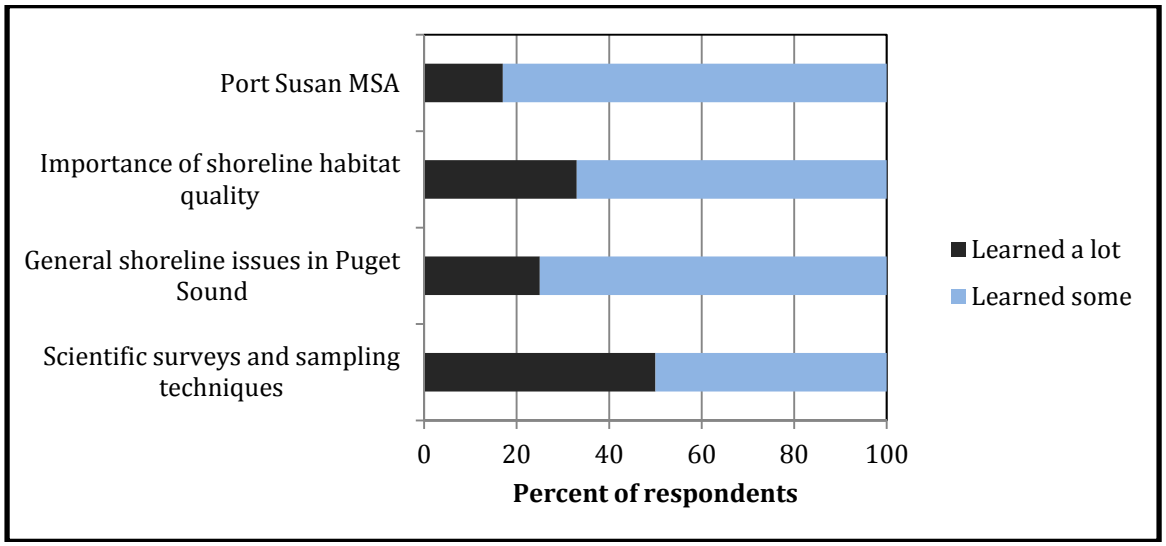

Figure 3. Port Susan upper beach assessment monitoring project volunteer evaluation – percent of respondents who reported learning about various topics through participation in the project.

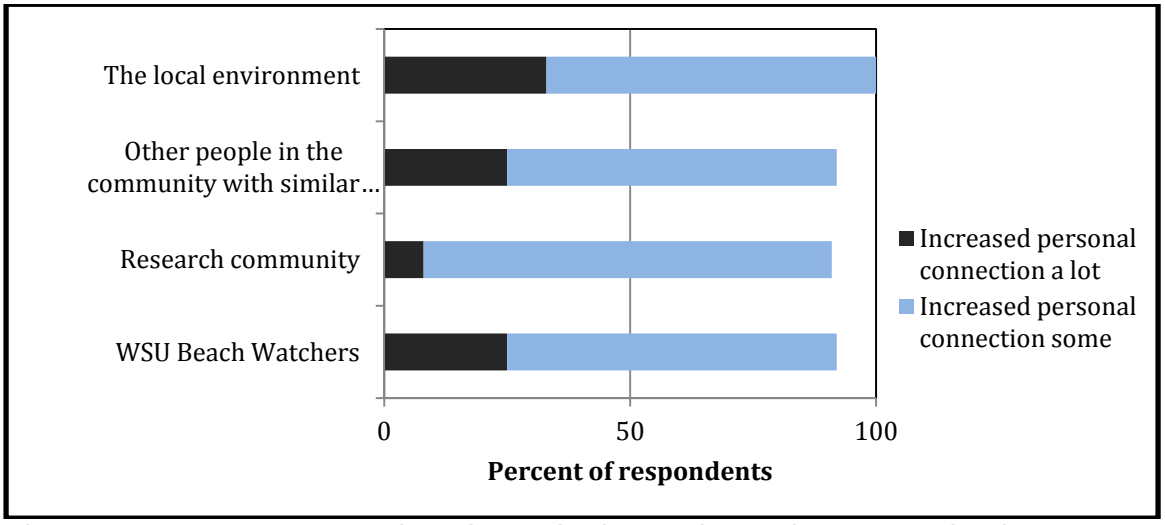

Figure 4. Port Susan upper beach monitoring project volunteer evaluation – percent of respondents who reported an increased personal connection to the environment and others as a result of participation in the project.

Even with mixed overall satisfaction, the project was successful in engaging volunteers in learning and increasing their personal connection to Port Susan. It perhaps can be said that the project was complex and challenging for volunteers, but they learned a lot through participating. Some volunteer comments indicate appreciation for the project:
"I have done some surveys for different reasons on our beaches, but was impressed that a survey was being done all along Port Susan Bay."
"Overall, I thoroughly enjoyed participating in the project, and given available resources, believe it was well done!"

Conclusion

The Port Susan MSA Citizen Science Project was a success on all levels. High quality data was collected along 11.87 miles of shoreline on parameters that are needed for marine stewardship area planning; volunteers gained new insights and connections into Port Susan ecology; and a robust inventory of citizen science work over the past ten years was compiled. The data will be digitized and more analyses will be completed in 2012. Those analyses will be incorporated into the Port Susan Marine Stewardship Area Conservation Action Planning process. Additionally, there is volunteer interest to continue with surveys in 2012 and add to the dataset collected to date. There is a possibility that WSU Extension staff may be able to support this effort in the summer of 2012.

Sharing the results of the project with volunteers is important to raise overall volunteer satisfaction with the project and retain a body of volunteers available for future research

in Port Susan. To do this, staff will be invited to present findings with WSU Extension Beach Watchers in both Island and Snohomish Counties in spring 2012, as well as distributing a summary of this report and future data analyses through newsletters and email.

Lastly, the Port Susan MSA Citizen Science Project was the first collaboration between the Snohomish County Marine Resources Committee, Washington Sea Grant and WSU Extension Beach Watchers. This project gave each partner an opportunity to bring their organizational assets to the table and provide a very cost-efficient, effective project to fruition in a complex, dynamic planning landscape.

References

Brossard D, Lewenstein B and Bonney R. 2005. Scientific knowledge and attitude change: the impact of a citizen science project. Int J Sci Educ 27: 1099-1121.

Evans C, Abrams E, Reitsma R, Roux K, Salmonsen L, and Marra P. 2005. The neighborhood nestwatch program: participant outcomes of a citizen-science ecological research project. Cons Biol 19:589–594.

Appendix J: Conservation Strategic Actions to be Addressed in the Future

This Appendix contains the strategic actions included in the Port Susan MSA CAP Conservation Strategies section which are not anticipated to move forward within the next 1-3 years. Some of the strategic actions have listed action steps and indicators, but since they are on hold, these have not been assessed or discussed further with partners. We are including this information in the Appendix to act as a starting point for when these strategic actions do move forward in the future.

3.5.1. River Delta

Objective 1. Increase delta complexity of approximately 200 (+/-) acres between South Pass and Hat Slough and improve flood conveyance by creating a restoration project that increases freshwater inputs to the mudflats by 2020.

Strategic Actions

1. Develop agreements and incentives for landowners to redistribute flood water into new distributary channels on their land by 2015.
    a. Opportunity Rank: High

Note: *Strategic Action on hold pending further discussions with Snohomish County's Sustainable Lands Strategy. The following action steps will be revised based on future discussions.*

i. Action Steps:

1. Stillaguamish Watershed Council partners solicit interest from local delta landowners (particularly those who have known stormwater flooding issues).

2. Design and build appropriate (historic) distributary channels to convey flood water to 200(+/-) acres of mudflat by 2020.
    a. Opportunity Rank: High

Note: *Strategic Action on hold pending further discussions with Snohomish County's Sustainable Lands Strategy. The following action steps will be revised based on future discussions.*

i. Action Steps:

1. Lead entity finds sponsor for project and works with willing landowners to seek funding.
2. Possible funding source: Puget Sound Acquisition and Restoration (PSAR) funds.
3. Lead entity adds project to the three-year salmon recovery work plan.

Objective 2. Reduce the delivery of flood water to the whole delta area[11] to accommodate more productive agriculture that allows farmers to return a portion of their land to natural functioning

[11] Whole delta area refers to the entire delta area, which includes agriculture.

conditions (either buffer or marsh). Goals for marsh and buffers are consistent with salmon recovery plan of restoring a minimum of 315 acres of estuarine area by 2016[12].

Strategic Actions

1. City of Stanwood and Snohomish County solidify wetland protection, connection, and restoration components as part of stormwater retrofits in Comprehensive Plans by 2015, to create increased water storage in agricultural fields and decrease runoff.
    a. Opportunity Rank: High

Note: *Strategic Action on hold pending further discussions with City of Stanwood. The following action steps will be revised based on future discussions.*

i. Action Steps:

1. Set up a joint meeting between jurisdictions with authority over LID, including Snohomish County (CWD representative and LID expert), the Snohomish Conservation District, and City of Stanwood.
2. Snohomish County integrates LID work into the County's pathogen reduction grant.
3. Snohomish County integrates Port Susan water quality strategies into water quality facilities plan.
4. ~~4.~~ Puget Sound Partnership approaches elected officials in the City of Stanwood and Snohomish County to lobby for increased natural storage components in stormwater retrofits identified in the Comp Plan, to be consistent with the Action Agenda.
5. Puget Sound Partnership works with City of Stanwood and the Snohomish Conservation District to find funding sources for stormwater retrofit and wetland/storage projects.
6. Puget Sound Partnership works with Snohomish County and the Snohomish Conservation District to find funding sources for stormwater retrofit and wetland/storage projects.
7. WSU Snohomish County Extension Master Gardener's program provides information and training on LID and natural landscaping techniques in collaboration with the Snohomish Conservation District.

2. Retrofit Stanwood developments with low impact development (LID) techniques by 2020.
    a. Opportunity Rank: Medium

Note: *Strategic Action on hold pending further discussions with City of Stanwood. The following action steps will be revised based on future discussions.*

i. Action Steps:

[12] Restoration area subject to change based on updates to the salmon recovery plan.

1. Retrofit all priority pre-2005 DOE regulated commercial areas in Stanwood with appropriate LID techniques by 2020.
2. Retrofit all Stanwood public infrastructure and property with LID, and Snohomish Conservation District work with the City of Stanwood and Snohomish County SWM to identify opportunity for private facility retrofits.
3. WSU Snohomish County Extension Master Gardeners program provides information and training on LID and natural landscaping techniques in collaboration with the Snohomish Conservation District.

Objective 3. Work with farmers, researchers and marketers to develop profitable and environmentally sustainable opportunities to farm under the changing conditions in the Stillaguamish Delta.

Strategic Actions

1. Farm Link connects Snohomish Farm Incubator (farm hands-on training center, including classes on regulations and ecosystem process) graduates with Stillaguamish properties to encourage incoming farmers to promote stewardship and environmentally friendly productivity techniques.

   Identified Partners: WSU Extension

Note: *Strategic Action on hold pending funding for Farm Incubator program. Action steps will be developed based on future discussions.*

Indicator 1: Number of farmers who have participated in Farm Incubator farming in the Stillaguamish.

Method: Annual survey of graduates
Who: WSU Snohomish County Extension
When: Annually, during/after growing season
Cost: Depends – phone calls would be very low, site visits more costly
Comments: Use lessons learned and example of the Skagit Incubator Farm as a model.

Indicator 2: Number of farmers that participated in Farm Incubator farming who are using environmentally friendly farming techniques.

Method: Annual survey of graduates
Who: WSU Snohomish County Extension
When: Annually, during/after growing season
Cost: Depends – phone calls would be very low, site visits more costly

Objective 4. In areas that have degraded flood protection infrastructure, construct set back dikes that ensure that fields behind the setbacks will be better protected and return a portion of the

original property to tidal marsh in partnership with the Sustainable Lands Strategy (SLS), Stillaguamish River Flood Control District, and Stillaguamish Technical Advisory Group (STAG).

Strategic Actions

1. Evaluate areas with high salinity due to frequent tidally influenced river flooding.
    a. Opportunity Rank: None

Note: *Strategic Action on hold pending further discussions with Snohomish County's Sustainable Lands Strategy.*

2. Construct set back dikes that protect property.
    a. Opportunity Rank: None

Note: *Strategic Action on hold pending further discussions with Snohomish County's Sustainable Lands Strategy.*

3. Restore areas on the waterward side of the dike.
    a. Opportunity Rank: None

Note: *Strategic Action on hold pending further discussions with Snohomish County's Sustainable Lands Strategy.*

3.5.2 Chinook Salmon

Note: Available habitat is a key limiting factor for Chinook Salmon restorations. Chinook Salmon Habitat is also addressed within the Delta Strategies.

Objective 2. Encourage and/or maintain 90% of future growth in the lower Stillaguamish watershed within the Urban Growth Areas (UGAs) by 2020.

Strategic Actions

1. Address vesting laws on lands critical for salmon through sun-setting or other mechanism by 2015.
    a. Opportunity Rank: Low-Medium

Note: *Strategic Action on hold due to low-medium opportunity rank. The following action steps will be revised based on future discussions.*

i. Action Steps:

1. Puget Sound Partnership will advise legislators that vesting laws must be changed and will include it in the Action Agenda strategies update.
2. Puget Sound Partnership targets certain legislators to sponsor a bill to change vesting laws.

2. Re-visit grandfathered non-conforming lots on Ag-10 zoned lands.
    a. Opportunity Rank: None

Note: Strategic Action on hold. The following action steps will be revised based on future discussions.

4. Outside of the Urban Growth Area, limit future growth by making access to water utilities stricter by closing sensitive basins (where water rights are already over appropriated) to future exempt wells.
    a. Opportunity Rank: None

Note: *Strategic Action on hold. The following action steps will be revised based on future discussions.*

i. Action Steps:

1. Identifying potential sensitive basins.
2. Department of Ecology closes ecologically sensitive basins to further appropriations.

3.5.3 Beaches/Forage Fish

Objective 1. Protect 100% of remaining natural shoreline. Where instances of armoring are legally permissible under the single-family exemption in State law, encourage softshore armoring.

Strategic Actions

5. Change permit requirements to shift burden of proof from permitter to landowner to require a review process that includes onsite meetings by interested parties similar to forest resources process.
    a. Opportunity Rank: Low

Note: *Strategic Action on hold due to low opportunity rank. The following action steps will be revised based on future discussions.*

i. Action Steps:

1. Provide educational workshops for permitting authorities to verify knowledge of armoring impacts, and increase scrutiny when issuing permits for new or enhanced hard armoring.

Indicator 1: Permitting process changed.
Rank: Low

Method: Check all relevant permitting requirements (e.g., state, local jurisdictions?)
Who: Advisory Team
When: After attempt has been made to advance this strategy
Cost: Less than $100
Where: N/A
Timing & Frequency: Once
Who is responsible for analyzing, interpreting & reporting: N/A
What triggers decision making: No change in permitting requirements

3.5.5 Embedded Invertebrates

Objective 1. Improve health of eastern soft shell clam and sand shrimp populations.

Strategic Actions

1. Develop and institutionalize a Co-management Plan for Eastern soft shell clams with local data.
    a. Opportunity Rank: None

Note: *Strategic Action on hold. The following action steps will be revised based on future discussions.*

i. Action Steps

1. Develop a new funding source to augment and institutionalize population surveys.
2. Tulalip Tribes conduct ESS population surveys (and collate existing data)
3. Collect varnish clam data to assess their population and interaction with native species, such as the Eastern soft shell.
4. Conduct Port Susan shellfish suitability index analysis and produce shellfish stock report.
5. Adjust harvest levels to be sustainable, based on local data.
6. Evaluate sustainable harvest techniques.
7. Identify shellfish harvest potential and shellfish harvest stakeholders.

2. Develop and institutionalize a Co-management Plan for sand shrimp.
    a. Opportunity Rank: None

Note: *Strategic Action on hold. The following action steps will be revised based on future discussions.*

i. Action Steps:

1. Implement sand shrimp biomass surveys.
2. Evaluate sustainable harvest techniques.

3.5.6 Shorebirds

Objective 1. Maintain quality and quantity of mudflats and intertidal marsh by allowing habitat migration in the face of sea level rise (in perpetuity).

Strategic Actions

1. Set back dikes in delta areas with failing infrastructure to restore a portion of delta habitat (overall goal is a minimum of 315 acres by 2016) and offer increased protection to agricultural lands.

a. Opportunity Rank: Medium

Note: *Strategic Action on hold pending further discussions with Snohomish County's Sustainable Lands Strategy. The following action steps will be revised based on future discussions.*

i. Action Steps:

1. Port Susan MSA citizen science project identifies the amount of armoring that currently exists in Port Susan.
2. Canvas climate change modeling efforts to find out what work is being done in order to quantify what the change will be and how much work will need to be done.
    a. TNC
    b. Battelle
    c. Skagit River Cooperative
    d. Tulalip Tribes
3. Identify how much removal is necessary.
4. Identify candidate sites for removal.
5. Identify funding sources.

Appendix K: Technical Review of Workplan

Target	Obj/ SA/ AS #	Comments	Reviewer	Reviewer Organization
		A general comment is that Snohomish County just adopted a Shoreline Code in July of this year. This draft work plan may not properly reflect PDS priorities.	PDS	PDS
River Delta		It is unclear in this section if agriculture has bought into the plan, are these objective and strategic actions that they wanted to improve business or quality of life?	Curt Moulton	WSU Snohomish County Extension
River Delta	Obj 1	I'm unclear here; does the improved conveyance reduce flooding onto farms thereby improving their economic feasibility? If so, then this should be restated so the landowners better understand objectives and the purpose of the strategic actions.	Curt Moulton	WSU Snohomish County Extension
River Delta	Obj 1 SA 3	This sounds overly broad and it's not clear how it is tied to the increase of fresh water inputs to mudflats. I am the lead for Snohomish County's Water Quality Monitoring programs and this is the first I've heard of us monitoring water quality on built channels between South Pass and Hatt Slough. This objective, its strategic actions and actionable steps need additional thought in terms of monitoring water quality. What is the goal for WQ monitoring? What is the concern? Low dissolved oxygen, high bacteria? How to these relate to resources at risk? Aquatic life or human health? What are the questions to answer? Which parameters are of concern? What are the spatial and temporal scales of monitoring? What levels of change will be meaningful? What responses are expected due to apparent increases of delta complexity through implementation of Ag BMPs?	Steve Britsch	Snohomish County SWM

		Which Ag BMPs are expected to increase delta complexity?		
River Delta	Obj 1 SA 3 AS 3	Track Change: Snohomish Conservation District works with landowners who have water quality issues to develop and implement farm plans (BMPs).	Cindy Flint	SCD
River Delta	Obj 3	Is this something that the farmers from the Delta area thought would help them? 2. You may want to broaden this. If the farming conditions and methods are going to change with this plan, what is grown and raised may to have to change. New opportunities are created. May be this should read something like… Work with farmers, researchers and marketers to develop most profitable and sustainable opportunities to farm under the changes growing conditions coming to the Delta.	Curt Moulton	WSU Snohomish County Extension
River Delta	Obj 3	The local food movement seems to be fragmented and without leadership at present; much of the momentum has dissipated in the past year. It isn't clear who would do this.	Scott Chase	Island County Shore Stewards
River Delta	Obj 3	His comments centered on how most local farmers in the Stillaguamish delta are third and fourth generation farmers who have been supplying "local" produce for many decades, as well as shipping it elsewhere. He speculated that we would be hard pressed to find an organic or "slow foods" farmer who sells at the local farmers markets and who has been a farmer more than one generation, and are most likely to have taken up farming relatively recently. And that their farms are likely much smaller than those of the traditional farmers. He said that if we wanted to reach out to the larger, traditional farmers to adopt BMPs, we should avoid using "slow food" and organic in our language as a focal point, as this would be an immediate turn-off for generational farmers, and they would stop reading or listening as soon as they saw those terms. He was quite emphatic in saying how quickly they would tune us out and stop listening. This might be something to consider, and I'm sure Joe would be happy to share his knowledge.	Joe Hiller	Island Country MRC
River Delta	Obj 3	Work to get local foods in the Stanwood School District similar to the Arlington Farm to School program.	Bill Blake	City of Arlington
River Delta	Obj 3 SA 2	Political note for you: There's a divide on the County's Ag Advisory Board and Sustainable Lands	Tim Walls	Snohomish County

		Strategy and County ag staff between smaller-scale, “local food”, and larger producers. This issue may affect your efforts here. Larger producers have felt targeted (as evil) in the recent Focus on Farming Conference. They also own most of the land in the area you are trying to protect and/or restore. Local food tends to focus on smaller producers, who are not necessarily your target here. It may be something with this particular action and not seeing the bigger picture on my part, but it may prevent your ability to advance agricultural actions. Also, some of the ag producers in Port Susan are producing seed crop, which may, but often does not, “feed” the local food market, either for seed for local growers, or with the actual food production. Think about it and how the farmers in this area might support MSA objectives, or not.		
River Delta	Obj 3 SA 2 AS 2	I’m not familiar with the group. The resources of our ag program are limited. If this Center is a priority for Delta growers, then it is more likely we can fulfill this Action Step.	Curt Moulton	WSU Extension
Chinook Salmon		Arguably, the most significant challenge Chinook are facing today is habitat. But under the Chinook Salmon objectives in the workplan you're focusing mostly on water quality. The second objective relates to maintaining future growth within the UGA, however the UGA of Stanwood is some of the most important habitat Chinook have in the Stilly. It seems like you need another strategic action under that objective about conserving or restoring valuable habitat. Obviously, I understand that this is currently a very volatile topic, and may not be realistic for a 1-3 year workplan. Perhaps this is something best revisited in a year or so. I leave this up to you.	Gina Gray	Stillaguamish Tribe
Chinook Salmon	Obj 1	You are setting yourselves up for failure with such an aggressive objective. Further, I’d encourage the group to clearly identify the waterbody segments on the 303(d) list, i.e. impaired for nutrients but without a TMDL in place.	Steve Britsch	Snohomish County SWM
Chinook Salmon	Obj 1	I agree with Steve Britsch that this would be extremely difficult to do by 2015. It’s good to stretch and set difficult goals, but there’s also setting goals that are nearly impossible and set you up for failure. This one borders on the latter.	Tim Walls	Snohomish County

		One other thing that Steve did not raise in his comments is that for many parameters, the process for removal from the 303d list is still unclear. DOE addressed some issues from the TMDL work group (SC, KC, PC, some cities) raised where the removal process was not even developed at all. Gaps still remain. Talk with Steve about this issue for more detail. I'm not sure if nutrients and agrochemicals (which ones?) are still gaps, or not. Finally, one of the issues here is the time delay for ecosystem response to treatments. Some things, like stream temperatures, have a delay between the treatment and response. The same is true with some chemicals. You might consider that the timeline would better read full implementation of treatments by 2015, with a) prevention of further introductions and b) monitoring to ensure effectiveness of the treatments and ultimate removal of the 303d listing		
Chinook Salmon	Obj 1 SA 1	Track Change: Snohomish Conservation District promotes a comprehensive approach to land management for farm owners to include agriculture, habitats and water quality BMPs that incorporates education, grant funds, and other resources or partners to implement BMPs by 2015.	Cindy Flint	SCD
Chinook Salmon	Obj 1 SA1 AS 1	Under Chinook objective 1 in strategic action 1 and 2 you list "identify top five chemicals harmful to salmon" as your top action step. I had a brief conversation with our water quality specialist (Jody Brown) about this. He thought that this might be difficult to identify, because scientists may not agree readily on which five are the absolutely most harmful. Additionally, he said you might want to narrow this down, do you mean immediately harmful as in sudden death, or harmful as in accumulating over time etc? He also suggested that your five chemicals identified for strategic action 1 may not be the same as those identified for strategic action 2, as in the chemicals that are most attributed to ag areas may not be the same as those most attributed to urban areas. Also that landscaping chemicals might not be the most harmful chemicals in urban areas, but rather the	Gina Gray	Stillaguamish Tribe

		bioaccumulation of heavy metals such as copper from brake pads (which incidentally are being phased out beginning in January 2013). So I think my take home message here is that you might want this action step to include a workshop or science panel to determine which chemicals you want to concentrate on, and get the input from a wide variety of technical professionals to determine if you can get those folks to agree on a primary list. It might be a little more complicated than originally thought to make this identification.		
Chinook Salmon	Obj 1 SA 1 AS 2	Is it just agrochemicals? What's on the 303d list? Note, many of the pre-spawning mortality issues are unrelated to 303d listings, which is why they are a problem.	Tim Walls	Snohomish County
Chinook Salmon	Obj 1 SA 1 AS 4	Track Change: Host Community meetings to discuss community vision.	Cindy Flint	SCD
Chinook Salmon	Obj 1 SA 1 AS 5	Track Change: Secure funding to create additional cost share and technical assistance	Cindy Flint	SCD
Chinook Salmon	Obj 1 SA 1 AS 5	Developing funding will take more than 2 years to accomplish. You need a longer timeline. Are you really saying you will create a new pot of money for this work, or will you better utilize existing pots?	Tim Walls	Snohomish County
Chinook Salmon	Obj 1 SA 1 AS 7	I'm not sure I follow the goals of this action. To what end? Of course, they will advise, but why would they want to, and what would it influence? Where is it on their priority list? Does the Board currently have regular check-ins with the SCD on farm project priorities? I don't know that they do on a formal basis…	Tim Walls	Snohomish County
Chinook Salmon	Obj 1 SA 2	You could add WSU Snohomish County Extension and the Snohomish Conservation District to identified partners. Both are partners with Snohomish County SWM in presenting the Natural Yard Care program.	Curt Moulton	WSU Snohomish County Extension
Chinook Salmon	Obj 1 SA 2	Replace "any" with "priority".	Steve Britsch	Snohomish County SWM
Chinook Salmon	Obj 1 SA 2	Insert "Snohomish County/ Camano Island" before ECO Net, here and in other inclusions	Scott Chase	Island County Shore Stewards
Chinook Salmon	Obj 1 SA 2	Insert "Snohomish County/ Camano Island" before ECO Net.	Chrys Bertolotto	WSU Snohomish County Extension
Chinook Salmon	Obj 1 SA 2	Add Snohomish Conservation District to list of identified partners.	Monte Marti	SCD

Chinook Salmon	Obj 1 SA 2	Should we include the Noxious Weeds Control Boards for both counties, as that is their purpose is?	Scott Chase	Island County Shore Stewards
Chinook Salmon	Obj 1 SA 2 AS 2	Add Snohomish Conservation District.	Monte Marti	SCD
Chinook Salmon	Obj 1 SA 2 AS 4	Always use full title "WSU Snohomish County Extension" in this type of document. Please change throughout document.	Chrys Bertolotto	WSU Snohomish County Extension
Chinook Salmon	Obj 1 SA 2 AS 5	New Action Step added: The County's Natural Yard Care program team focuses resources on the residential areas covered by the Plan.	Curt Moulton	WSU Extension
Chinook Salmon	Obj 1 SA 2 AS 7	WSU Island County Extension has a waste wise program that involves volunteers in waste disposal issues on Camano and Whidbey Islands. Scott Chase will have details on this project.	Chrys Bertolotto	WSU Snohomish County Extension
Chinook Salmon	Obj 1 SA 2 AS 7	Seek funding for a Stillaguamish based annual Hazardous waste round-up.	Bill Blake	City of Arlington
Chinook Salmon	Obj 1 SA 2 AS 9	WSU Beach Watchers in Island County have begun a Mussel Watch program. Contact their coordinator, Barbara Bennett, for details	Scott Chase	Island County Shore Stewards
Chinook Salmon	Obj 1 SA 2 AS 12	If this is aimed at farming then add WSU Snohomish County Extension agriculture program as a partner.	Curt Moulton	WSU Snohomish County Extension
Chinook Salmon	Obj 1 SA 2 AS 13	New Action Step added: Snohomish County SWM and Snohomish Conservation District incorporate message and strategies into youth education programs.	Monte Marti	SCD
Chinook Salmon	Obj 1 SA 2 AS 14	New Action Step added: Snohomish County SWM, WSU Extension, and Snohomish Conservation District seek funding to develop outreach strategies and training packages for landscape professionals	Monte Marti	SCD
Chinook Salmon	Obj 1 SA 3	Add Snohomish Conservation District to identified partners.	Monte Marti	SCD
Chinook Salmon	Obj 1 SA 3	This document lists WSU Extension, Shore Stewards, and Master Gardeners as one entity covering both counties, and involved in the activities in the action steps above. Though the programs in each county are involved, their duties and involvement differ by county.	Scott Chase	Island County Shore Stewards
Chinook Salmon	Obj 1 SA 3 AS 1	Add Snohomish Conservation District to Action Steps 1-4.	Monte Marti	SCD
Chinook Salmon	Obj 1 SA 3	Replace "Welcome Wagon packets" with "Port Susan Owner's Manual".	Chrys Bertolotto	WSU Snohomish

	AS 2			County Extension
Chinook Salmon	Obj 1 SA 3 AS 5	New Action Step added: ECO Net, Snohomish County Surface Water Management, and WSU Snohomish County Extension seek funding opportunities to support the activities above.	Curt Moulton	WSU Snohomish County Extension
Chinook Salmon	Obj 1 SA 3 AS 5	Where is the Strategic Action for "working with Snohomish County and DOE to clearly define water pollution codes, interpretations, and enforcement roles to ensure compliance"?	Cindy Flint	SCD
Chinook Salmon	Obj 2	I'm not seeing the connection betwixt Objective 2 and Strategic Action 3. What's the link? It may be there, but I'm not seeing it specifically here.	Tim Walls	Snohomish County
Chinook Salmon	Obj 2 SA 3	This sounds very comprehensive and my understanding is that it's only a forest protection strategy.	Cindy Flint	SCD
Chinook Salmon	Obj 2 SA 3	Specifically, how does creation of an ecosystem services incentive program maintain growth in the UGAs? How does this incentive address barriers to protecting or restoring lands? I also have concerns about precedents set with this particular action. It needs a lot more discussion and fleshing out before I would advance some of the uses of ecosystem services advocated here. It's not that it's a bad idea, just that we really need to proceed cautiously with such new types of programs, and attempt to evaluate potential unintended consequences.	Tim Walls	Snohomish County
Chinook Salmon	Obj 2 SA 3	What about Snohomish County Planning and Development Services for identified partners? SWM does not regulate land use.	Steve Britsch	Snohomish County SWM
Chinook Salmon	Obj 2 SA 3	Action Steps: Maybe add TDRs in this section?	Bill Blake	City of Arlington
Chinook Salmon	Obj 2 SA 3 AS 1	CPI has no direct relationship with ecosystem services. What is your conservation priority? Are you targeting a "payoff" to protect lands where ecosystem services on lands are high, or ones where they are low?	Tim Walls	Snohomish County
Chinook Salmon	Obj 2 SA 3 AS 2	Need to identify PDS in that role as they are the permitting agency.	Bill Blake	City of Arlington
Chinook Salmon	Obj 2 SA 3 AS 2	Need to identify other things first. What targets? Target high or low ES valued lands? What medium will you use for this incentive – SWM fee structure, or will it be something else?	Tim Walls	Snohomish County

Beaches/ Forage Fish	Obj 1 SA 1	Identified Partners: What is the strategy to increase SnoCo's enforcement effort by 2020? This needs to be discussed with PDS and this objective needs to be vetted with leadership.	PDS	PDS
Beaches/ Forage Fish	Obj 1 SA 1 AS 2	Wow, great idea. This task looks really big to me and seems to call for a more considered approach, such that it incorporates the entire chain from demand for bulkheads (are they even necessary?), to who supplies them, to permitting them, to finished product. This task seems more a program in itself.	Tim Walls	Snohomish County
Beaches/ Forage Fish	Obj 1 SA 2	Opportunity rank: Why is this listed as None? The Island Co. SMP update includes some softshore standards that should be adopted by the end of Dec. 2012.	Karen Stewart	Island County SMP
Beaches/ Forage Fish	Obj 1 SA 2 AS 1	In the restoration guidelines, or where?	Tim Walls	Snohomish County
Beaches/ Forage Fish	Obj 1 SA 2 AS 2	Code generally does not get into this level of detail. There are exceptions, so I may be wrong. However, I see the system as: 1) Code is developed by the county. 2) Policies are developed to implement the code, which is where this level of detail is normally outlined. 3) Practices, which involve what permitting staff use to guide their work, as well as what the county might do themselves, such as at Kayak Point.	Tim Walls	Snohomish County
Beaches/ Forage Fish	Obj 1 SA 2 AS 2	The comprehensive update of Snohomish County's Shoreline Management Program (SMP) was approved by Ecology on July 13, 2012, and became effective July 27, 2012. General regulations applicable to shoreline habitat restoration, enhancement and bank stabilization projects are contained within these new codes. Specific amendments need to be proposed where additional standards or techniques are desired.	PDS	Snohomish County PDS
Beaches/ Forage Fish	Obj 1 SA 2 AS 3	New Action Step added: MRC develop proposal to amend Snohomish County shoreline codes. MRC to work with Snohomish County PDS to evaluate proposal and present proposal to the county council.	PDS	Snohomish County PDS
Beaches/ Forage Fish	Obj 1 SA 3	This one bothers me a bit, but it may be a context issue – what about the no action alternative? Do they really need armoring to begin with?	Tim Walls	Snohomish County

Beaches/ Forage Fish	Obj 1 SA 3	Identified Partners: Stillaguamish Watershed Council is not a partner here?	Tim Walls	Snohomish County
Beaches/ Forage Fish	Obj 1 SA 3	Identified Partners: Add Island County	Karen Stewart	Island County SMP
Beaches/ Forage Fish	Obj 1 SA 3	This was the comment that did not get resolved in the conversation with the core team, myself and Curt. Our office consistently facilitates public education programs targeted at landowners (and other groups), with the ECO Net grant being just one example. I do not know a better way to write this, but calling at the MRCs as the only facilitators is inaccurate.	Chrys Bertolotto	WSU Snohomish County Extension
Beaches/ Forage Fish	Obj 1 SA 3	I agree with Chrys. You may want WSU and UW to lead with guidance and funding through NW Straits and MRCs	Curt Moulton	WSU Snohomish County Extension
Beaches/ Forage Fish	Obj 1 SA 3	Action Steps: I'm struggling with the scale of the actions here. I would first look at what areas are bulkheaded, then what areas might change to soft-shore armoring, and what areas are at risk of erosion?	Tim Walls	Snohomish County
Beaches/ Forage Fish	Obj 1 SA 3 AS 1	I suggest working with the Sustainable Develop Task Force. It is a long standing group that works with developers and builders to use green building techniques and get them properly permitted. Talk with Lisa Dulude.	Curt Moulton	WSU Snohomish County Extension
Beaches/ Forage Fish	Obj 1 SA 3 AS 3	Collaboration with PDS will be necessary to ensure alignment with new codes and formatting with other assistance bulletins.	PDS	Snohomish County PDS
Beaches/ Forage Fish	Obj 1 SA 3 AS 4	An effective training can be organized by any of the partners as long as the presenters are qualified, remove the line "with training given by a licensed coastal geologist "from the action step.	Chrys Bertolotto	WSU Snohomish County Extension
Beaches/ Forage Fish	Obj 1 SA 4	Is this a code change? You might consider how hard it might be to get such a change in place. Explore how it might be done outside of a code change, but it may end up as the "best" place for it… in which case, you might start building acceptance now for softshore armoring over hard… (political pressure/backing to change in the future, because softshore is the "norm")	Tim Walls	Snohomish County
Beaches/ Forage Fish	Obj 1 SA 5	New Strategic Action added: Evaluate Snohomish County permitting requirements to determine if standards	PDS	Snohomish County PDS

		for new or enhanced hard armoring are adequate.		
Beaches/ Forage Fish	Obj 1 SA 4	Identified Partners: Based on difficulty within the salmon world about dealing with WDFW on salmon recovery issues related to the HPA approval process. You can see me for details. Also, you might want to include DNR on this one.	Tim Walls	Snohomish County
Beaches/ Forage Fish	Obj 1 SA 4 AS 1	Insert “Island County”.	PDS	Snohomish County PDS
Beaches/ Forage Fish	Obj 1 SA 4 AS 2	New Action Step added: Evaluate Snohomish County permitting standards for bulkheads	PDS	Snohomish County PDS
Beaches/ Forage Fish	Obj 1 SA 4	Barriers should be identified to denote those that involve Snohomish County PDS.	PDS	Snohomish County PDS
Beaches/ Forage Fish	Obj 1 SA 4 AS 5	Track Change: Confirm that WSFW design standards for bulkheads are included in recently adopted codes.	PDS	Snohomish County PDS
Beaches/ Forage Fish	Obj 2 SA 1 AS 1	Replace “restoring buffers” with “riparian restoration”.	Cindy Flint	SCD
Beaches/ Forage Fish	Obj 2 SA 1 AS 2	Track Change: WSU Snohomish County Extension to conduct formative research on barriers and motivators of small lot landowners near water to engage willing landowners and increase long-term success. Comment: We have been requested to put in a full proposal on this that looks 95% guaranteed.	Chrys Bertolotto	WSU Snohomish County Extension
Beaches/ Forage Fish	Obj 2 SA 1 AS 6	Not sure what this is? We want to start a pilot project to provide free trees if we get funding but haven’t worked with Shore Stewards on this.	Cindy Flint	SCD
Beaches/ Forage Fish	Obj 2 SA 1 AS 6	This is for shorelines. Do we have a similar action step for streamside?	Monte Marti	SCD
Beaches/ Forage Fish	Obj 2 SA 1 AS 7	Don’t understand why this is here and other riparian buffer stuff is above. Should this be combined with the pilot project for free trees?	Cindy Flint	SCD
Beaches/ Forage Fish	Obj 2 SA 1 AS 7	Yes, and streamside landowners.	Monte Marti	SCD
Beaches/ Forage Fish	Obj 2 SA 1 AS 7	Consider a more general statement to include Island County.	Karen Stewart	Island County SWP
Beaches/ Forage Fish	Obj 2 SA 1 AS 7	Track Change: Work with Scott Moore (Snohomish County Native Plants Steward) and Sound Salmon Solutions to explore plant donations to landowners who are interested in restoring buffers on	Chrys Bertolotto	WSU Snohomish County Extension

		their properties. Comment: Robert Sendry has conveyed that this may be an option related to the grant I mentioned in comment 7)		
Beaches/ Forage Fish	Obj 2 SA 2	This process is very political. Do you have a strategy for how you will bring it about? Just providing data won't cut it for this one; you will need a very deliberate strategy for how to move forward. Another aspect to consider is DOE's review and how you might influence that.	Tim Walls	Snohomish County
Beaches/ Forage Fish	Obj 2 SA 2	A better verb would be "amends" than "institutes ". We should consider revising 2020 to 2014 because the new SMP should be effective by then and it has new regulations and incentives.	Karen Stewart	Island County SMP
Beaches/ Forage Fish	Obj 2 SA 3	What is the expectation for PDS on this? Has it been identified as a PDS priority by management? Has it been vetted with the county council in terms of what PDS can commit to?	PDS	Snohomish County PDS
Beaches/ Forage Fish	Obj 2 SA 3 AS 2	Replace "WSU Extension Shore Stewards" with "WSU Snohomish County Extension".	Chrys Bertolotto	WSU Snohomish County Extension
Dungeness Crab	Obj 1 SA 1	Consider the audiences and the number of messages. They are probably different, but you might want to be conscious of overlapping audiences and what's happening. Just think about it. Also, with this work plan, do you have enough staffing for all of these programs? Each social marketing piece that you are calling for is a lot of work. I'm concerned about quality versus quantity… Maybe a lot of the work is already done and can advance easily…	Tim Walls	Snohomish County
Dungeness Crab	Obj 1 SA 1 AS 1	I reversed the order of Snohomish County MRC and WSU Extension as a large majority of the education work on this is done by Extension, and will likely continue to be that way. We do not work with tribal fishers and defer to tribal shellfish staff to do so.	Chrys Bertolotto	WSU Snohomish County Extension
Dungeness Crab	Obj 1 SA 2	What's the barrier to enforcement? It's probably number of staff and $ in the budget. How will you get past that? Also, what actions can WDFW take? You might consider that they don't generally prosecute (only won 1 HPA violation case in 20 years), so what would you have them do?	Tim Walls	Snohomish County
Dungeness	Obj 1	Track Change: MRCs work with Puget	Chrys	WSU

Crab	SA 3 AS 4	Sound Partnership to change State law allowing the sale of pots that do not meet state gear rules.	Bertolotto	Snohomish County Extension
Embedded Invertebrates	Obj 3 SA 1	The state has been very involved in the removal of spartina over the years.	Scott Chase	Island County Shore Stewards
Shorebirds		Is this a backyard habitat opportunity? SCD can provide help and support for work with private landowners.	Monte Marti	SCD
Shorebirds	Obj 1 SA 2 AS 2	Please change the wording to "Assist with the implementation of applicable recommendations resulting from the analysis". The word assisting will hopefully help keep us out of hot water.	Gina Gray	Stillaguamish Tribe
Shorebirds	Obj 2 SA 1	Who is going to pay for orchestrating response, and training necessary to meet minimum Emergency Response Requirements found in WAC 296-824-100? There are issues of liability when asking anyone, especially volunteers to be trained and respond to hazardous materials spills. Coordinated spill response efforts require the State geographic response plan incorporate local law enforcement, department of emergency management, E911 office, public works and other local agencies as necessary. This is a massive undertaking. Snohomish County sends many of its' employees who may respond to spills to Argus Pacific (Seattle) to receive Hazardous Waste Operations and Emergency Response Training to the levels necessary for the job task. It cost's As written, it is unclear what role each agency, or set of volunteers would play in the event of a spill. The role played dictates the levels of training required and the costs. Anyone expected to respond and take an offensive role in uncontrolled releases (technician level) of hazardous substances requires a minimum 24hrs of training ($450) with annual 8hr refreshers. ($180) I encourage the team to review WAC 296-824-100 and speak with the Washington State Department of Labor and Industries and/or Department of Ecology prior to attempting to undertake this objective.	Steve Britsch	Snohomish County SWM